## 6.2 Biophysical VECs

### 6.2.1 Terrestrial Habitats and Vegetation

Terrestrial habitats and vegetation were selected as VECs because they are valued in their relationship with species at risk, migratory birds and bats and other biological and physical components. The LAA for terrestrial habitats and vegetation included a 50 m corridor on either side of roads required to access turbine sites during construction and operation and along powerline corridors; and 150 m around turbine bases, substations and ancillary equipment, as shown on **Figure 8**.

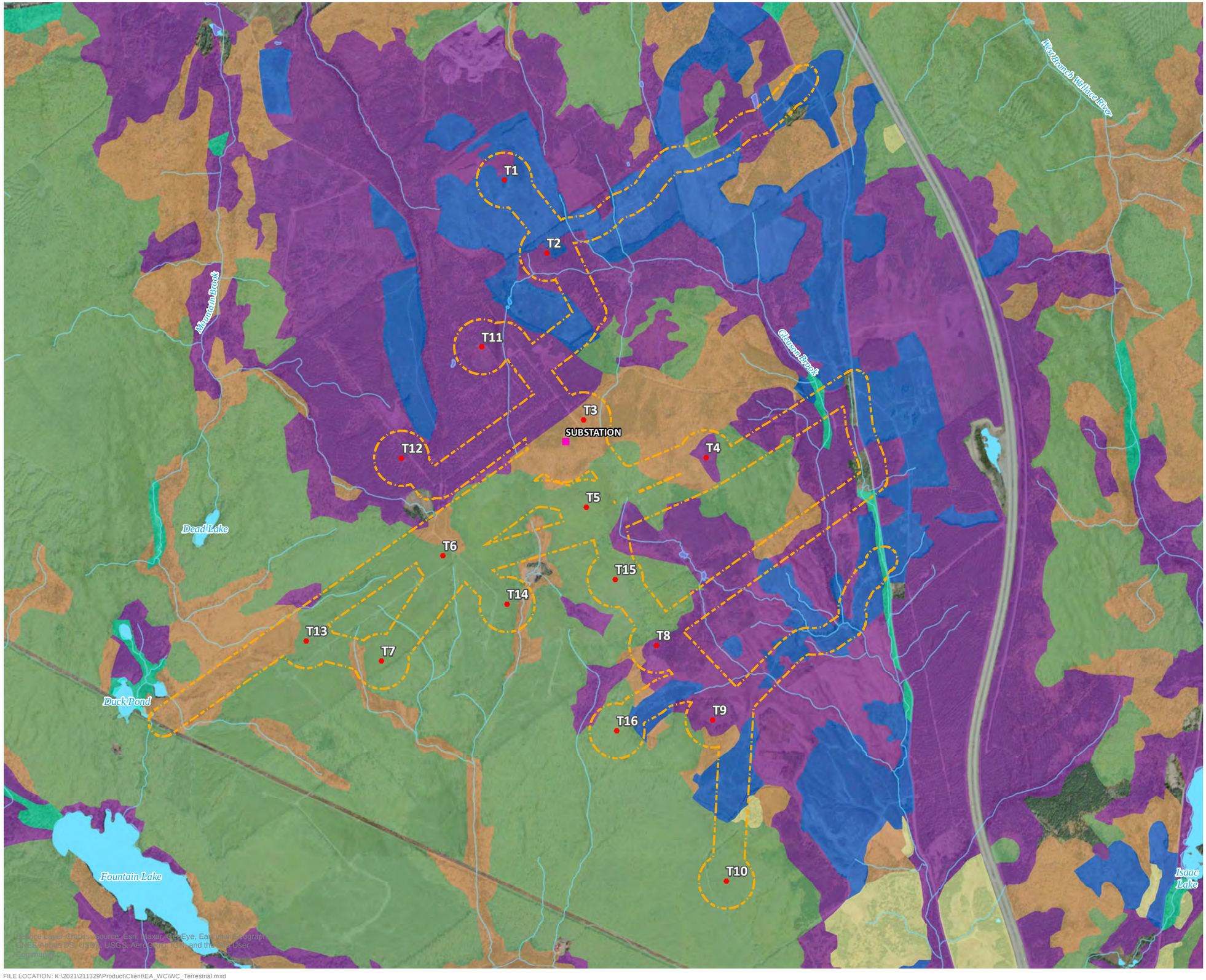
As previously discussed, the Project is located in the greater ecological region known as the Nova Scotia Uplands – Cobequid Hills ecodistrict (Unit 340) (Neily et al. 2017). This ecodistrict is characterized as late successional Acadian shade tolerant hardwood forests (Neily et al. 2017). At higher elevations within this ecodistrict, such as those within the proposed PDA, softwood stands occur on moist, level terrain, with shade tolerant mixed-wood forests found along steep-sided ravines (Neily et al. 2017). Locally, the site consists of only one ecoelement; the Tolerant Hardwood Hills ecoelement, (NSDLF 2019). Sugar maple, yellow birch, and beech are the most common species of this ecoelement and have the greatest growth potential on the well-drained, rich, sheltered lower slopes. It should be noted that beginning in the early 1800s, large areas of tolerant hardwood forests were cleared for farmland in the Cobequid Hills (CRM 2022, **Appendix N**). Where this farmland has been abandoned, fields naturally reforested to stands of white spruce. However, much of this old field forest has since been harvested and converted to wild blueberry production or re-planted with softwood species (Neily et. al. 2017).

Accordingly, a high level desktop assessment of terrestrial habitats and vegetation, which was completed for the LAA to identify potential environmental constraints, identified the major terrestrial habitat types that align with the site's ecoelement and anthropogenic history. The major terrestrial habitat types identified in the LAA for the Terrestrial Environment included: hardwood-dominated forest, mixed-wood and managed sugar-bush forests, conifer dominated forests and managed plantations, blueberry fields, recently cleared areas, and wetlands. These habitat types were identified based on the results of the desktop and field surveys. These habitats are shown on **Figure 8**. Surveys of these habitat types were completed during the 2021 growing season by experienced plant identification specialists. Details of the assessment methodology and findings are presented in **Appendix E**.

The general vegetation within the habitat type is described as follows:

<u>Hardwood-dominated Forest</u>

Hardwood forests are characterized by temperate trees and understory flora, high species richness, diverse stand structures and by generally rich and well drained soils (NSDFL 2021). The hardwood forest habitat encountered during the 2021 vegetation surveys was dominated by maples and included a diverse understory of mostly herbaceous plants. No vegetation SAR or SoCC were identified within the hardwood-dominant forests. Several plants that are known to be of cultural significance to the Mi'kmaq were identified within assessed areas of hardwood forest habitat and are listed below in **Section 6.2.1.2**.






Natural Forces

WESTCHESTER WIND PROJECT

# HABITATS WITHIN THE TERRESTRIAL LOCAL ASSESSMENT AREA

FIGURE 8

- Proposed Turbine Location
- Substation
- Local Assessment Area
- Watercourse
- Waterbody

**Habitat (DNR Forest Inventory 2021)**

- Conifer - Dominant Forest
- Mixed - Wood Forest (incuding managed sugarbush forest)
- Hardwood - Dominant Forest
- Recently Cut Area
- Blueberry Field
- Wetland

0 0.25 0.5 1 km

N W E S

SCALE 1:20,000

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

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

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-02-03

FILE LOCATION: K:\2021\211329\Product\Client\EA_WC\WC_Terrestrial.mxd

Dominant vegetation within the hardwood dominated forest habitats of the terrestrial LAA included:

- A diverse herbaceous understory with ferns, flowering plants (e.g., asters, lilies) sedges and ferns; and,
- Hardwood trees such as maples (i.e., red, striped, sugar and mountain), American beech, and paper and yellow birch.

Mixed-wood and Managed Sugar-bush Forests

Mixed wood forests are tree dominated landscapes that contain both coniferous and deciduous trees (NSDLF 2021a). Within this habitat were areas being used as a managed sugar-bush forest. Sugar-bush forest are manicured forested landscapes that are dominated by Sugar maple trees (*Acer saccharum*) and, where there is active sap collection (i.e. a network of tapped trees and associated tubing). No vegetation SAR or SoCC were identified within the mix-wood forests during the 2021 surveys. Several plant species that are known to be of cultural significance to the Mi'kmaq were identified within the mixed-wood and sugar bush forest habitat within the assessed area and are listed below in **Section 6.2.1.2**.

Dominant vegetation within mixed-wood and managed sugar-bush forest habitat of the terrestrial LAA included:

- An over story canopy dominated by sugar maple, but with occasional American beech and yellow birch dotted amongst;
- A dense understory consisting mostly of striped maple, hobblebush and mountain maple (in areas where there isn't a network of sap collection tubing); and
- A relatively sparse herbaceous layer consisting mostly of common ferns, sedges and a few hardy flowering forbs.

Conifer-dominated Forests and Managed Conifer Plantations

Conifer-dominant forests are common in areas previously disturbed by fire or windthrow (NSDFL 2021), or, in the case of this site, forestry activities. A typical spruce and pine forest in Nova Scotia consists of an overstory of black spruce and pines (white, red, jack), a shrub layer dominated by ericaceous species (i.e., lambkill, blueberry and huckleberry), along with black spruce regeneration, and a herb cover may be present but is dependent on the amount of light reaching the ground (NSDFL 2021). Managed Conifer plantations typically consist of only 1 or 2 species of native or non-native conifers, often planted in linear rows, and usually of one age class. These plantations generally lack any deciduous understory as they are routinely treated with a herbicide to remove competition from the planted conifers. Understory plants found in this habitat type tend to be hardy, fast-growing, pioneer species capable of seeding and growing in between applications of herbicide. No vegetation SAR or SoCC were identified within this habitat type during the 2021 field and vegetation surveys. Several culturally significant plants were identified and are listed below in **Section 6.2.1.2**.

Dominant vegetation observed within conifer-dominated forests and plantations included the following:

- Conifer trees (e.g., Red and Norway spruce);
- Woody shrubs (e.g., blueberry, smooth service berry); and,
- Depending on the presence of open spaces and time since last herbicide application, some locations had an understory of fern, grasses and asters, and other hardy flowering plants (i.e., northern starflower, wild sarsaparilla).

Fields, Clear Curs and Disturbed Areas

This category includes managed blueberry fields, abandoned pastures, road sides and other cleared or recently regenerating habitat. Plant species growing in disturbed areas are variable dependant on the landscape and level of disturbance and a list of species observed is included in Appendix E.

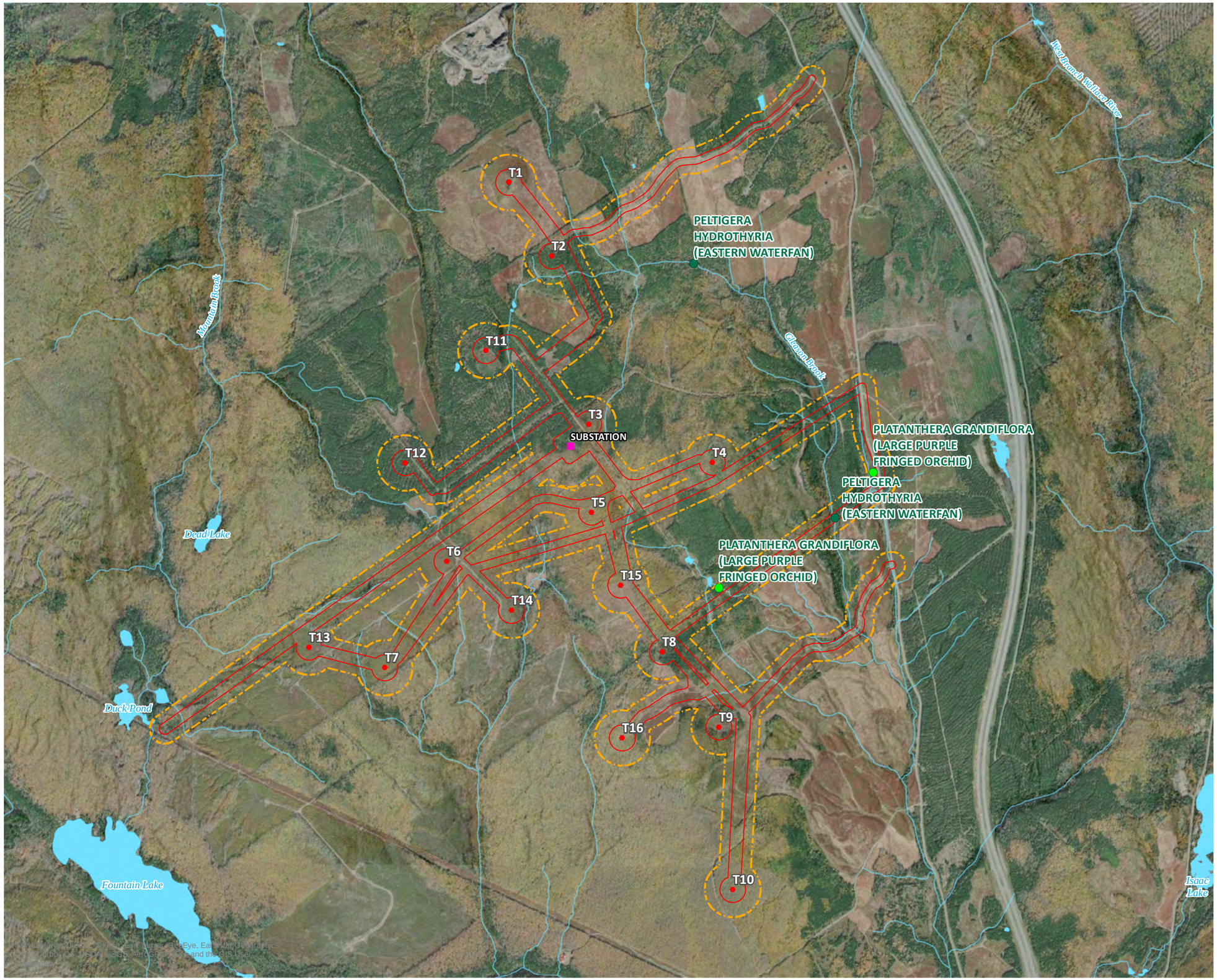
In addition, several plants that are considered to be exotic were identified within disturbed habitats. The majority of the exotic species are weeds and common in Nova Scotia in disturbed areas and along road sides. No vegetation SAR or SoCC were identified within disturbed areas within the assessed areas during the 2021 field surveys. Several culturally significant plants were identified within disturbed habitat and are listed below in **Section 6.2.1.2**.

Wetlands

Swamps and fens were the main classes of wetland identified within the LAA. Swamps are wetland types with mineral soils and are not typically dominated by peatlands (NSE 2021). Swamp vegetation is often dominated by trees and shrubs, but also contain grasses, sedges ferns and rushes in open areas. Fens typically consist of peatlands saturated with water. Vegetation of fens is more diverse than in bogs and generally consists of sedges and mosses and shrubby trees (NSE 2021). Eastern waterfan (*Peltigera hydrothyria*) is an aquatic lichen SAR and was observed at two locations along Gleason Brook near wetlands in 2021. One plant SoCC was observed within two swamps in the LAA (i.e., large purple fringed orchid). Large purple fringed orchid (*Platanthera grandiflora*) is ranked by the ACCDC as S3 for vulnerable in Nova Scotia. Details on SAR and SoCC flora are discussed in the next section and in **Section 6.2.7** and the locations where they were observed are shown on **Figure 9**. Several culturally significant plants were identified within the hardwood forest habitat and are listed below in **Section 6.2.1.2**.

Dominant vegetation within wetlands included the following:

- Woody shrubs (including speckled alder, mountain holly, Canada yew, rhodora and creeping snowberry and red raspberry);
- Herbaceous plants (including white meadow sweet, asters grasses, Virginia St. John's-wort, and several ferns, grasses and sedges); and,
- Trees (when present) included conifers (i.e., white spruce, and Balsam fir) and hardwood trees (e.g., red maple and yellow birch).




Natural Forces

WESTCHESTER WIND PROJECT

## VEGETATION WITHIN THE TERRESTRIAL LOCAL ASSESSMENT AREA

FIGURE 9

- Potential Turbine Location
- Substation
- Project Development Area
- Local Assessment Area
- Watercourse
- Waterbody

**Plant Observation**

- Species at Risk
- Species of Conservation Concern

0 0.25 0.5 1 km

SCALE 1:20,000

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

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

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PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-02-03

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#### 6.2.1.1 Vegetation SAR and SoCC

During the 2021 field season, one lichen SAR and one vascular plant SoCC were identified incidentally during biological field surveys. Eastern waterfan (*Peltigera hydrothyria*) is an aquatic lichen that is listed as Threatened under SARA, COSEWIC and NSESA, in addition, it is ranked S1 by the Atlantic Canada Conservation Data Centre (ACCDC) for imperiled in Nova Scotia. Large purple fringed orchid (*Platanthera grandiflora*) which is ranked by the ACCDC as S3 for vulnerable in Nova Scotia was identified at two locations within wetlands in the LAA.

Eastern waterfan was observed within Gleason Brook in 2021 in one location within the LAA (**Figure 9**). A second observation of this lichen was observed further upstream and outside of the LAA incidentally during a turtle survey. In both instances, the lichen was growing on rocks within the brook.

Large purple fringed orchids were observed in July 2021 at two locations within the LAA during the wetland field assessments. Approximately 12 plants were observed in a wetland adjacent to Westchester Road and a tributary to Gleason Brook. One additional plant was observed in Wetland 9 (WL-9) which is also adjacent to a tributary to Gleason Brook.

#### 6.2.1.2 Assessment of Culturally Significant Vegetation

Some of the above-listed plants are recognized to be traditional Mi'kmaw medicinal plants or culturally significant plants. A list of culturally important vegetation for the Mi'kmaq that had the potential to be located in the Project area was prepared by a terrestrial biologist from Maqamigew Anqotumeg. The list was established following a desktop analysis of the site and overview of the habitat types located within the Project area. The plants identified during the 2021 vegetation surveys were cross referenced with the list of culturally important vegetation. The list of culturally significant plants with the potential to occur in the area is included in **Appendix E**. A list of the flora considered to be of cultural significance to the Mi'kmaq that was identified across the Project site is presented in **Table 12**.

**TABLE 12. CULTURALLY SIGNIFICANT FLORA TO THE MI'KMAQ OBSERVED**

| Plant Name | Mi'kmaq Name | Habitats Observed within the LAA |
|---|---|---|
| Alleghaney blackberry (Rubus allegheniensis) | Ajioqjimanaqsi (blackberry) | • Edges of Blueberry fields or other disturbed areas<br>• Wetlands |
| American beech (Fagus grandifolia) | Suomusi | • Hardwood-dominant forest<br>• Conifer-dominant forest/plantation<br>• Mixed-wood and sugar-bush forest |
| American mountain ash (Sorbus americana) | Epsimusi | • Blueberry field or other disturbed areas<br>• Conifer-dominant forest |
| Beaked hazlenut (Corylus cornuta) | Mlipkanjmusi | • Hardwood-dominant forest<br>• Wetlands |
| Choke cherry (*Prunus virginiana*) | Elwimanaqsi | • Wetlands |
| Common elderberry (Sambucus Canadensis) | Pukulu'skwimanaqsi (elderberry) | • Wetlands |
| Common plantain | Wijikanipkl | • Blueberry field or other disturbed areas |

| Plant Name | Mi'kmaq Name | Habitats Observed within the LAA |
|---|---|---|
| (Plantago major) | | |
| Creeping snowberry (Gaultheria hispidula) | Kna'ji'j | • Wetlands |
| Dwarf red raspberry (Rubus pubescens) | Katomin | • Hardwood-dominant forest<br>• Wetlands |
| Eastern white pine (Pinus strobus) | Kuow | • Blueberry field or other disturbed areas |
| Late lowbush blueberry (Vaccinium angustifolium) | Pkwiman (blueberry) | • Blueberry field or other disturbed areas<br>• Conifer-dominant forest/plantation<br>• Wetlands |
| Northern wild raisin (Viburnum nudum) | Skinaqanmusi | • Wetlands |
| Pearly everlasting (Anaphalis margaritacea) | Wapwasuek | • Blueberry field or other disturbed areas<br>• Conifer-dominant forest/plantation |
| Pin cherry (Prunus pensylvanica) | Maskwe'simanaqsi | • Blueberry field or other disturbed areas<br>• Conifer-dominant forest<br>• Mixed-wood and sugar-bush forest |
| Red clover (*Trifolium pretense*) | N/A | • Blueberry field or other disturbed areas |
| Red elderberry (Sambucus racemosa) | Pukulu'skwimanaqsi (elderberry) | • Blueberry field or other disturbed areas |
| Red raspberry (Rubus idaeus) | Klitaw | • Blueberry field or other disturbed areas<br>• Wetlands |
| Red spruce (Picea rubens) | Mekwe'k kawatkw | • Blueberry field or other disturbed areas<br>• Conifer-dominant forest/plantation<br>• Hardwood-dominant forest |
| Sheep laurel (Kalmia angustifolia) | N/A | • Conifer-dominant forest/plantation |
| Skunk currant (Ribes glandulosum) | N/A | • Blueberry field or other disturbed areas<br>• Hardwood-dominant forest<br>• Wetlands |
| Striped maple (Acer pensylvanicum) | Wapoq | • Blueberry field or other disturbed areas<br>• Hardwood-dominant forest<br>• Mixed-wood and sugar-bush forest |
| Sugar maple (Acer saccharum) | Snaweyey | • Blueberry field or other disturbed areas<br>• Conifer-dominant forest/plantation<br>• Hardwood-dominant forest<br>• Mixed-wood and sugar-bush forest |
| Sweet-fern (Comptonia peregrina) | N/A | • Blueberry field or other disturbed areas |
| Velvet-leaved blueberry (Vaccinium myrtilloides) | Pkwiman (blueberry) | • Blueberry field or other disturbed areas<br>• Conifer-dominant forest |

| Plant Name | Mi'kmaq Name | Habitats Observed within the LAA |
|---|---|---|
| Wild sarsaparilla (Aralia nudicaulis) | Wopapa'kjukal | • Blueberry field or other disturbed areas<br>• Conifer-dominant forest/plantation<br>• Hardwood-dominant forest<br>• Sugar-bush forest |
| Wild strawberry (Fragaria virginiana) | Atuomkominaqsi | • Conifer-dominant forest/plantation<br>• Hardwood-dominant forest<br>• Wetlands |
| Yellow birch (Betula alleghaniensis) | Nimnoqn | • Blueberry field or other disturbed areas<br>• Conifer-dominant forest/plantation<br>• Hardwood-dominant forest<br>• Wetlands<br>• Mixed-wood and sugar-bush forest |

### 6.2.2 Wildlife

The majority of the proposed Project is located within an area that has been used for agriculture and forestry activities. The majority of the site is dominated by cultivated blueberry fields. Nevertheless, some areas within the proposed Project footprint still extend through several less disturbed habitat types, including areas of relatively mature maple syrup operations, wetlands and watercourses.

A total of seven mammal species, three amphibian species and one terrestrial reptile species were identified within the assessment area during terrestrial field studies conducted by Dillon in 2021. Incidental observances made during the other field programs including; direct observations (i.e., sightings) and/or indirect evidence (e.g., scat, tracks, bones, and browse) of any wildlife species encountered were also documented. Targeted searches of wetland and pond habitats, when encountered, were conducted for reptiles and amphibians in conjunction with the wetland surveys.

A list of recorded observations of wildlife from the 2021 surveys (excluding bats, birds and turtles) are presented in **Appendix F**.

The mammal species observed or detected include:

- American Beaver (Castor canadensis);
- American Black Bear (Ursus americanus);
- Eastern Coyote (Canis latrans);
- Red Fox (Vulpes vulpes);
- Snowshoe Hare (Lepus americanus)
- Northern Raccoon (Procyon lotor); and,
- White-tailed Deer (Odocoileus virginianus).

Reptiles and amphibian species observed, or detected, include:

- Wood Frog (Lithobates sylvaticus);
- Green Frog (Lithobates clamitans);
- Pickerel Frog (Lithobates palustris); and,
- Common Garter Snake (Thamnophis sirtalis).

The encountered wildlife species listed above have populations in Nova Scotia that are considered secure according to the ACCDC (2021).

#### *6.2.2.1* Mainland Moose

Mainland moose have complex spatial and temporal habitat requirements that include a mosaic of woodland and wetland habitat types that provide food, shelter, and appropriate thermal regulatory conditions (NSDNRR 2021). While Westchester 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.

A Pellet Group Inventory (PGI) survey was developed to obtain baseline information on the potential presence of mainland moose within the proposed Project area. PGI surveys use ungulate fecal pellet groups (scat) as a source of proxy data to assess the population of a species in a given area. As Eastern Mainland Moose are known to consume upwards of 20 kg of plant material each day, each individual can then deposit up to 13-21 pellet groups per day. Using this defecation rate, a PGI survey seeks to approximate the number of moose within the area based on number of fecal pellet groups detected and the level of survey effort.

Based on the results of a desktop search, eastern mainland moose have been reported historically in the vicinity of the proposed Project. The project location is within a Mainland Moose Concentration Area (NSDNR 2012a). A summary of the ACCDC report for species at risk within the Project area, and within 5 and 100 km of the Project area, is attached. According to the ACCDC report (**Appendix L**), moose have been reported on 145 occasions within 7.3 km of the project location.

No signs of moose (i.e., antler sheds, rubbings, tracks, browse, sightings and/or pellets) were identified during the 2021 moose surveys or incidentally during other field surveys conducted in 2021 within the Project LAA. Light browse, shed antler and deer pellets were observed in each transect; however, it was deemed associated with White-tailed Deer based on other evidence such as tracks and trails.

The Proponent has contacted the Confederacy of Mainland Mi'kmaq 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 specifies 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).

### 6.2.3 Wetlands

Wetlands in Nova Scotia are defined by the *Environment Act* as land that is either periodically or permanently has a water table at, near or above the land's surface, or that is saturated with water; and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation, and biological activities adapted to wet conditions. This includes lands commonly referred to as marshes,

swamps, fens, and bogs, each of which has unique ecological conditions (NSE 2019). Other characteristics of wetlands include water at or near the surface, that is less than 2 m deep, little to no current, flora and fauna that thrive in wet environments, and rich mineral soils or peat, formed where water saturates or floods the surface (NSE 2019).

Wetlands were assessed as a biophysical VEC because they perform many important ecological, social, and economic functions and services in landscapes (NSE 2019). Wetlands are important to maintaining the health of watersheds by moderating floods, reducing the rate of runoff, and minimizing sedimentation and erosion (NSE 2019). Other important functions of wetlands include:

- Buffering storm water runoff, and supporting natural drainage patterns;
- Sequestration and storage of atmospheric carbon;
- Supporting the production of peat and natural foods;
- Filtering organic waste, bacteria, excess nutrients, contaminants, and silt from water;
- Providing critical habitat for fish, wildlife, and plants, including Species at Risk (includes globally significant coastal plain flora in Nova Scotia);
- Protecting the coastline from storm surges;
- Storing and releasing surface water and recharging groundwater, thereby contributing to drinking water supply;
- Supporting medicinal and ceremonial plants important Mi'kmaq bands in Nova Scotia; and,
- Supporting abundance and diverse plant communities which release essential food web nutrients after decomposition (NSE 2019).

In addition to performing the above important landscape functions, wetland ecosystems are typically some of the most productive ecosystems encountered in Nova Scotia. As such, in Nova Scotia (and elsewhere), many other VECs (e.g., SAR and SoCC, migratory birds and culturally significant flora and fauna) are hosted within wetland ecosystems. Loss or degradation of wetlands results in a loss or decrease in their ability to perform their ecosystem services and functions, and a reduction in biodiversity (NSE 2019).

Nova Scotia's wetlands have been given specific protection pursuant to the Nova Scotia *Environment Act* and the *Environmental Goals and Sustainable Prosperity Act*, which are enforced by Nova Scotia Environment and Climate Change. NSECC requires a permit for any wetland alteration greater than 100 $m^2$ in area (NSE 2019). Wetlands often support rare or uncommon vegetation species assemblages, and the *Nova Scotia Wetland Conservation Policy* and regulatory processes are guided towards the goal of achieving no net loss of wetland function (NSE 2019). Wetland compensation for alterations of a delineated wetland is often required as a condition of a wetland alteration permit when a net loss of wetland function occurs.

**Table 13** summarizes the wetlands assessed during the 2021 field season. Detailed methods and results are presented in **Appendix G.** Based on the preliminary proposed Project layout that was used for the EA assessment, 17 wetlands were assessed within the LAA, shown on **Figure 10**. Approximately 2.5 ha of

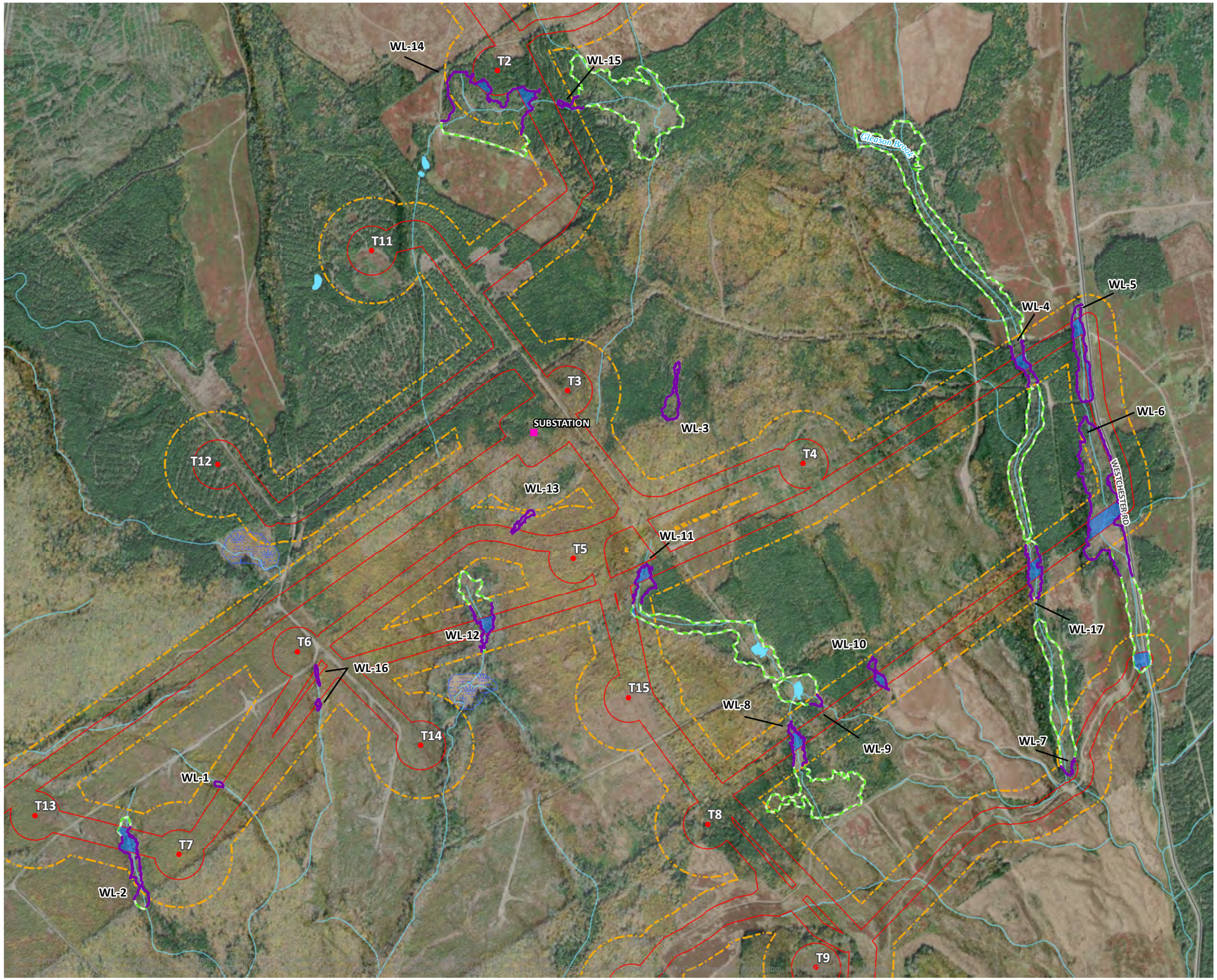
the preliminary PDA is classified as wetland The current proposed PDA (i.e., the assessment of 16 WTG locations with the intention of developing up to 12 WTG locations) was developed after 2021 growing season. The assessment of wetlands within areas of the current LAA that were beyond the LAA of the previously proposed Project layout have been assessed via desktop using predictive mapping of potential wet areas. Based on predictive mapping, proposed new access roads are anticipated to directly impact one potentially wet area and come within 30 m of a second potentially wet area. It is estimated that an additional 3 wetlands (approximately 1.72 ha) are potentially within the LAA**.**

**TABLE 13. SUMMARY OF WETLAND DATA COLLECTED AS PART OF THE WETLAND ASSESSMENT FOR THE WESTCHESTER WIND PROJECT.**

| Wetland | Date Delineated | Wetland Class | Approximate Area in the PDA (ha) | Approximate Total Area (ha) |
|---|---|---|---|---|
| Wetland 1 | 14 July 2021 | Wet Meadow | 0.004 | 0.03 |
| Wetland 2 | 14 July 2021 | Treed Swamp | 0.26 | 0.72 |
| Wetland 3 | 14 July 2021 | Fen | 0 | 0.34 |
| Wetland 4 | 15 July 2021 | Shrub Swamp | 0.13 | 5.57 |
| Wetland 5 | 15 July 2021 | Shrub Swamp | 0.30 | 0.84 |
| Wetland 6 | 15 July 2021 | Fen/Shrub Swamp | 0.76 | 4.50 |
| Wetland 7 | 19 July 2021 | Shrub Swamp | 0.002 | 1.78 |
| Wetland 8 | 19 July 2021 | Fen | 0.14 | 2.43 |
| Wetland 9 | 19 July 2021 | Fen/Shrub Swamp | 0 | 0.84 |
| Wetland 10 | 19 July 2021 | Wet Meadow | 0.09 | 0.15 |
| Wetland 11 | 19 July 2021 | Fen/Shrub Swamp | 0.16 | 2.50 |
| Wetland 12 | 19 July 2021 | Treed Swamp | 0.16 | 0.89 |
| Wetland 13 | 19 July 2021 | Treed Swamp | 0.01 | 0.10 |
| Wetland 14 | 19 July 2021 | Shrub Swamp | 0.28 | 3.67 |
| Wetland 15 | 19 July 2021 | Fen/Shrub Swamp | 0 | 4.06 |
| Wetland 16 | 30 September 2021 | Wet Meadow/Treed Swamp | 0.02 | 0.06 |
| Wetland 17 | 25 August 2021 | Shrub Swamp | 0.19 | 0.51 |
| Total | | | **2.51** | **28.99** |

**Notes:**

Wetland class was determined based on the principles of the Canadian Wetland Classification System (National Wetlands Working Group 1997) and the *Nova Scotia Wetland Conservation Policy* (NSE 2019).

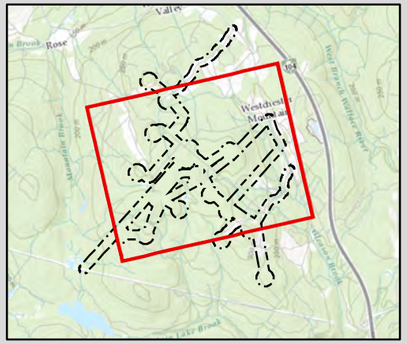



Natural Forces

WESTCHESTER WIND PROJECT

# WETLANDS WITHIN THE TERRESTRIAL LOCAL ASSESSMENT AREA

- Proposed Turbine Location
- Substation
- Project Development Area
- Local Assessment Area
- Preliminary Field Delineated Wetland
- Model Interpreted Wetland Boundary
- Wetland and Project Development Area Intersection
- Watercourse
- Waterbody
- Wetland




0 0.125 0.25 0.5 km

SCALE 1:10,500

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

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

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-02-04

FILE LOCATION: K:\2021\211329\Product\Client\EA_WC\WC_Terrestrial_Wetland.mxd

The proposed WTG locations are not predicted to directly interact with any identified wetlands as none were delineated within the proposed footprint of these structures; however, as currently designed, Wetland 14 will be directly impacted by proposed access road construction. Wetlands 1 and 13 are not anticipated to be directly impacted by road construction, although work is proposed within 30 m of their delineated boundaries. There are also new access roads proposed to be built through one of the unassessed wetlands, and within 30 m of a second unassessed wetland (to be assessed in the 2022 field season. During construction of the collector network, care will be taken to avoid wetlands, and all attempts will be made to span wetlands with poles; however, 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).

NSECC's mitigation sequence is a hierarchical progression of alternatives laid out to achieve wetland conservation. As described in the *Nova Scotia Wetland Conservation Policy*, monitoring and an adaptive approach are essential for the following three sequence stages to ensure net loss is prevented

a) *Avoidance* of adverse effects;

b) *Minimization* of unavoidable adverse effects; and

c) *Compensation* for adverse effects that cannot be avoided (NSE 2019).

The goals of this policy are taken in to account in the continuous planning of the Project in conjunction with all other site considerations.

### 6.2.4 Birds and Bird Habitat

Nova Scotia is an important migration pathway for birds due to the extensive coastline and abundance of important bird habitats such as mud flats; therefore bird assemblages can vary greatly across seasons and between regions. Several factors that influence the diversity and abundance of birds in Nova Scotia include habitat factors, geography and seasonality (i.e., the timing of important annual events including migration and breeding) (Davis and Browne 1996).

Many bird species in Nova Scotia have protection under both provincial and federal legislation. Most bird species are protected under the federal Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22), which prohibits the killing of a migratory bird as well as the disturbance, destruction, and taking of a migratory bird egg or nest without a permit from Environment Canada. Birds of prey and upland game birds, meanwhile, are not protected under the Migratory Birds Convention Act but instead have similar protection under the provincial Wildlife Act (R.S.N.S.1989, c. 504).

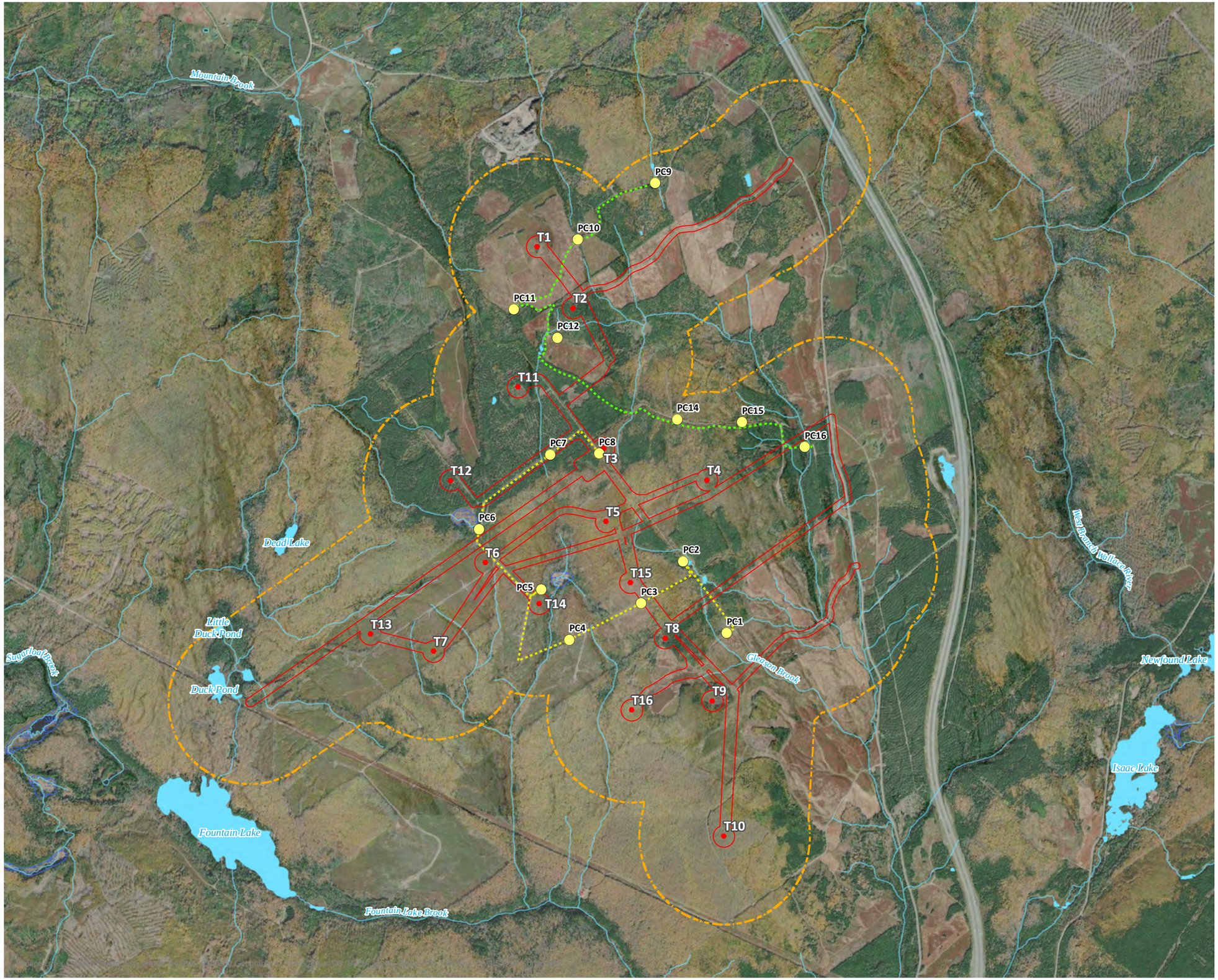
In Canada, important bird habitats are recognized by the Important Bird and Biodiversity Areas Program. This program aims to conserve, and monitor a network of sites that provide essential habitat for Canada's bird populations (IBA Canada 2022).The nearest designated Important Bird Area (IBA), to the PDA, Cobequid Bay (NS019) is located approximately 15 kilometres to the south. This IBA is approximately 480 $km^2$ and is located within the eastern arm of the Bay of Fundy. The area consists of intertidal habitats including mudflats, sandflats and salt marshes that provide foraging opportunities for migrating shorebirds. Between 1 and 2 million shorebirds use the mud flats of the head of the Bay of

Fundy (in this and other adjacent IBAs) in the fall for staging before the southern migration (IBA Canada 2022).

As such, a study design was proposed and discussed with the Nova Scotia Department of Natural Resources and Renewables biologists prior to being implemented with consideration for the ecological setting of the site and the nearby important bird habitat. The study included field surveys for breeding birds, migratory birds and resident bird populations with strategic timing designed to match breeding and migratory windows specific for the region.

A bird survey, commissioned by the Proponent, was conducted at the Project location in 2011 (Strum 2013). The results of the surveys previously conducted are discussed herein in relation to the findings of the 2021 surveys conducted as part of this environmental assessment.

Bird surveys were conducted throughout four seasons in 2021 within the LAA for birds (i.e., 500 m buffer around all Project components, including the PDA). Bird survey locations are shown on **Figure 11**. The locations for the survey transects and point counts were selected as a mechanism to capture the representative terrain and habitat types within the LAA. Details of the survey methodology, analysis and results are presented in **Appendix H**.

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## SURVEY LOCATIONS AND LOCAL ASSESSMENT AREA FOR BIRDS

FIGURE 11A

- Proposed Turbine Location
- Point Count Location
- Transect 1
- Transect 2
- Project Development Area
- Local Assessment Area
- Watercourse
- Waterbody
- Wetland

0 0.25 0.5 1 km

N W E S

SCALE 1:24,000

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

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

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PROJECT: 21-1329
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FILE LOCATION: K:\2021\211329\Product\Client\EA_WC\WC_Terrestrial_BirdTransect.mxd


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WESTCHESTER WIND PROJECT

## SURVEY LOCATIONS AND LOCAL ASSESSMENT AREA FOR BIRDS

FIGURE 11B

- Proposed Turbine Location
- Project Development Area
- Local Assessment Area
- Watercourse
- Waterbody
- Wetland

**Winter Area Search**

- February 25, 2020 (5.4 km)
- February 26, 2020 (5.85 km)
- March 12, 2020 (6.44 km)
- March 13, 2020 (7.37 km)

0 0.125 0.25 0.5 km

N W E S

SCALE 1:14,000

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

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MAP CHECKED BY: KB
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PROJECT: 21-1329
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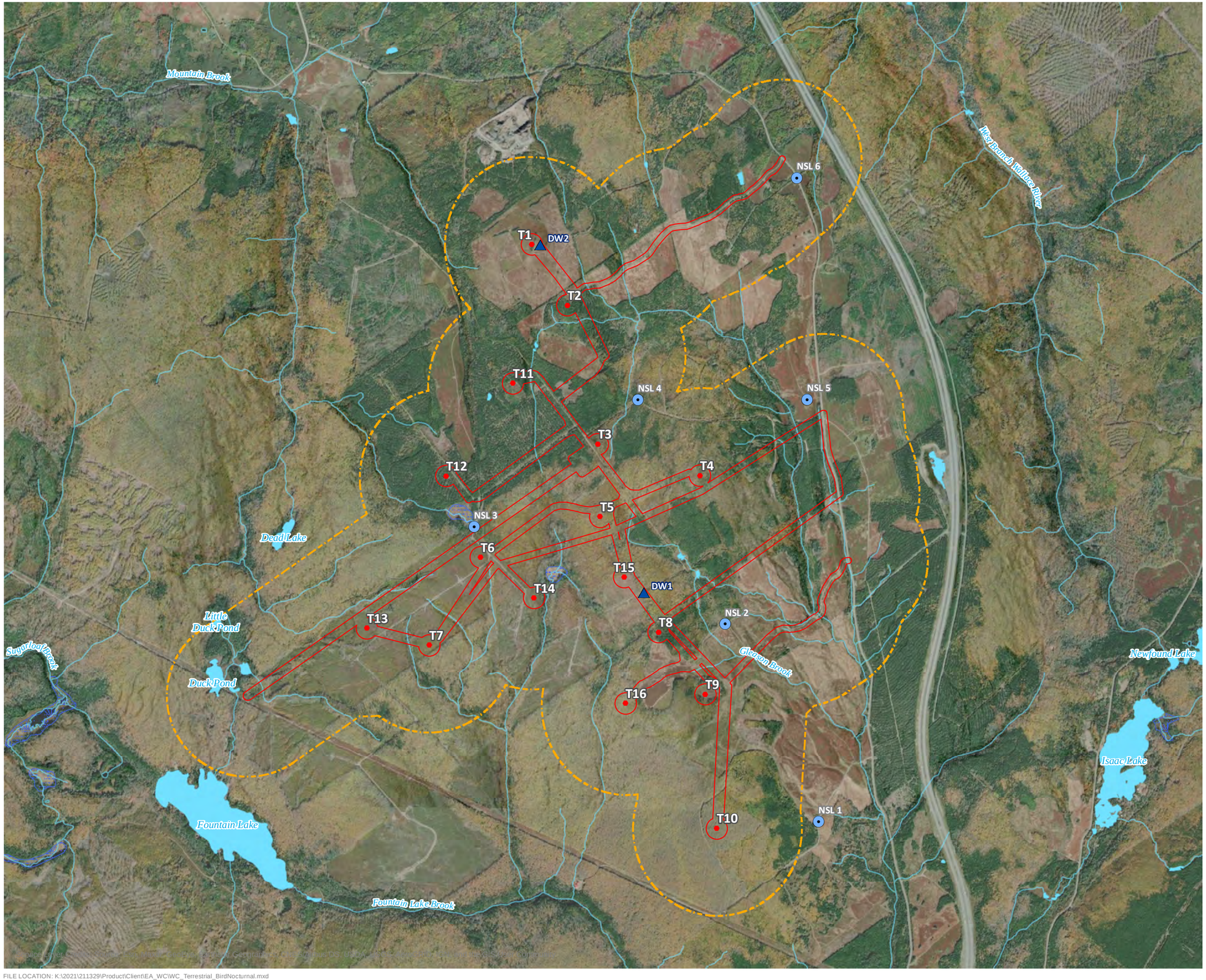


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## SURVEY LOCATIONS AND LOCAL ASSESSMENT AREA FOR BIRDS

FIGURE 11C

- Proposed Turbine Location
- Diurnal Watch Location
- Nocturnal Survey Location
- Project Development Area
- Local Assessment Area
- Watercourse
- Waterbody
- Wetland

0 0.25 0.5 1 km

N W E S

SCALE 1:24,000

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

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

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-02-11

FILE LOCATION: K:\2021\211329\Product\Client\EA_WC\WC_Terrestrial_BirdNocturnal.mxd

**Table 14** summarizes the habitat at each point count location. The methodology and results of the field surveys that were conducted in 2021 are detailed in **Appendix H**.

**TABLE 14 HABITAT AT SURVEY LOCATIONS WITHIN THE LAA**

| Point Count Location | Primary Habitat | Secondary Habitat(s) |
|---|---|---|
| PC1 | Wetland (Swamp) | Blueberry Field, Mixed-wood Forest |
| PC2 | Wetland (Fen) | Conifer plantation (mature), Mixed-wood Forest |
| PC3 | Cleared area (Clear cut) | Mixed-wood Forest |
| PC4 | Conifer plantation (immature) | Mixed-wood Forest (riparian buffer) |
| PC5 | Conifer plantation (immature) | Mixed-wood Forest (riparian buffer), Wetland (Fen) |
| PC6 | Mixed-wood Forest | Wetland (Fen), Conifer plantation (immature) |
| PC7 | Conifer Plantation (mature) | n/a |
| PC8 | Hardwood Forest | Conifer plantation (mature) |
| PC9 | Mixed-wood Forest | Hardwood Forest |
| PC10 | Cleared Area (fields) | Blueberry Field, Softwood Forest |
| PC11 | Softwood Forest | Blueberry Field |
| PC12 | Wetland (Swamp) | Blueberry Field, Softwood Forest |
| PC13 | Hardwood Forest | n/a |
| PC14 | Hardwood Forest | Mixed-wood Forest |
| PC15 | Hardwood Forest | Mixed-wood Forest |
| PC16 | Wetland (Swamp) | Conifer plantation (mature) |

During the 2021 bird surveys, over 3400 individual birds of over 80 different species were recorded within the LAA. The bird populations present in the assessment area were observed through the techniques of point counts, area searches/transects, and diurnal watch counts. A summary of the total number of species and individual birds by season is presented below in **Table 15**.

### TABLE 15: NUMBER OF BIRD SPECIES AND INDIVIDUAL BIRDS DETECTED 2021 FIELD SURVEYS

| Season | Methods | Number of Species Observed (Diversity) | Number of Birds Detected (Abundance) |
|---|---|---|---|
| Late-Winter Surveys (April) | • Area Searches | 13 | 92 |
| Spring Surveys (April to June) | • Transect-based Point Counts;<br>• Diurnal Watch Counts;<br>• Breeding Nocturnal Owl Survey; and<br>• Observed Incidentally between Surveys. | 70 | 1502 |
| Summer Surveys (June to late July) | • Transect-based Point Counts;<br>• Observed Incidentally between Surveys; and,<br>• Breeding Common Nighthawk Survey. | 56 | 584 |
| Fall Surveys (mid-August to late-October) | • Transect-based Point Counts;<br>• Diurnal Watch Counts; and<br>• Observed Incidentally between Surveys. | 64 | 1286 |

Bird species diversity was assessed based on the number of bird species observed per day per survey transect. Species diversity is shown on **Figure 12** for transect-based point count surveys conducted during the winter, spring, summer and fall seasons in 2021. The highest bird diversity was observed during the end of the spring and the beginning of the fall migration periods (i.e., mid-May and late-August, respectively). The peaks of the migration also corresponded with the beginning and end of the nesting period (i.e., mid-April to late-August) in the birding zone of the LAA (i.e., Nesting zone C3) (ECCC 2018). Low bird diversity was observed during the winter field surveys, overall only 13 species were observed between February 25 and March 13, 2021 and between 5 and 9 species were observed per survey transect per day.

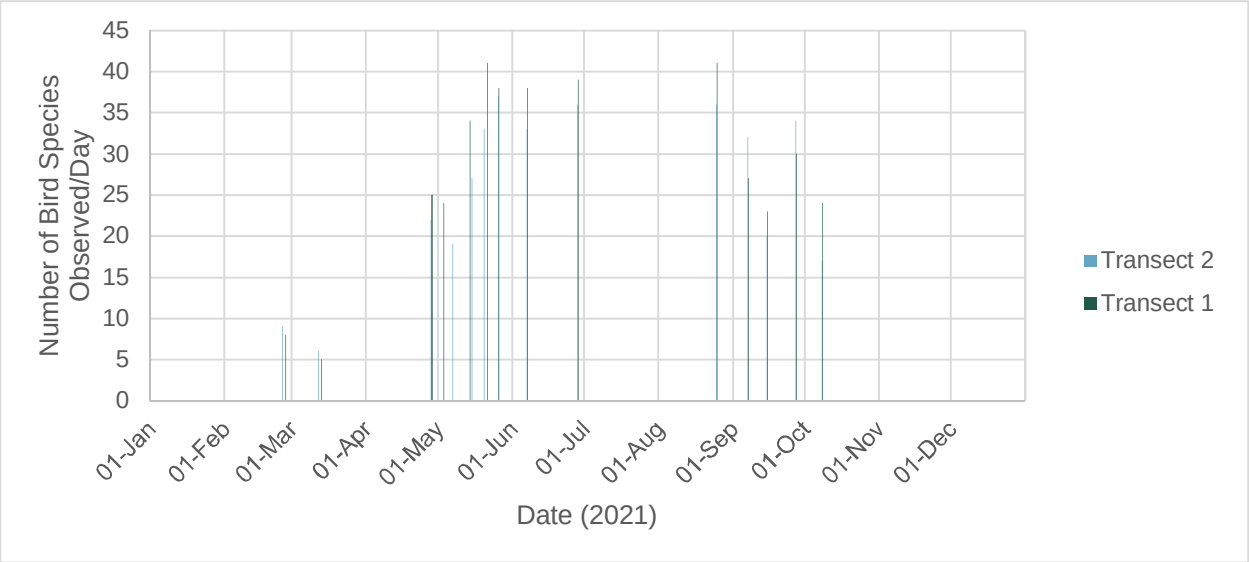


**FIGURE 12 NUMBER OF BIRD SPECIES OBSERVED PER DAY OBSERVED IN 2021**

During the 2021 bird surveys, 3 SAR and 14 SoCC species were detected, which are summarized below in **Table 16**, which also includes provincial rarity rankings by the ACCDC (S-ranks) and the season in which they were detected. For bird SAR, any listed status under SARA, COSEWIC and NSESA is included in the table below. In addition, one bird SAR (i.e., eastern wood-pewee) and several bird SoCC (i.e., Long-eared Owl, Pine Siskin, Pine Grosbeak, Rose-breasted Grosbeak, Tennessee Warbler, Vesper Sparrow and Yellow-bellied Flycatcher) were detected during the 2012 bird surveys and not during 2021. Further information on bird SAR that were detected during the survey program, including and their preferential habitat is provided further in **Section 6.2.7**, which speaks specifically of the Species at Risk.

**TABLE 16: BIRD SAR AND SOCC IDENTIFIED WITHIN THE ASSESSMENT AREA DURING THE 2021 SURVEYS**

| Common Name | Scientific Name | Status | ACCDC S-RANK* | Detected in 2012 | 2021 Season Species Detected In | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Winter | Spring | Summer | Fall |
| Species At Risk | | | | | | | | |
| Evening Grosbeak | Coccothraustes vespertinus | SARA: SC COSEWIC: SC NSESA: V | S3S4B,S3N | Yes | - | X | X | - |
| Canada Warbler | Cardellina canadensis | SARA: T COSEWIC: SC NSESA: E | S3B | Yes | - | X | - | X |
| Common Nighthawk | Chordeiles minor | SARA: T COSEWIC: SC NSESA: T | S2B | No | - | - | X | - |

| Common Name | Scientific Name | Status | ACCDC S-RANK* | Detected in 2012 | 2021 Season Species Detected In | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Winter | Spring | Summer | Fall |
| Species of Conservation Concern | | | | | | | | |
| American Kestrel | Falco sparverius | | S3B | No | - | X | X | X |
| American Robin | Turdus migratorius | | S5B, S3N | Yes | - | X | note[1] | X |
| Bay-breasted Warbler | Setophaga castanea | | S3S4B | Yes | - | X | X | X |
| Blackpoll Warbler | Setophaga striata | | S3S4B | Yes | - | X | - | X |
| Boreal Chickadee | Poecile hudsonicus | | S3 | Yes | X | X | X | X |
| Canada Jay | Perisoreus canadensis | | S3 | No | - | X | X | X |
| Cape May Warbler | Setophaga tigrina | | S2B | Yes | - | X | X | X |
| Northern Harrier | Circus hudsonius | NAR | S3S4B | Yes | - | X | X | X |
| Purple Finch | Haemorhous purpureus | | S4S5B,S3S4N | Yes | - | X | X | X |
| Red-breasted Nuthatch | Sitta canadensis | | S3 | Yes | X | X | X | X |
| Red Crossbill | Loxia curvirostra | | S3S4 | No | - | - | X | X |
| Ruby-crowned Kinglet | Regulus calendula | | S3S4B | Yes | - | X | X | X |
| Swainson's Thrush | Catharus ustulatus | | S3S4B | Yes | - | X | X | - |
| Turkey Vulture | Cathartes aura | | S2S3B | No | - | | X | - - |

Notes: Notes: Legal protection status refers to the protection status under the *Species at Risk Act* (SARA) and the *Nova Scotia Endangered Species at Risk Act* (NSESA) as of December 2021.

Special Concern (SC), Vulnerable (V), Threatened (T), Endangered (E), Not at Risk (NAR)

*S-Ranks as of December 2021

1. American Robins observed during the summer months are assumed to belong to the breeding population which is ranked as Secure by the ACCDC (i.e., S5B) and were not counted as a SoCC.

#### *6.2.4.1* Winter Survey Summary

Overwintering bird species were surveyed using transect-based area searches over the course of four days in the winter of 2021; February 25-26 and March 12-13. For each survey, a unique transect was surveyed by snowshoe in an attempt to maximize site coverage. These transects ranged from 3.5-4.5 km

in length. The methods, including the details of the transect locations and results are presented in **Appendix H** and on **Figure 11**.

During the winter birding surveys in 2021, 92 resident birds were observed and 13 resident bird species were identified. Of the 13 resident bird species, zero bird SAR and two bird SoCC were detected (i.e., Red-breasted Nuthatch (*Sitta canadensis*) and Boreal Chickadee (*Poecile hudsonicus*)). As illustrated in **Figure 13**, most of the birds observed during the winter survey program are regarded as having a 'secure' or 'apparently secure' populations within Nova Scotia (i.e., with an ACCDC provincial ranking of S4 or S5). The 5 most frequently detected species during the Winter Survey Program included:

- Black-capped Chickadee (*Poecile atricapillus*);
- Golden-crowned Kinglet (*Regulus satrapa*);
- American Crow (*Corvus brachyrhynchos*);
- *Boreal Chickadee (*Poecile hudsonicus*); and
- Dark-eyed Junco (*Junco hyemalis*).

*Indicates a SoCC

With the exception of Boreal Chickadee, the most commonly detected species have ACCDC rankings of S4 to S5, accounting for 87% of birds observed during the winter surveys and shown in **Figure 13**. Boreal chickadees are ranked S3 for vulnerable within Nova Scotia and 9 of these birds were observed during the winter surveys.

Overall, a relatively low number of birds appear to reside near the PDA during the winter months. The PDA is exposed to high winds and it is likely that resident bird species would favour habitat present within the surrounding river valleys. The 2012 winter bird surveys revealed no significant staging or wintering area for waterfowl, shorebirds or any other water associated birds, and no evidence was found to suggest significant areas for birds of prey or any other bird concentrations; consistent with the 2012 bird survey results.

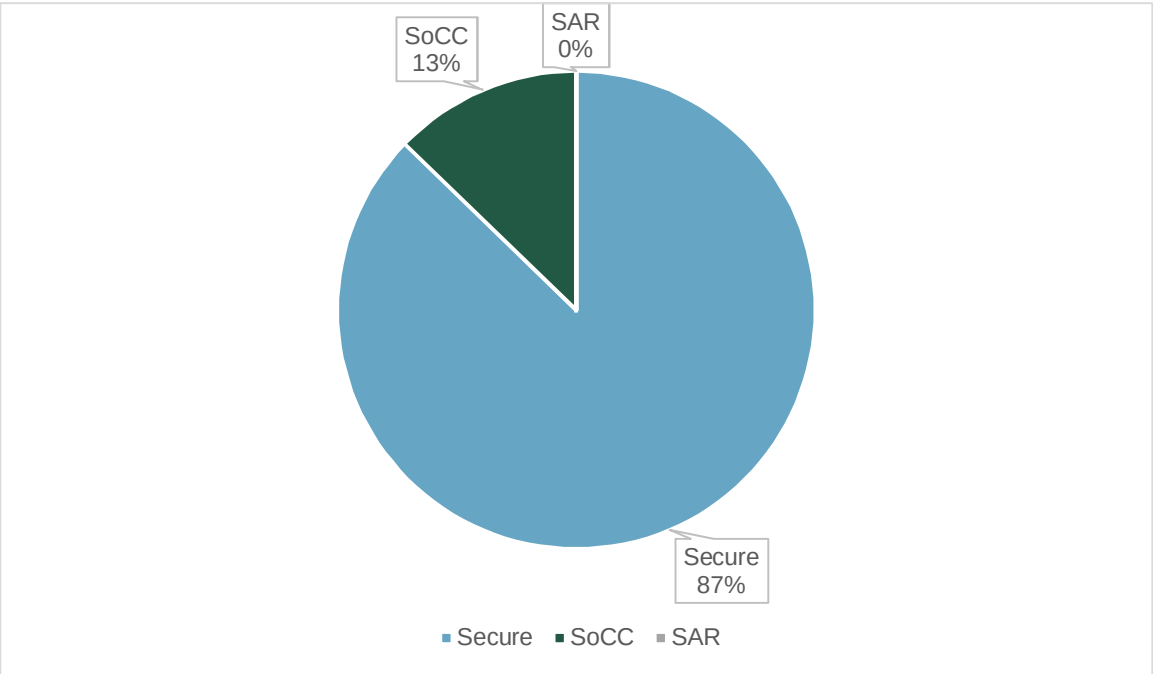


**FIGURE 13: RESIDENT BIRD SPECIES DETECTED DURING 2021 WINTER SURVEYS**

#### *6.2.4.2* Spring Survey Summary

The spring survey was conducted over five days and included two transect-based survey routes to conduct point count surveys, diurnal watch counts and a breeding nocturnal owl survey. The survey methodology, including the survey locations and timing of the diurnal watch counts, as well as results are presented in **Appendix H** and on **Figure 11**.

The highest period of migration was determined for each transect based on species diversity. This period occurred in mid to late May, based on the results of the 2021 field surveys. This timing also corresponds with the beginning of the summer nesting period (i.e., mid-April to late-August) in the birding zone of the LAA (i.e., Nesting zone C3) (ECCC 2018).

Over 1500 birds from a total of 70 species were identified during the Spring Survey program, including one species of owl that was detected during the breeding nocturnal owl survey (i.e., a single Barred Owl (*Strix varia*)). Of the 70 bird species, two were identified as SAR and 13 were identified as SoCC and the locations where they were observed during the 2021 spring birding surveys are shown on **Figure 14**. As illustrated in **Figure 15**, the most commonly detected species within the assessment area during the spring surveys are mostly regarded as having 'secure' or 'apparently secure populations' within Nova Scotia (i.e., with an ACCDC provincial ranking of S4 or S5), with the exception of the American Robin


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## SPRING 2021 OBSERVATION LOCATIONS OF BIRD SPECIES AT RISK AND SPECIES OF CONSERVATION CONCERN

FIGURE 14

- Proposed Turbine Location
- Project Development Area
- Local Assessment Area
- Watercourse
- Waterbody
- Wetland

**Incidental Bird Observation**

- Species of Conservation Concern
- Species at Risk

**Bird Type**

- American Kestrel
- Bay-breasted Warbler
- Boreal Chickadee
- Canada Warbler
- Cape May Warbler
- Evening Grosbeak
- Purple Finch
- Red-breasted Nuthatch
- Ruby-crowned Kinglet

0 0.125 0.25 0.5 km

N W E S

SCALE 1:21,000

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

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

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PROJECT: 21-1329

STATUS: DRAFT

DATE: 2022-02-08

FILE LOCATION: K:\2021\211329\Product\Client\EA_WC\WC_Terrestrial_BirdSARSOCC_Spring.mxd

(*Turdus migratorius*) and Ruby-crowned Kinglet (*Regulus calendula*). Although American Robins and Purple Finches have ACCDC S-ranks for of S5 and S4S5, respectively for breeding populations in Nova Scotia; the non-breeding populations of American Robin and Purple Finch are considered to be SoCC with ACCDC S-ranks of S3 and S3S4, respectively. For the spring survey data set, as with the fall data set, these species were reported as SoCC because their counts are likely to include migratory individuals. During the 2012 spring migration bird surveys, American Robin White-throated Sparrow, and Red-eyed Vireo were the most abundant species (Strum 2013). Similar, the 10 most frequently detected species during the 2021 Spring Survey Program included:

- White-throated Sparrow (*Zonotrichia albicollis*);
- *American Robin (*Turdus migratorius*);
- Black-throated Green Warbler (*Setophaga virens*);
- Ovenbird (*Seiurus aurocapilla*);
- Hermit Thrush (*Catharus guttatus*);
- Yellow-rumped Warbler (*Setophaga coronata*);
- Dark-eyed Junco (*Junco hyemalis*);
- Magnolia Warbler (*Setophaga magnolia*);
- *Ruby-crowned Kinglet (*Regulus calendula*); and
- Common Yellowthroat (*Geothlypis trichas*).

*Indicates a SoCC

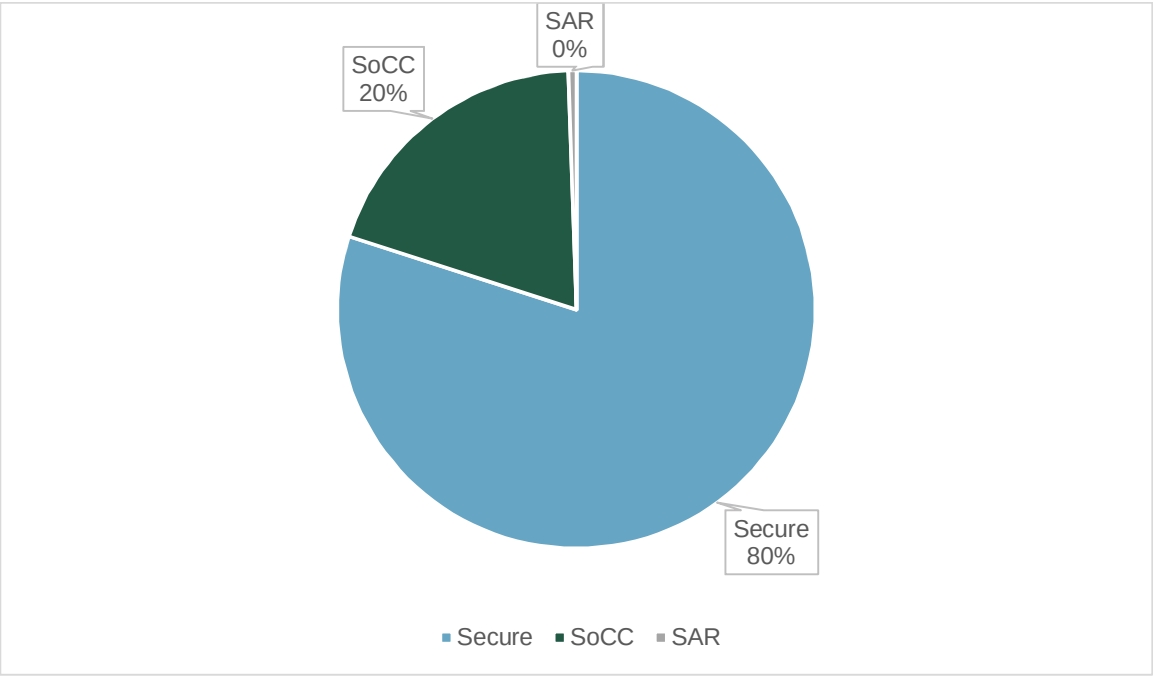



**FIGURE 15: CONSERVATION STATUS OF BIRDS DETECTED DURING THE 2021 SPRING BIRD SURVEYS**

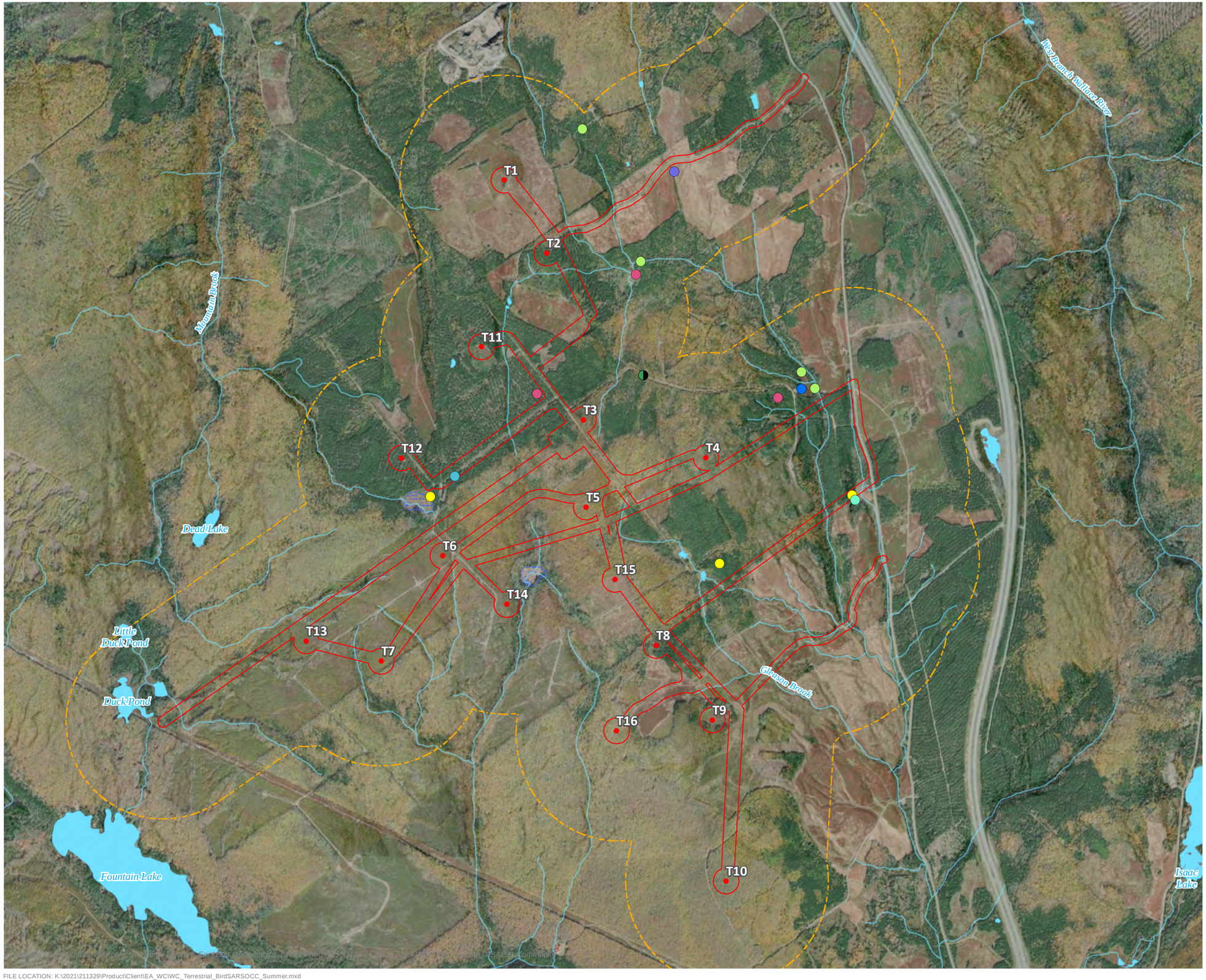
#### 6.2.4.3 Summer Survey Summary

The Summer Survey program was comprised of two visits to the same two transect-based survey routes with point counts as were established during the Spring Survey program, as well as a breeding Common Nighthawk survey. The transect-based survey routes were conducted once each during both the early and late-breeding period.

The survey methods, including the details of the survey locations, as well as the results, are presented in **Appendix H** and on **Figure 11**.

A total of 56 species were detected during the Summer Survey program. Of the 56 bird species detected, two were identified as SAR and 12 were identified as SoCC. The locations where they were observed during the 2021 summer birding surveys are shown on **Figure 16**. As illustrated in **Figure 17,** the most commonly detected species within the assessment area during the summer surveys are regarded as having 'secure' or 'apparently secure' populations within Nova Scotia (i.e., with an ACCDC provincial ranking of S4 or S5). For the summer survey data set, American Robins and Purple Finches were reported as the secure breeding population. During the 2012 breeding bird surveys, American Robin, Red-eyed Vireo, and Ovenbird were the most abundant species (Strum 2013) observed. Similar, the 10 most frequently detected species during the 2021 Summer Survey program included:

- White-throated Sparrow (*Zonotrichia albicollis*);
- Black-throated Green Warbler (*Setophaga virens*);
- Common Yellowthroat (*Geothlypis trichas*);
- Magnolia Warbler (*Setophaga magnolia*);
- Ovenbird (*Seiurus aurocapilla*);
- Red-eyed Vireo (*Vireo olivaceus*);
- Alder Flycatcher (*Empidonax alnorum*);
- American Redstart (*Setophaga ruticilla*);
- American Robin (*Turdus migratorius*); and
- Black-and-White Warbler (*Mniotilta varia*)

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# SUMMER 2021 OBSERVATION LOCATIONS OF BIRD SPECIES AT RISK AND SPECIES OF CONSERVATION CONCERN

FIGURE 16

- Proposed Turbine Location
- Project Development Area
- Local Assessment Area
- Watercourse
- Waterbody
- Wetland

**Incidental Bird Observation**

- Species of Conservation Concern
- Species at Risk

**Bird Type**

- American Kestrel
- Bay-breasted Warbler
- Boreal Chickadee
- Broad-winged Hawk
- Cape May Warbler
- Evening Grosbeak
- Red-breasted Nuthatch
- Ruby-crowned Kinglet

0 0.125 0.25 0.5 km

N W E S

SCALE 1:20,000

MAP DRAWING INFORMATION:
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MAP CREATED BY: MEC
MAP CHECKED BY: KB
MAP PROJECTION: NAD 1983 UTM ZONE 20N



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PROJECT: 21-1329

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DATE: 2022-02-11

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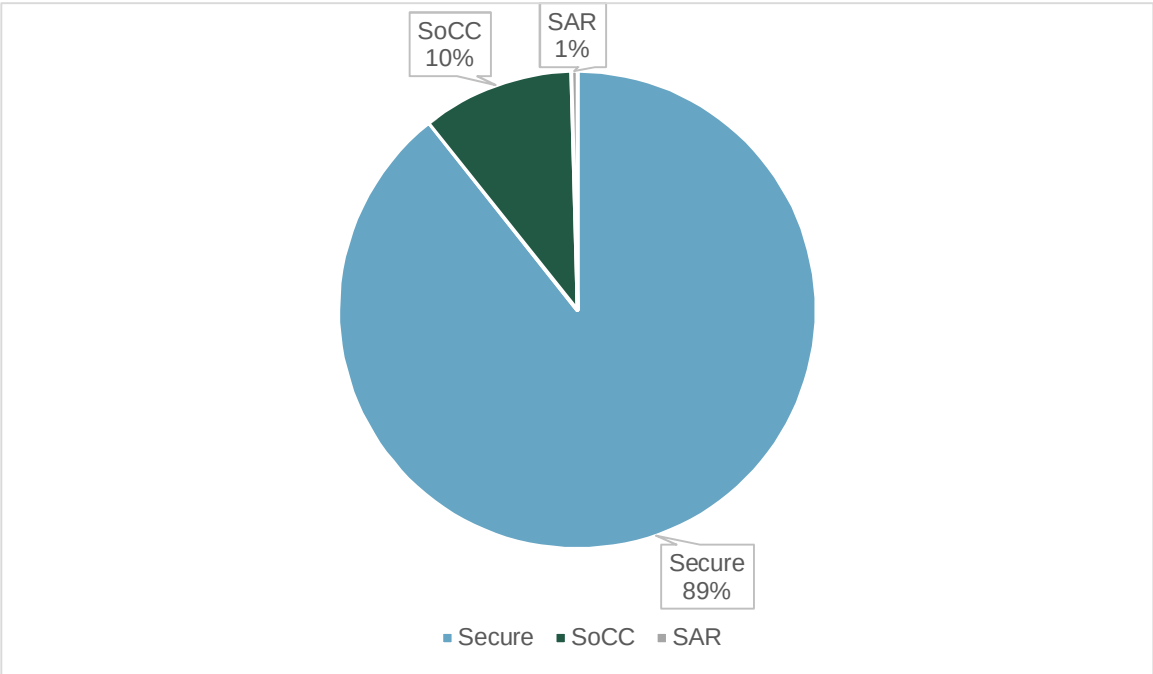


**FIGURE 17: CONSERVATION STATUS OF BIRDS DETECTED DURING THE 2021 SUMMER BIRD SURVEYS**

#### *6.2.4.4* Fall Survey Summary

The Fall Survey program was comprised of five visits along the same two transect-based survey routes with point counts as were used in both the Spring and Summer Survey programs, as well as diurnal watch counts.

The survey methods, including the survey locations and timing of the diurnal watch counts, as well as the results, are presented in **Appendix H** and on **Figure 11**.

The highest period of migration was determined for each transect based on species diversity, as was for the spring migration period. Generally, this period occurs between mid to late September and early October in Nova Scotia. The highest fall migration species diversity along of the two transects, however, occurred in late August during the 2021 field surveys, which also corresponds with the end of the nesting period (i.e., mid-April to late-August) in the birding zone of the LAA (i.e., Nesting zone C3) (ECCC 2018) .

A total of 64 species were identified during the Fall Survey program. Of the 64 bird species detected, only one was identified as SAR and 12 were identified as SoCC. The locations where they were observed during the 2021 spring birding surveys are shown on **Figure 18.** As illustrated in **Figure 19,** the most commonly detected species within the assessment area during the fall surveys are regarded as having 'secure' or 'apparently secure' populations within Nova Scotia (i.e., with an ACCDC provincial ranking of S4 or S5), with the exception of the American Robin. Although American Robins and Purple Finches have ACCDC S-ranks for of S5B and S4S5B, respectively for breeding populations in Nova Scotia; the


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# FALL 2021 OBSERVATION LOCATIONS OF BIRD SPECIES AT RISK AND SPECIES OF CONSERVATION CONCERN

FIGURE 18

- Proposed Turbine Location
- Project Development Area
- Local Assessment Area
- Watercourse
- Waterbody
- Wetland

**Incidental Bird Observation**

- Species of Conservation Concern
- Species at Risk

**Bird Type**

- Boreal Chickadee
- Canada Jay
- Canada Warbler
- Northern Harrier
- Red Crossbill

0 0.125 0.25 0.5 km

N W E S

SCALE 1:20,000

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

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

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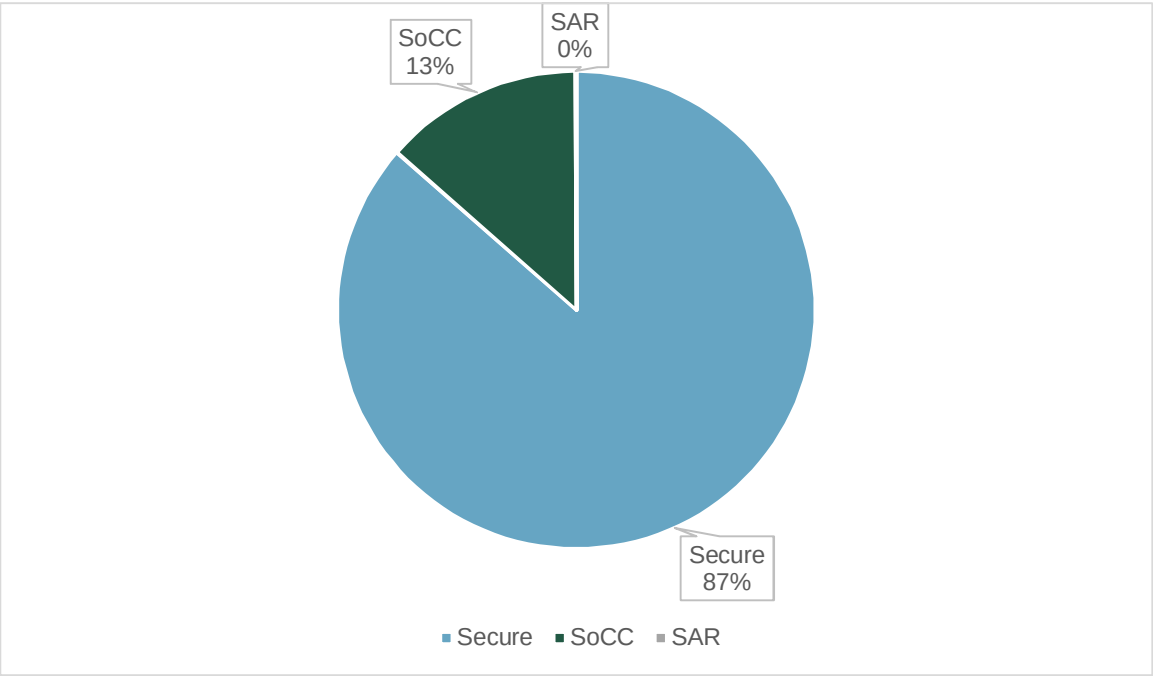



**FIGURE 19: CONSERVATION STATUS OF BIRDS DETECTED DURING THE 2021 FALL BIRD SURVEYS**

non-breeding populations of American Robin and Purple Finch are considered to be SoCC with ACCDC S-ranks of S3 and S3S4, respectively. For the fall survey data set, as with the spring data set, these species were reported as SoCC because their counts are likely to include migratory individuals. During the 2012 fall migratory bird surveys, Golden-crowned Kinglet, Black-capped Chickadee, and Common Grackle were the most abundant species (Strum 2013) observed. Similar the 10 most commonly detected species within the assessment area during the 2012 Fall Survey program included:

- Blue Jay (*Cyanocitta cristata*);
- Yellow-rumped Warbler (*Setophaga coronata*);
- Black-capped Chickadee (*Poecile atricapillus*);
- Golden-crowned Kinglet (*Regulus satrapa*);
- White-throated Sparrow (*Zonotrichia albicollis*);
- Canada Goose (*Branta canadensis*);
- Common Yellowthroat (*Geothlypis trichas*);
- Dark-eyed Junco (*Junco hyemalis*);
- *American Robin (*Turdus migratorius*); and
- Cedar Waxwing (*Bombycilla cedrorum*).

*Indicates a SoCC

Overall, habitat to support a healthy bird community throughout the year appears to exist within the LAA. It is likely that existing site land uses have influenced the avian community dynamics as a result of recent forestry activities and blueberry agriculture. There are existing cleared areas within the LAA

which limit shelter to high winds and have likely contributed to the lower bird species diversity and abundance observed during the winter months within the LAA.

#### *6.2.4.5* Nocturnal Avian Migration

This section provides an overview of the nocturnal migration aspect of the avian VEC. **Appendix I** provides a detailed assessment of the radar and acoustic monitoring conducted at the Project area in 2021.

Per the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia (NSE 2021) avian radar and acoustic studies were completed at the Project during the spring and fall migration periods 2021. The location of the radar and acoustic equipment was chosen based on availability of participating landowners to host the radar, access throughout the Project area, site security and clear sight lines. The radar was located approximately 1,500 m from the nearest proposed turbine location. The acoustic sensors were placed near the radar location and throughout the Project area. This distribution of radar and acoustic sensors allowed for sampling of nocturnal migrants throughout the Project area and provided a representation of nocturnal avian movements at the Project area. Spring migration data were collected between May 4 and June 6, 2021 and fall data were collected between August 10 and October 31, 2021.

Avian radar data were collected using Furuno x-band marine radars. The altitudinal detection range of the radars were different between the spring and fall, with detection ranges being between 70 m and approximately 400 m above ground in spring and approximately 800 m above ground in the fall; both of which detect small bird targets (e.g., warblers and sparrows) above the maximum potential turbine height. A detailed description of the radar configurations and settings used is available in **Appendix I**.

Two types of acoustic monitoring devices were used to detect nocturnal flight calls (NFCs) of migratory birds at the Project area. A 21c microphone system (Old Bird) (Old Bird Inc., Ithaca, New York, USA) was deployed in conjunction with the radar and a network of acoustic sensors (Audiomoths™) were deployed across the Project area to record NFCs. The range of each recording unit is approximately 200 m or more for the Old Bird system and approximately 100 m for the Audiomoth units.

While some level of migration was observed on most nights, a large proportion of the migratory activity observed in each season was limited to a few nights. Also, most activity was observed when favourable tailwinds were present, which are from the southwest in the spring and from the northwest in the fall. These findings are typical to other radar and acoustic studies completed in Nova Scotia (e.g., Peckford and Taylor 2008). Targets were detected at heights above ground level throughout the area sampled (i.e., between 70 m and approximately 400 m in spring and approximately 800 m in the fall), with the majority being detected below 400 m. It was also observed that on nights when large numbers of targets were detected during the beginning and middle of the night there tended to be fewer of those targets at lower altitudes (i.e., below 200 m).

During the spring season, when examining nights when large numbers of targets were detected (i.e., when most of the migration occurred) there appeared to be nights when there was relatively higher densities of migration within the rotor swept area (RSA) and others when the relative density of

migration was greater above the RSA. This pattern was also observed during the fall, but at a somewhat lesser extent/frequency.

When examining differences in detections within nights, most activity was observed during the middle of the night, and secondarily during the early portion of the night. Fewer detections were observed near dawn, suggesting that migrants may not be using the Project area as a stopover location. Stopovers would cause the migrants to make several movements associated with landing and taking off within the turbine swept area, as opposed to a single pass.

### 6.2.5 Bats and Bat Habitat

Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*M. septentrionalis*), and the Tri-Colored bat (*Pipistrellus subflavus*) are known bat species that reside in Nova Scotia. All three are small-bodied bats typical of the plain-nosed bats and all three are listed provincially and federally as Endangered. The listing is the result of drastic bat population declines that have occurred due to a fungal infection (white nose syndrome) that appears to severely affect 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, Quebec, New Brunswick and Nova Scotia (ECCC 2014). One other bat species, *Eptesicus fuscus*, commonly called the Big Brown Bat, is also known to reside in Nova Scotia; however, few sightings have been recorded. The Hoary Bat (*Lasiurus cinereus*), Eastern Red Bat (*Lasiurus borealis*), and the Silver-haired Bat (*Lasionycteris noctivagans*) are migratory bat species that are less common in Nova Scotia, but are known to live in the province for a portion of the year (Moseley 2007).

Little Brown Myotis are distributed throughout much of Canada, with the exception of northern Canada. They are also found in southern Alaska, across the United States from coast to coast, and the higher elevation forested regions of Mexico. There is also a population of this species in Iceland; however, they are presumed to have been accidently transported there on ships by humans. Mating occurs in the fall and they have liter sizes ranging from one to two pups, but most commonly one (Havens 2006). Northern Myotis are distributed across southern Canada and as far north as Newfoundland. They also inhabit much of the United States, extending through to Florida. Mating occurs during the autumn months and they are known to only have one offspring (Ollendorff 2002). Tri-Colored Bat inhabits the southern edge of Canada, eastern United States, eastern edge of Mexico, extending as far south as northern Honduras. Mating occurs between August and October, and they are known to have one set of twins in each litter (Hamlin 2004). Big Brown Bat is known to reside as far north as southern Canada, as far south as northern South America, and the West Indies (Mulheisen and Berry 2000).

Resident bats live in three different roosting sites: day roosts, night roosts, and hibernacula. Day and night roosts are used during the spring, summer and fall months whereas hibernacula sites are used during the winter months. Common hibernacula sites are typically caves and old mining shafts; whereas day and night roosts commonly include tree hollows, spaces between tree bark, rock crevices, buildings, and tree foliage.

Hoary Bat (migratory) has been spotted as far north as Southampton Island in Nunavut as well as Iceland, and as far east as Bermuda and the Orkney Islands off Scotland, during the summer months.

They commonly spend the winter months in California, southeastern United States, Mexico, and Guatemala. Hoary bats are thought to mate around the time of autumn migration, and their litter size can range from one to four, but are most commonly two (Anderson 2002). Eastern Red Bat (migratory) is widely distributed between southern Canada, Central America, Chile, and Argentina. Like the Hoary bat, mating takes place during autumn migration and their litter size can range from one to four, but are most commonly two (Myers and Hatchett 2000). Silver-haired Bat (migratory) is known to inhabit the lower south-central part of Alaska, the west coast of Canada, and the entire lower third of Canada; as well as most of the United States except for the south eastern and south western coasts, and as far south as the Victoria province of Mexico. Like the Hoary Bat, they have also been documented as far east as Bermuda. Their litter size ranges from one to two, but are most commonly litters of two (Bentley 2017).

Hoary Bat, Eastern Red Bat and Silver-haired Bat are known as solitary tree bats, and prefer to roost in a large variety of forested habitats with minimal human activity. They have; however, also been known to roost in mildly populated areas (Moseley 2007).

There are at least 21 caves with recorded bat populations on main land Nova Scotia, 8 caves and 2 abandoned mine shafts make up the most significant bat hibernacula in New Brunswick, and there are no known bat hibernacula on Prince Edward Island (Henderson at al. 2009). There is one known hibernaculum within 25 km of the proposed PDA (i.e., located approximately 12 km from the nearest proposed WTG). No observations of potential bat hibernacula were identified in the PDA during site visits and field surveys.

#### *6.2.5.1* Previously Recorded Bat Species According to ACCDC Database

The ACCDC databases were queried for known observation data of provincial and federal bat SAR or SoCC within close proximity of the Project site. No bat hibernaculum or bat species occurrences are recorded within 5 km of the Project site.

#### *6.2.5.2* Observed Bat Species

Acoustic bat surveys were conducted in 2021 across the Project Site from June 1 through to October 15 (the survey period). Five acoustic survey stations were installed within the Study Area of the proposed Project as a mechanism to capture the representative terrain and habitat types within the LAA. Details of the survey methodology, analysis and results are presented in **Appendix J**. A summary of the bat monitoring station locations and habitat description is provided below in **Table 17**, while station location are shown on **Figure 20**.

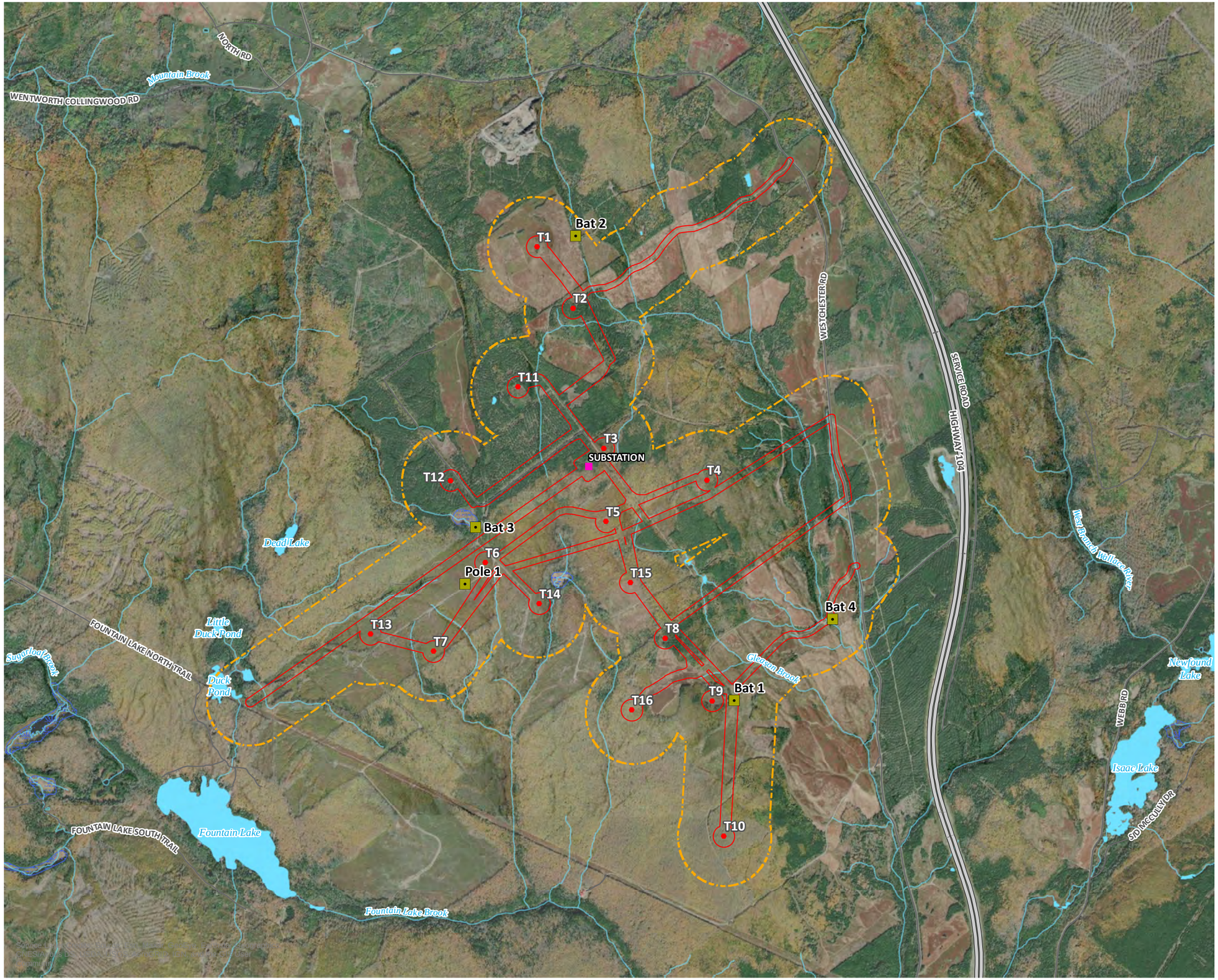
### TABLE 17: DESCRIPTION OF ACOUSTIC BAN MONITORING STATIONS

| Bat Monitor Location | Microphone Elevation (above ground level) | Surrounding Habitat Description |
|---|---|---|
| Bat 1 | 1.8 m | Equipment: Wildlife Acoustics SM3BAT/SM miniBAT<br>Habitat: Located at the edge of a blueberry field on the southern edge of the PDA.<br>Dates Deployed: June 1-5 and July 14 to October 15, 2021 (meter malfunctioned between June 7 and July 13, 2021). |
| Bat 2 | 1.5 m | Equipment: Wildlife Acoustics SM4BAT<br>Habitat: Located at the edge of a blueberry field on the northern side of the PDA.<br>Dates Deployed: August 11–October 15, 2021 |
| Bat 3 | 1.8 m | Equipment: Wildlife Acoustics SM3BAT<br>Habitat: Located at the edge of a wetland on the western side of the PDA.<br>Dates Deployed: June 1-15 (afterwards, meter was moved to Pole 1 location). |
| Bat 4 | 1.8 m | Equipment: Wildlife Acoustics SM3BAT<br>Habitat: 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.<br>Dates Deployed: June 7 – 25, June 29 – Sept 29, Oct 5 – 15 (meter malfunctioned June 26 – 29 and Sept 30 – Oct 4). |
| Pole 1 | 1.8 m | Equipment: Wildlife Acoustics SM3BAT/ SM miniBAT<br>Habitat: Located in an open, recently clear cut area, on the western side of the PDA.<br>Dates Deployed: June 16 – 25, June 30 – Sept 16, and Sept 18 – Oct 15 (meter malfunctioned June 26 – 29 and Sept 17). |
| Pole 1 | 25 m | |

The deployment periods varied through the survey program for reasons such as meter malfunctions, meter relocation and the addition of a survey location during the fall migratory period, as outlined above in **Table 17**. The analysis considers the total number of detector nights that each monitoring station was active for during the survey, which is summarized in **Table 18**.

### TABLE 18 NUMBER OF DETECTOR NIGHTS PER SURVEY STATION AND MONTH

| Station | Number of Detector Nights (2021) | | | | | |
|---|---|---|---|---|---|---|
| | June | July | August | September | October | **Total** |
| Bat 1 | 5 | 18 | 31 | 24 | 9 | **87** |
| Bat 2 | 0 | 0 | 21 | 29 | 15 | **65** |
| Bat 3 | 15 | 0 | 0 | 0 | 0 | **15** |
| Bat 4 | 20 | 31 | 31 | 29 | 11 | **122** |
| Pole 1 - Ground | 11 | 31 | 31 | 29 | 15 | **114** |
| Pole 1 - Elevated | 11 | 31 | 31 | 29 | 15 | **114** |
| **Total** | **62** | **111** | **145** | **140** | **65** | **523** |

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WESTCHESTER WIND PROJECT

## ACOUSTIC BAT SURVEY LOCATIONS

- Proposed Turbine Location
- Substation
- Highway
- Local Road
- Watercourse
- Project Development Area
- Local Assestment Area
- Waterbody
- Wetland

**Bat Observation**

- Bat Survey Location

0 0.25 0.5 1 km

N W E S

SCALE 1:24,000

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

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

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-02-09

FILE LOCATION: K:\2021\211329\Product\Client\EA_WC\WC_Terrestrial_Bat.mxd

The following bat species/species groups were detected during the 2021 bat acoustic survey program, and carried forward as part of the bat acoustic analysis:

- 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. Although Big Brown Bat (abbreviated EPFU) also produce 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.
- 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 Project area.
- Myotid Bat species (abbreviated MYOTID) is a species group that includes residential (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.

A total of 105 bat passes were recorded during the survey period, of which 82% (or 86 bat passes) were recorded during the months of August and September. The month of September alone was responsible for 54% (or 57 bat passes) of the 105 recorded bat passes. A total of six and seven bat passes were recorded in the months of June and July, respectively, with the remaining six bat passes recorded between October 1 and October 15. The number of monthly bat passes detected at each acoustic monitoring station is detailed above in **Table 18**.

The total number of bat passes per species/species group (and broken down by migratory and non-migratory species) during each monitoring month in 2021 is presented in **Figure 21**. As summarized in **Table 19** and illustrated in **Figures 21** and **22**, the MYOTID species group accounts for 72% (or 76 passes) of the 105 bat passes recorded during the survey period, of which 62% (or 47 passes) of the 76 MYOTID passes occurred during the month of September alone.

**Figure 22** illustrates the number of bat passes (illustrated as All Bats and Migratory Bats) per detector night throughout the survey period, as well as the average number of bat passes per detector night for the entire monitoring period (illustrated as Average_All Bats and Average_Migratory Bats).

### TABLE 19: NUMBER OF BAT PASSES IN 2021

| Station | Species Group | Bat Passes per Month | | | | | Total Passes |
|---|---|---|---|---|---|---|---|
| | | June | July | August | September | 1-15 October | |
| BAT 1 | LACI | 3 | 0 | 0 | 0 | 3 | 6 |
| | LANO/LABO | 3 | 0 | 0 | 8 | 0 | 11 |
| | MYOTID | 0 | 0 | 22 | 45 | 0 | 67 |
| | total | 6 | 0 | 22 | 53 | 3 | 84 |
| BAT 2 | LACI | 0 | 0 | 0 | 0 | 3 | 3 |
| | LANO/LABO | 0 | 0 | 0 | 0 | 0 | 0 |
| | MYOTID | 0 | 0 | 0 | 0 | 0 | 0 |
| | total | 0 | 0 | 0 | 0 | 3 | 3 |
| BAT 3 | LACI | 0 | 0 | 0 | 0 | 0 | 0 |
| | LANO/LABO | 0 | 0 | 0 | 0 | 0 | 0 |
| | MYOTID | 0 | 0 | 0 | 0 | 0 | 0 |
| | total | 0 | 0 | 0 | 0 | 0 | 0 |
| POLE 1-Ground | LACI | 0 | 0 | 0 | 0 | 0 | 0 |
| | LANO/LABO | 0 | 0 | 0 | 1 | 0 | 1 |
| | MYOTID | 0 | 3 | 1 | 2 | 0 | 6 |
| | total | 0 | 3 | 1 | 3 | 0 | 7 |
| POLE 1-Elvevated | LACI | 0 | 0 | 0 | 0 | 0 | 0 |
| | LANO/LABO | 0 | 0 | 0 | 0 | 0 | 0 |
| | MYOTID | 0 | 0 | 0 | 0 | 0 | 0 |
| | total | 0 | 0 | 0 | 0 | 0 | 0 |
| BAT 4 | LACI | 0 | 2 | 2 | 0 | 0 | 4 |
| | LANO/LABO | 0 | 0 | 1 | 1 | 0 | 2 |
| | MYOTID | 0 | 2 | 3 | 0 | 0 | 5 |
| | total | 0 | 4 | 6 | 1 | 0 | 11 |
| | TOTAL | 6 | 7 | 29 | 57 | 6 | 105 |

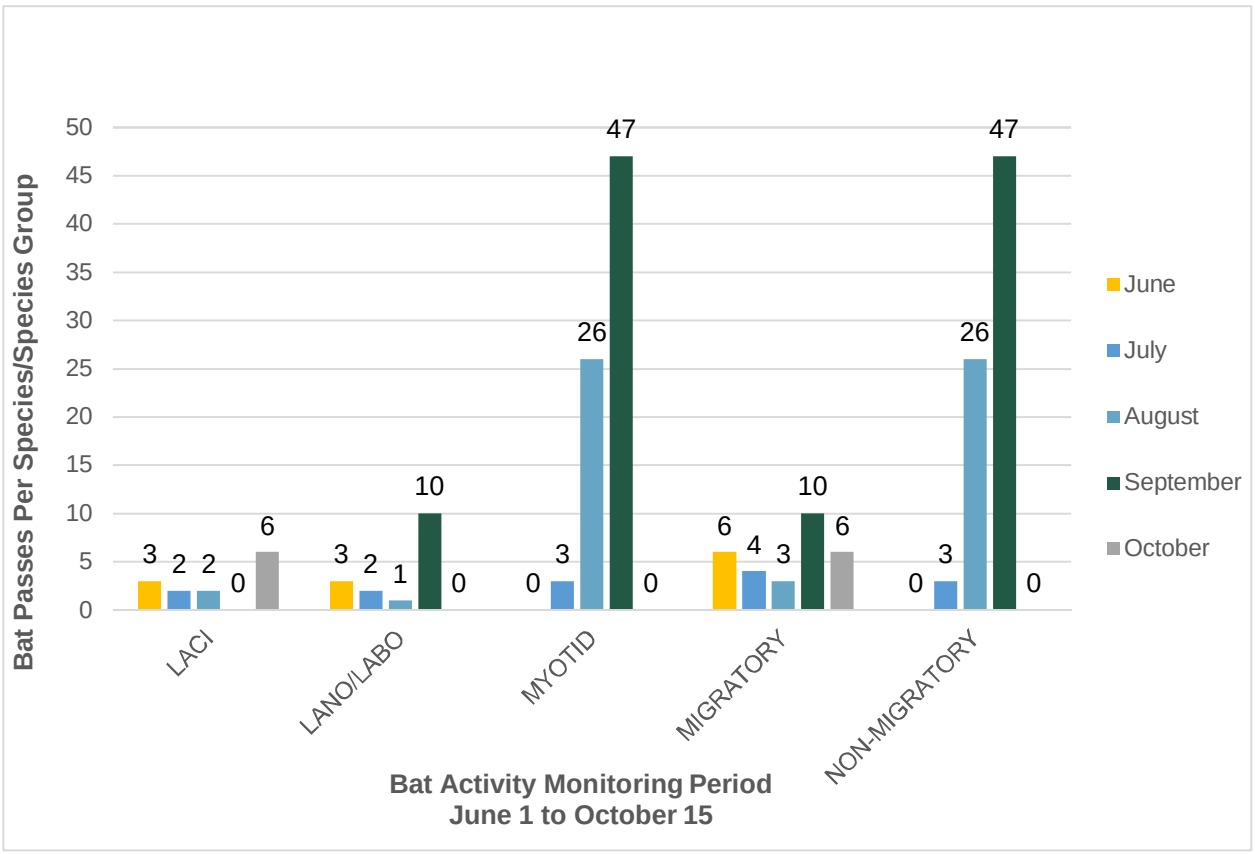



**FIGURE 21: TOTAL NUMBER OF BAT PASSES PER MONTH BY SPECIES GROUP**

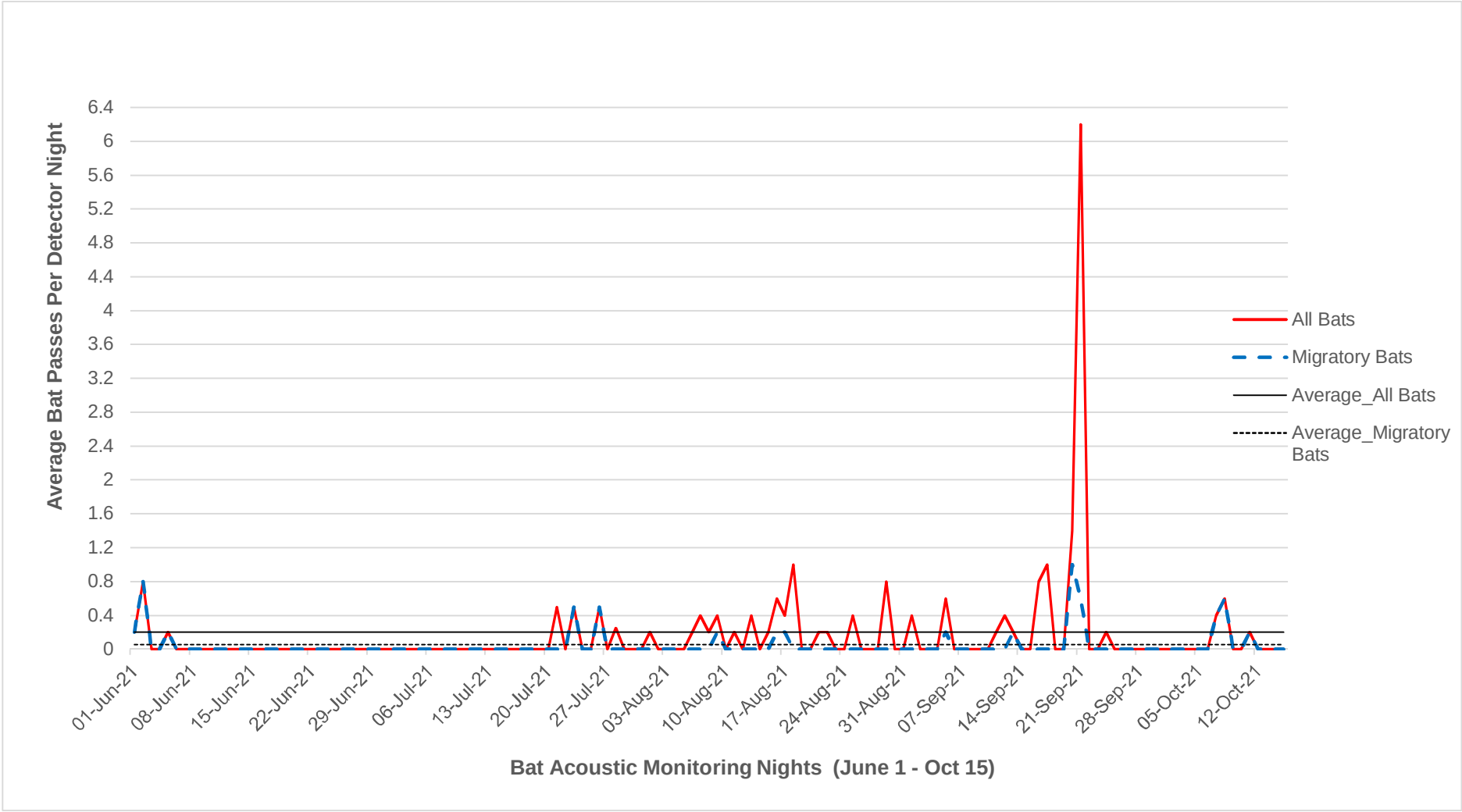



**FIGURE 22: AVERAGE NUMBER OF BAT PASSES PER NIGHT**

The average "All Bats" passes per detector night for the duration of survey period was calculated at 0.20 bat passes, whereas the average "Migratory Bats" passes per detector night for the duration of the survey period was calculated at 0.06 bat passes. If we assume a breeding period of June 1 through July 31, and a fall migration period of August 1 through Oct 15, than the average "All Bats" and "Migratory Bats" passes per detector night for those period equates to 0.08 and 0.06 bat passes, and 0.26 and 0.05 bat passes, respectively.

Based on Dillon's experience on similar bat acoustic programs throughout the country, both the total number of bat passes and the average bat passes per detector night (during the breeding period, fall migration, and entire survey period) are considered very low. As discussed above, fewer data are available during the breeding period as a result of meter malfunctions in between battery checks and later mobilization dates for Stations that occurred after June 1st. Although the total numbers of bat passes will be skewed lower as a result of fewer detector nights relative to the migratory season, the calculations of average bat passes per detector night factor in level of survey night.

#### *6.2.5.3* Bat Species at Risk

As mentioned previously, species associated with the MYOTID species group of bats (which include Little Brown Myotis, Northern Myotis, and Tri-Colored Bats) were detected during the 2021 bat surveys. These bats are known to inhabit much of Nova Scotia, and all three are listed provincially and federally as endangered. More information on SAR and SoCC bats are provided in **Section 6.2.7**.

### 6.2.6 Aquatic Environment

The Aquatic Habitat LAA, which includes 100 m upstream and downstream of watercourses that intersect with the PDA was assessed, detailed methodology and results of the watercourse assessments are provided in Appendix K.

As the Project layout evolved past the field season, some watercourses may require reassessment. Watercourses were identified within the Aquatic Environment LAA at 30 locations. In addition, a field assessment was completed at 22 of the 30 locations, the remaining locations are outside of a previously proposed Project layout. It should be noted that the majority of watercourses within the LAA occur along the proposed collector network, which will span watercourses with overhead lines and poles, avoiding the need for new crossing construction. Based on desktop and field assessments, the new proposed roads in the PDA are anticipated to cross existing watercourses at seven locations.

As previously discussed in **Section 6.1.2.2**, the PDA is largely situated within the Portapique River secondary watershed (IDJ-7) which flows south towards Minas Basin. Smaller areas of the PDA to the west and north are located within the River Philip (1DN-1) and Wallace River (1DN-3) secondary watersheds, respectively, which both flow north and eventually to the Northumberland Straight. Though the PDA is located within the Wallace River watershed, it does not cross any watercourses. The 2 crossings in the River Philip watershed (WC19 and 20) occur along the proposed transmission line which will span watercourses with overhead lines and poles, avoiding the need for new crossing construction.

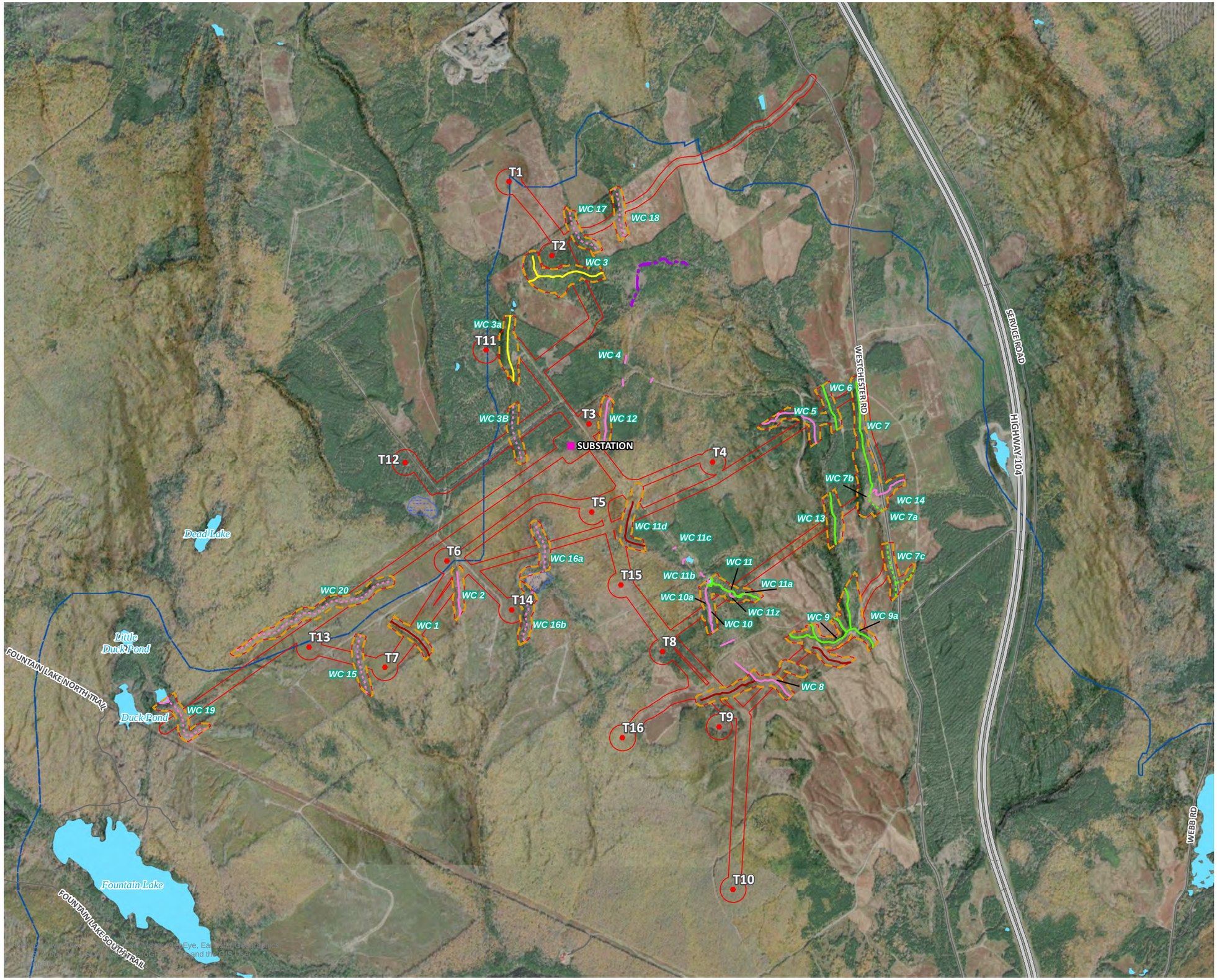
The proposed layout utilizes existing road infrastructure where possible to minimize disturbance of the local environment. As such, the proposed WTG locations were selected to avoid encroachment of watercourses and are not within 30 meters of a watercourse. The proposed access roads and collector networks, however, are anticipated cross watercourses that flow within the PDA in several locations. Mapped water features within the Aquatic Environment LAA are shown on Figure 23.

#### *6.2.6.1* Fish and Fish Habitat

Fish habitat suitability assessments were conducted in conjunction with aquatic and wetland surveys between June and October 2021. The assessment included a desktop survey to identify potential mapped fish habitat followed by field surveys to confirm the presence, absence or likelihood of suitable fish habitat within the aquatic LAA. The methods and results are presented within Appendix K.

During the watercourse assessment, each of the assessed locations contained levels of dissolved oxygen (DO) that were above the Canadian Council of Ministers of the Environment (CCME) recommended requirement of life stages (other than early) of cold water biota of (i.e., 6.5 mg/L) when measured in October 2021. With the exception of four watercourse crossing locations (WC2, WC10, WC11b, and WC12), the remainder of the assessed locations had a field-reported pH within the CCME recommended range for the protection of aquatic life (i.e., 6.5-9.0). Low field pH (i.e., below the recommended CCME guideline) was measured at one proposed crossing location of a tributary to Fountain Lake Brook (WC2 – pH 6.03). In addition, low pH was measured at three locations within tributaries to Gleason Brook (i.e., WC10, WC11b and WC12; pH 6.0, 6.1 and 6.0 respectively). Acid sensitive species (e.g., salmonids) have been historically observed within the watersheds of the PDA (ACCDC 2021). Watercourses with a pH less than 6.5 have the potential to exhibit low fish densities with few or no acid-sensitive species (Lacroix 2011).

Based on the information gathered during the 2021 fish habitat suitability assessment, the potential for watercourses at crossing locations to support fish were assessed and summarized in Table 20. In general, there are several tributaries within PDA that have characteristics of suitable fish habitat (e.g., cobble substrate, connectivity to fish-bearing waterbodies, water flow/permanency of the channel and good cover). Suitable habitat characteristics, along with water quality to support aquatic species and direct observations of fish were the basis of considerations on the likelihood of watercourses to support fish habitat. Watercourses were classed as either 'does not provide direct fish habitat', 'may provide seasonally accessible fish habitat', 'likely provides direct fish habitat', or 'fish observed', an explanation was provided where fish habitat is possible but unconfirmed. Ephemeral streams and watercourses with barriers to fish passage were typically given a low rating, whereas permanent watercourses with direct observations of fish were classed as a yes, for presence of fish habitat. Permanent or intermittent watercourses where fish were not observed that were deemed likely to provide fish habitat, and/or contained seasonally accessible fish habitat are also identified as such. Based on the fish habitat suitability assessments, Table 20 provides a summary of the potential for fish habitat to be present at assessed watercourse crossing within the PDA.

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WESTCHESTER WIND PROJECT

# AQUATIC ENVIRONMENTAL LOCAL ASSESSMENT AREA

FIGURE

- Proposed Turbine Location
- Substation
- Project Development Area
- Local Assessment Area for the Aquatic Environment
- Highway
- Local Road
- Turtle Survey Transect
- Watercourse
- Waterbody
- Wetland
- Primary Watershed Boundary

**Fish Habitat**

- Confirmed Fish Habitat
- Likely Provides Fish Habitat
- May Provide Seasonal Fish Habitat
- Unlikely to Provide Suitable Fish Habitat
- Not Field Truthed

0 0.25 0.5 1 km

N W E S

SCALE 1:20,000

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

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

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-02-11

FILE LOCATION: K:\2021\211329\Product\Client\EA_WC\WC_Aquatic.mxd

With the exception of ten locations, summarized in Table 20, the watercourses intersect the PDA along proposed roads and collector networks. The proposed locations of the WTGs were not within 30 m of waterbodies or watercourses.

**TABLE 20: WATERCOURSES WITHIN THE AQUATIC LAA**

| Watercourse and Crossing ID | Characterization | Likelihood of Fish Habitat |
|---|---|---|
| Unnamed Tributary to Fountain Lake Brook - (WC 1) | Ephemeral drainage feature with fine substrate. The channel flows through hardwood dominant forest. | Does not provide direct fish habitat. |
| Unnamed Tributary to Fountain Lake Brook - (WC 2) | Intermittent channel with ephemeral qualities, cobble substrate and stable banks. The channel flows through hardwood dominant forest. | May provide seasonally accessible fish habitat. |
| Unnamed Tributary to Gleason Brook - (WC 3) | Small permanent channel with cobble substrate and stable banks. The channel flows through mature mixed forest. | Likely provides direct fish habitat. |
| Unnamed Tributary to Gleason Brook - (WC 3a) | Small permanent channel with cobble substrate and stable banks. The channel flows through mature mixed forest. | Likely provides direct fish habitat. |
| Unnamed Tributary to Gleason Brook - (WC 3b) | To be surveyed in 2022 | May provide seasonally accessible fish habitat (unconfirmed) |
| Unnamed Tributary to Gleason Brook - (WC 4) | Intermittent channel with boulder substrate. Likely has flashy flows due to substrate size, and location in watershed (high elevation). | May provide seasonally accessible fish habitat. |
| Unnamed Tributary to Gleason Brook - (WC 5) | Intermittent, poorly defined channel with ephemeral qualities and fine substrate. The channel flows through conifer dominant forest. | May provide seasonally accessible fish habitat. |
| Gleason Brook - (WC 6) | Permanent, defined channel with gravel substrate and stable banks. The channel flows through mature mixed forest. Fish >10cm observed | Yes, fish observed |
| Unnamed Tributary to Gleason Brook - (WC 7) | Small permanent, braided channel with gravel substrate. The channel flows through a wetland. | Yes, fish observed in nearby downstream sections |
| Unnamed Tributary to Gleason Brook - (WC 7a) | Permanent channel with gravel substrate and stable banks. Below beaver dam and wetland. Minnows up to 10cm observed | Yes, fish observed |
| Unnamed Tributary to Gleason Brook - (WC 7 b) | Permanent braided channel with fine and some gravel substrate. Channel flows through grasses and wetland. Lots of large woody debris and undercut banks. School of 10cm brook trout observed | Yes, fish observed |
| Unnamed Tributary to Gleason Brook - (WC 7 c) | Likely similar to WC7a given proximity. | Yes (anticipated) |
| Unnamed Tributary to Gleason Brook - (WC 8) | Intermittent, deeply incised channel with cobble substrate. The channel flows over the existing roadbed. | May provide seasonally accessible fish habitat. |

| Watercourse and Crossing ID | **Characterization** | Likelihood of Fish Habitat |
|---|---|---|
| Unnamed Tributary to Gleason Brook - (WC 9) | Permanent, defined channel with gravel substrate and stable banks. The channel flows through mature mixed forest. | Likely provides direct fish habitat. |
| Gleason Brook - (WC 9a) | Large permanent, defined channel with gravel substrate and stable banks. Location of confluence with another channel. The channel flows through mature mixed forest. | Yes, fish observed in nearby upstream sections |
| Unnamed Tributary to Gleason Brook - (WC 10) | Intermittent, defined channel with fine substrate and stable banks. The channel flows through grasses and shrubs. | May provide seasonally accessible fish habitat. |
| Unnamed Tributary to Gleason Brook - (WC 10a) | Intermittent channel with fine substrate and ephemeral characteristics. The channel flows through grasses and shrubs. | May provide seasonally accessible fish habitat |
| Unnamed Tributary to Gleason Brook - (WC 11) | Permanent, defined channel with cobble substrate and stable banks. The channel flows through mature mixed forest. Minnows observed. | Yes, fish observed |
| Unnamed Tributary to Gleason Brook - (WC 11d) | Ephemeral, undefined channel, subsurface flow sometimes visible. Likely headwaters of channel. The channel flows through a wetland. | Does not provide direct fish habitat |
| Unnamed Tributary to Gleason Brook - (WC 11a) | Permanent, defined channel with cobble substrate and stable banks. The channel flows through mature mixed forest. Steep grade. Exposed bedrock throughout | Yes, fish observed in nearby downstream sections |
| Unnamed Tributary to Gleason Brook - (WC 11b)* | Permanent, defined channel with cobble substrate and stable banks. The channel flows through shrubs and grasses. Location of culvert blowout. Minnows observed. | Yes, fish observed |
| Unnamed Tributary to Gleason Brook - (WC 11c)* | Small permanent, defined channel with fine substrate and stable banks. The channel flows through shrubs and grasses. | Likely provides direct fish habitat |
| Unnamed Tributary to Gleason Brook - (WC 11z) | Intermittent side channel with boulder substrate and exposed bedrock. The channel flows through mature mixed forest. | May provide seasonally accessible fish habitat |
| Unnamed Tributary to Gleason Brook - (WC 12) | High gradient intermittent channel with cobble substrate and stable banks. The channel flows through mature mixed forest. | May provide seasonally accessible fish habitat. |
| Gleason Brook - (WC 13) | Permanent, defined channel with gravel substrate and stable banks. The channel flows through mature mixed forest. Minnows observed. | Yes, fish observed |
| Unnamed Tributary to Gleason Brook - (WC 14) | High gradient intermittent or ephemeral channel with cobble substrate. The channel flows through mature mixed forest. | May provide seasonally accessible fish habitat. |
| *Unnamed Tributary to Fountain Lake Brook - (WC 15) | Likely similar to WC1 and WC2, given proximity (will need to be assessed prior to project activities – located on a proposed road) | May provide seasonally accessible fish habitat |

| Watercourse and Crossing ID | **Characterization** | Likelihood of Fish Habitat |
|---|---|---|
| *Unnamed Tributary to Fountain Lake Brook - (WC 16a) | Likely similar to WC1 and WC2, given proximity | May provide seasonally accessible fish habitat |
| *Unnamed Tributary to Fountain Lake Brook - (WC 16b) | Likely similar to WC1 and WC2, given proximity | May provide seasonally accessible fish habitat |
| *Unnamed Tributary to Gleason Brook - (WC 17) | Likely similar to WC3, given proximity | May provide seasonally accessible fish habitat |
| *Unnamed Tributary to Gleason Brook - (WC 18) | Likely similar to WC3, given proximity | May provide seasonally accessible fish habitat |
| *Unnamed Tributary to Duck Pond - (WC 19) | Likely similar to WC1 and WC2, given proximity | May provide seasonally accessible fish habitat |
| *Unnamed Tributary to Mountain Brook - (WC 20) | Likely similar to WC1 and WC2, given proximity | May provide seasonally accessible fish habitat |

*Based on a desktop assessment

Two potential watercourse crossing locations are not likely to provide seasonal or permanent direct fish habitat because they contain insufficient water for most of the year. Nine locations were confirmed to provide fish habitat (based on observations of fish during the 2021 watercourse surveys). The remaining watercourses have the potential to provide habitat for freshwater species at a minimum of seasonally.

Based on a desktop assessment, there is one potential watercourse crossing (WC15) that was not included within the PDA of a previously proposed Project layout that was being considered at the time of the 2021 field surveys. The potential watercourse crossing is a headwater tributary to Fountain Lake Brook and is located within the Portapique River secondary watershed. Given the location within the watershed (i.e., headwaters) and generally steep topography of the area, it is anticipated that it will be intermittent/ephemeral in nature and may only provide fish habitat seasonally. This assumption will be confirmed prior to construction, if it is found that the watercourse is fish habitat, mitigation measures outlined in **Section 7.1.2** and 7.2.6 will be followed.

#### *6.2.6.2* Fish SAR

Based on a review of the ACCDC records, American eel and Atlantic salmon from the Inner Bay of Fundy and the Gaspe-Southern Gulf of St. Lawrence populations were observed within 13, 14 and 16 km from the PDA, respectively (ACCDC 2021). The Gaspe-Southern Gulf of St. Lawrence population was observed within the Wallace River (ACCDC 2021). 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 that 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 2021), which has been identified as critical habitat for this species. Suitable Atlantic salmon habitat was identified during initial field studies near several watercourses (summarized in Table 20).

Potential habitat for American eel is present within the PDA, noting that eels live in fresh water but spawn in salt water. Young eels enter watercourses in the spring and larger adults often move downstream in the fall. Based on the location of the PDA within the Portapique Secondary Watershed, it is likely that young eels may be encountered during the spring.

Watercourses that may be impacted by the final design will undergo additional detailed assessments to determine presence of SAR and appropriate mitigation strategies.

#### *6.2.6.3* Turtles and Turtle Habitat

A habitat suitability assessment survey was conducted along sections of Gleason Brook, as this watercourse intersects the PDA and was identified as having the highest potential to support wood turtles, the assessed locations are shown on Figure 23. The survey was conducted during the month of June (i.e., June 7, 2021), when air temperatures can be anticipated to be warmer than that of the assessed watercourses (Brown, Cochrane, and Moen 2017). This survey timing increases the likelihood of turtle detection, as most turtle species tend to utilize terrestrial habitat more often, such as basking areas to regulate their body temperatures, during this time. In contrast, when air temperatures are colder than that of the water, turtles tend to stay submerged, or on the surface of aquatic features such as watercourses or ponds (Brown, Cochrane, and Moen 2017). In addition, incidental searches for turtles were carried out in concert with the wetland field surveys, as well as during the bird surveys when suitable aquatic habitat was encountered. No turtles were observed during the 2021 field surveys and suitable wood turtle habitat was not identified within the section of Gleason Brook within the PDA. Further details on the methods and results of the habitat assessments are provided in Appendix K.

#### *6.2.6.4* Turtle SAR

In Nova Scotia, there are four species of freshwater turtle that are protected at the federal level, pursuant the Species At Risk Act (SARA); the Blanding's turtle (Emydoidea blandingii), wood turtle (Glyptemys insculpta), the snapping turtle (*Chelydra serpentina*), which are also listed at the provincial level pursuant the Nova Scotia Endangered Species Act (NS ESA), and the eastern painted turtle (Chrysemys picta picta). The eastern painted turtle was recently designated as 'Special Concern' by SARA in April 2021, and has not yet been afforded provincial protection pursuant the NS ESA.

According to the 2021 ACCDC report (Appendix L), there have been no records of turtle SAR reported within 5 km the PDA. Blanding's and wood turtles are considered "data sensitive" species by NS DNRR and the sharing of locational data, including critical habitat polygons, is highly restricted. Nevertheless, the results of the 2021 ACCDC report (Appendix L) do indicate that there have been reported observations of turtles > 5 km from the PDA. Critical Habitat for the wood turtle is present within the West Branch of the Wallace River, beginning approximately 3 km from the nearest proposed WTG location, additionally the nearest known record of a wood turtle to the PDA was 10.4 km. 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 effected given that they do not intersect the existing road.

A record of Eastern-painted turtle and snapping turtle exist within 5.5 and 16 km of the PDA, respectively; however, no turtles were encountered during the surveys conducted in June. Furthermore,

no locations of suitable wood turtle habitat were identified in the assessed section of Gleason Brook as the watercourse did not contain the necessary characteristics to support turtle habitat (i.e., slow moving, relatively deep water, and/or sand banks/bars). In addition, no observations of turtles or turtle habitat were made during other biophysical surveys.

### 6.2.7 Species at Risk

The proposed PDA will span several landscapes and include areas that have the potential to provide habitat for some species at risk (SAR) and species of conservation concern (SoCC) populations. Natural Forces is committed to protecting SAR, SoCC, and their habitat as important features and VECs related to the proposed Project.

Priority species and habitats for targeted species surveys were identified in consultation with NSDRR wildlife biologists and a desktop analysis, which includes data obtained from a site specific report provided by the Atlantic Canada Conservation Data Centre (ACCDC) (Appendix L). 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 project LAA for SAR and SoCC. Surveys were conducted between February and October 2021 to characterize site-specific environmental conditions for flora and fauna within and around the PDA. For this EA, 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 the Atlantic Canada Conservation Data Centre (ACCDC) (i.e., those species with ACCDC S-ranks of S1: Critically imperiled in province; S2: Imperiled in province; and S3: Vulnerable in province of Nova Scotia.

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:

- A custom ACCDC report (ACCDC 2021; refer to Appendix L);
- The federal SAR registry;
- The provincial Endangered Species registry;
- Publicly-available governmental Geographic Information Systems (GIS) map layers and databases;
- High resolution aerial photography; 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;
- Environmentally Sensitive Areas (ESAs) database;
- Atlas of Breeding Birds of the Maritime Provinces (MBBA);
- Important Bird Areas (IBAs) of Canada;
- Federally-designated Migratory Bird Sanctuaries;
- Provincially-identified Deer Wintering Areas (DWAs); and
- Identified Protected Natural Areas and Wildlife Management Zones (WMZ).

A list of historical SAR and SoCC flora and fauna detected within 100 km of the Project site is included in Appendix L in the site-specific ACCDC report. SAR and SoCC observed whether historically within 5 km of the PDA and/or during EA assessment activities that were carried out in 2011 and 2021 are summarized below in Tables 21 and 22.

### TABLE 21: SPECIES AT RISK OBSERVED WITHIN 5 KM OF THE PDA

| Common Name | Scientific Name | Protection Status | S-Rank | Observation |
|---|---|---|---|---|
| Plants | | | | |
| Eastern Waterfan | Peltigera hydrothyria | SARA: T<br>COSEWIC: T<br>NSESA: T | S1 | 2021 ACCDC Report 16.1 ± 0.0 km from PDA<br>Observed in 2021 field survey |
| Mammals | | | | |
| Eastern Pipistrelle | Perimyotis subflavus | SARA: E<br>COSEWIC: E<br>NSESA: E | S1 | 2021 ACCDC Report 33.3 ± 0.0 km from PDA |
| Little Brown Myotis | Myotis lucifugus | SARA: E<br>COSEWIC: E<br>NSESA: E | S1 | 2021 ACCDC Report 12.4 ± 0.0 km from PDA<br>Myotis species observed in 2012 and 2021 field surveys |
| Moose | Alces americanus | NSESA: E | S1 | 2021 ACCDC Report 7.3 ± 0.0 km from PDA |
| Northern Long-eared Myotis | Myotis septentrionalis | SARA: E<br>COSEWIC: E<br>NSESA: E | S1 | 2021 ACCDC Report 12.4 ± 0.0 km from PDA<br>Myotis species observed in 2012 and 2021 field surveys |
| Reptiles | | | | |
| Eastern Painted Turtle | Chrysemys picta picta | SARA: SC<br>COSEWIC: SC | S4S5 | 2021 ACCDC Report 5.5 ± 10.0 km from PDA |
| Snapping Turtle | Chelydra serpentina | SARA: SC<br>COSEWIC: SC<br>NSESA: V | S3 | 2021 ACCDC Report 16.5 ± 0.0 km from PDA |
| Wood Turtle | Glyptemys insculpta | SARA: T<br>COSEWIC: T<br>NSESA: T | S2 | 2021 ACCDC Report 10.4 ± 0.0 km from PDA<br>2012 ACCDC Report 9 ±10 |
| Birds | | | | |
| Bank Swallow | Riparia riparia | SARA: T<br>COSEWIC: T<br>NSESA: E | S2S3B | Potential to use the property (no breeding habitat identified)<br>2021 ACCDC Report 5.5 ± 7.0 |

| Common Name | Scientific Name | Protection Status | S-Rank | Observation |
|---|---|---|---|---|
| Barn Swallow | Hirundo rustica | SARA: T<br>COSEWIC: SC<br>NSESA: E | S2S3B | 2021 ACCDC Report 4.6 ± 7.0 km<br>Potential habitat identified in 2021 field survey |
| Bobolink | Dolichonyx oryzivorus | SARA: T<br>COSEWIC: T<br>NSESA: V | S3S4B | 2021 ACCDC Report 5.5 ± 7.0 km from PDA |
| Canada Warbler | Cardellina canadensis | SARA: T<br>COSEWIC: SC<br>NSESA: E | S3B | 2021 ACCDC Report < 5km<br>Observed in 2021 field survey |
| Chimney Swift | Chaetura pelagica | SARA: T<br>COSEWIC: T<br>NSESA: E | S2B,S1M | Potential to use the property (no breeding habitat identified)<br>2021 ACCDC Report 5.3 ± 0.0 |
| Common Nighthawk | Chordeiles minor | SARA: T<br>COSEWIC: SC<br>NSESA: T | S2B | Observed in 2021 field season<br>Breeding habitat identified<br>2021 ACCDC Report 11.7 ± 7.0 |
| Eastern Wood-Pewee | Contopus virens | SARA: SC<br>COSEWIC: SC<br>NSESA: V | S3S4B | 2021 ACCDC Report <5<br>Potential to use the property |
| Evening Grosbeak | Coccothraustes vespertinus | SARA: SC<br>COSEWIC: SC<br>NSESA: V | S3S4B,S3N | 2021 ACCDC Report < 5km<br>Observed in 2021 field survey |
| Olive-sided Flycatcher | Contopus cooperi | SARA: T<br>COSEWIC:<br>SCNSESA: T | S2B | 2021 ACCDC Report < 5km<br>Potential to use the property, habitat identified during a 2021 field survey |
| Rusty Blackbird | Euphagus carolinus | SARA: SC<br>COSEWIC: SC<br>NSESA: E | S2B | Potential to use the property<br>2021 ACCDC Report 15.5 ± 7.0 |
| Short-eared Owl | Asio flammeus | SARA: SC<br>COSEWIC: T | S1S2B | Potential to use the property<br>2021 ACCDC Report 38.2 ± 7.0 |
| Wood Thrush | Hylocichla mustelina | SARA: T<br>COSEWIC: T | SUB | Potential habitat identified in 2021 field surveys2021 ACCDC Report 12.1 ± 7.0 |
| Fish | | | | |
| Atlantic Salmon - Inner Bay of Fundy pop. | Salmo salar pop. 1 | SARA: E<br>COSEWIC: E | S1 | 2021 ACCDC Report 13.6 ± 1.0 km from PDA |
| Atlantic Salmon - Gaspe - Southern Gulf of St Lawrence pop. | Salmo salar | COSEWIC: SC | S1 | 2021 ACCDC Report 16.0 ± 50.0 km from PDA |
| Invertebrates | | | | |
| Monarch | Danaus plexippus | SARA: SC<br>COSEWIC: E<br>NSESA: E | S2B | Observed in 2012 field survey<br>2021 ACCDC Report 7.9 ± 0.0 |

Notes:

1. Atlantic Canada Conservation Data Centre (ACCDC) S-Ranks as follows: 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. (ACCDC 2021)
2. Species at risk are those species that are listed as 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) and species of conservation concern are those species not listed as SAR and ranked as S1-S3 by the ACCDC.

## TABLE 22: SPECIES OF CONSERVATION CONCERN OBSERVED WITHIN 5 KM OF THE PDA

| Common Name | Scientific Name | S-Rank | Observation |
|---|---|---|---|
| Plants | | | |
| Corrugated Shingles Lichen | Fuscopannaria ahlneri | S3 | 2021 ACCDC Report < 5km |
| Large Purple Fringed Orchid | Platanthera grandiflora | S3 | 2021 ACCDC Report 8.4 ± 1.0 km from PDA<br>Observed in 2021 field survey |
| Small Round-leaved Orchid | Platanthera orbiculata | S3 | 2021 ACCDC Report < 5km |
| Mammals | | | |
| Eastern Red Bat | Lariurus borealis | S1S2B,S1M | Observed in 2012 field survey |
| Hoary Bat | Lasiurus cinereus | S1S2B,S1M | 2021 ACCDC Report 66.8 ± 0.0 km from PDA<br>Observed in 2012 field survey |
| Long-tailed Shrew | Sorex dispar | S2 | 2021 ACCDC Report 9.9 ± 5.0 |
| Silver-haired bat | Lasinonycteris noctivagans | SUB,S1M | Observed in 2012 field survey |
| Birds | | | |
| American Kestrel | Falco sparverius | S3B | 2021 ACCDC Report < 5km<br>Observed in 2021 field survey |
| American Robin | Turdus migratorius | S5B S3N | Observed in 2021 field survey |
| Bay-breasted Warbler | Setophaga castanea | S3S4B | 2021 ACCDC Report < 5km<br>Observed during field survey in 2021 |
| Black-backed Woodpecker | Picoides arcticus | S3S4 | 2021 ACCDC Report < 5km |
| Blackpoll Warbler | Setophaga striata | S3S4B | Observed in 2021 field survey<br>2021 ACCDC Report 5.5 ± 7.0 |
| Boreal Chickadee | Poecile hudsonicus | S3 | 2021 ACCDC Report < 5km<br>Observed in 2021 field survey<br>Observed in May 2012 field survey |
| Canada Jay | Perisoreus canadensis | S3 | 2021 ACCDC Report < 5km<br>Observed in 2021 field survey |
| Cape May Warbler | Setophaga tigrina | S2B | 2021 ACCDC Report < 5km<br>Observed in 2021 field survey |
| Killdeer | Charadrius vociferus | S3B | 2021 ACCDC Report 5.5 ± 7.0 |
| Northern Harrier | Circus cyaneus | S3S4B | Observed during 2021 field season<br>2021 ACCDC Report 12.1 ± 7.0 |
| Pine Grosbeak | Pinicola enucleator | S2S3B,S5N | 2021 ACCDC Report < 5km<br>Observed in May 2012 field survey |
| Pine Siskin | Spinus pinus | S2S3 | 2021 ACCDC Report < 5km<br>Observed in May 2012 field survey |
| Purple Finch | Haemorhous purpureus | S4S5B,S3S4N | Observed during 2021 field season |
| Red Crossbill | Loxia curvirostra | S3S4 | Observed during 2021 field season<br>2021 ACCDC Report 18.0 ± 7.0 |
| Red-breasted Nuthatch | Sitta canadensis | S3 | 2021 ACCDC Report < 5km<br>Observed during field survey in 2021 |

| Common Name | Scientific Name | S-Rank | Observation |
|---|---|---|---|
| Rose-breasted Grosbeak | Pheucticus ludovicianus | S2S3B | 2021 ACCDC Report < 5km |
| Ruby-crowned Kinglet | Regulus calendula | S3S4B | 2021 ACCDC Report < 5km<br>Observed in 2021 field survey<br>Observed in May 2012 field survey |
| Spotted Sandpiper | Actitis macularius | S3S4B | 2021 ACCDC Report < 5km |
| Swainson's Thrush | Catharus ustulatus | S3S4B | 2021 ACCDC Report < 5km<br>Observed in 2021 field survey |
| Tennessee Warbler | Oreothlypis peregrina | S3S4B | 2021 ACCDC Report < 5km |
| Turkey Vulture | Cathartes aura | S2S3B | Observed in 2021 field survey<br>2021 ACCDC Report 37.1 ± 7.0 |
| Veery | Catharus fuscescens | S3S4B | 2021 ACCDC Report < 5km |
| Vesper Sparrow | Pooecetes gramineus | S2B | 2021 ACCDC Report < 5km |
| Wilson's Snipe | Gallinago delicata | S3B | 2021 ACCDC Report < 5km |
| Yellow-bellied Flycatcher | Empidonax flaviventris | S3S4B | 2021 ACCDC Report < 5km |
| Fish | | | |
| Brook Trout | Salvelinus fontinalis | S3 | 2021 ACCDC Report 15.6 ± 0.0 km from PDA<br>Observed in 2021 field survey |
| Invertebrates | | | |
| Northern Pygmy Clubtail | Lanthus parvulus | S3S4 | 2021 ACCDC Report < 5km |

Notes:

1. Atlantic Canada Conservation Data Centre (ACCDC) S-Ranks as follows: 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. (ACCDC 2021).
2. Species at risk are those species that are listed as 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) and species of conservation concern are those species not listed as SAR and ranked as S1-S3 by the ACCDC.

With respect to SAR or potential SAR that has the potential to be present at the Project site, the following sections provide a brief description of the preferred habitat for SAR that have historically been reported at or near the Project site.

#### *6.2.7.1* Plant and Lichen SAR and SoCC:

The Eastern Waterfan *(Peltigera hydrothyria*) was the only plant SAR observed during the 2021 field season. Eastern Waterfan is ranked as Threatened (COSEWIC, SARA, NSESA) and S1 for Critically Imperiled (ACCDC). Eastern Waterfan is an aquatic, lobed lichen that can be found on the margins, rocks, and backwater of streams (COSEWIC 2013). Eastern Waterfan depends on clear, free flowing streams with no presence of algae and elevated mineral levels. The Eastern Waterfan observation in the 2021 field visit confirms its presence on the Project site and is located in the Gleason Brook.

One plant SoCC was observed during the 2021 field surveys (i.e., Large Purple Fringed Orchid (Platanthera grandi*fl*ora). This species is classified as S3 for Vulnerable based on the ACCDC conservation status system. Large Purple Fringe Orchid can be found in swamps, marshes, bogs, forests and disturbed habitats (NAOCC 2022).

Two additional plant SoCC that were not identified during the field surveys were reported by the ACCDC within 5 km of the PDA; Corrugated Shingles Lichen (Fuscopannaria ahlneri) and Small Round-leaved Orchid (Platanthera orbiculata). Corrugated Shingles Lichen (Fuscopannaria ahlneri) is listed in the ACCDC report as S3 for Vulnerable. This species was not observed on the Project site during the 2021 field season. However, it is located within the 5 km boundary surrounding the site. Corrugated Shingles Lichen is found in old-growth conifer stands in Oceanic forests (The Global Fungal Red List Initiative 2015). According to the ACCDC, there was only one record of Corrugated Shingles Lichen within the 5 km boundary. Thus, it is unlikely to be found on the property. Small Round-leaved Orchid (Platanthera orbiculata) is also listed as S3 for Vulnerable by the ACCDC report. Small Round-leaved Orchid is a bog species that can be found in wetlands and mesic to wet-mesic forests (Native Plant Trust, 2022). Suitable habitat for the Small Round-leaved Orchid is present, however it is not on the site right now.

#### *6.2.7.2* Insect SAR and SoCC

A Monarch Butterfly (Danaus plexippus) was observed during a 2012 field survey and was listed in the ACCDC report just outside of the 5 km boundary (7.9 km). Monarchs are designated as an Endangered species (COSEWIC, NSEA), and of Special Concern (SARA) with a ranking of S2B by the ACCDC. This ACCDC designation refers to its breeding population and the S2 designation alludes to a limited and Imperiled standing. Based on the desktop report, monarchs will prefer open habitat in the Atlantic region. A section of the Project footprint has been cleared for blueberry production. Monarchs are not expected to use the area to any significant extent (breeding), given there are no records of milkweed within the PDA. Monarchs do likely migrate through the LAA on an occasional basis, as supported by the observation in the 2012 field survey.

Although not identified during field surveys of the PDA, the Northern Pygmy Clubtail (Lanthus parvulus) was identified in the 2021 ACCDC report within the 5 km of the PDA. Northern Pygmy Clubtail does not have a designation with COSEWIC, SARA or NSESA, but it is listed as S3S4 for Vulnerable to Secure within the ACCDC system. Northern Pygmy Clubtail prefer riverine habitats with a moderate to high gradient and associated strong flow. Suitable habitat for Northern Pygmy Clubtail is present on the Project area, as the footprint has prominent topography and streams to support breeding habitat. The observation of the species within the 5 km border of the PDA based on the ACCDC report also indicates the chance of the Northern Pygmy Clubtail to interact with the PDA.

#### *6.2.7.3* Mammal SAR and SoCC:

The following four SAR (i.e., Little Brown Myotis, Northern Long-eared Myotis, Eastern Pipstrelle, and Mainland Moose) were observed within 5 km of the PDA either during the 2011 or 2021 environmental assessment surveys or as reported by the ACCDC:

- Mainland Moose (Alces americanus) are listed as Endangered by the NSESA, COSEWIC and SARA, and ranked as S2 by the ACCDC 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 field surveys, mainland moose were reported by the ACCDC 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.

- Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) are listed as Endangered (SARA, COSEWIC and NSESA) and ranked by the ACCDC as S1 for Critically Imperiled in Nova Scotia. The bats were detected using acoustic bat monitors during the 2011 and 2021 sampling seasons, although the exact species of bat could not be determined, it is likely that all were Myotid bats. The Little Brown Myotis is the most common bat species in Nova Scotia and is the most likely species to occur the area; however, Northern Myotis may also be present, but in lower numbers. These bat species are expected to occur with patchy distribution reflecting favourable habitat conditions and, in particular, available insect food sources. Habitat requirements for these bats include winter hibernacula such as caves or old mine openings that maintain a relatively stable temperatures (2-10°C) and high humidity levels (>80 %) throughout the winter, as well as summer day-roosting and maternity-roosting habitat such as abandoned woodpecker cavities, loose bark, knot holes, cracks or hollows. Bats exhibit high site fidelity to known hibernacula in the region, although, there are no known hibernacula within the LAA for the Project. Summer day-roost and maternity-roost sites may occur in suitable tree features, such as abandoned woodpecker cavities, loose bark, knot holes, cracks or hollows. Additionally, bats may also use cavities and crevices in or on human infrastructure as roosting sites. However, most of the time roost sites are mature trees (dead or alive) with a large hollowed-out cavity or cavities. Abandoned mine openings are also found within approximately 10 km of the Project area, which can be used as suitable hibernacula.

In addition, three bat SoCC have been observed or detected within 5 km of the PDA during field surveys (i.e. Hoary bat, Eastern Red bat and Silver-haired Bat). The Hoary Bat (Lasiurus cinereus) and Eastern Red Bat (Lariurus borealis) both have ACCDC conservation rankings of S1S2B, S1M meaning the breeding population is Imperiled to Critically Imperilled, and the migrant population is Critically Imperiled. Both of these species were identified during the 2021 field surveys. The Silver-haired Bat (Lasinonycteris *noctivagans*) was also observed on the site during the 2011 field surveys and is ranked by the ACCDC as SUBS1M as the migrant population is Critically Imperiled within the province.

Although not identified during field surveys of the PDA, a Long-tailed Shrew (Sorex dispar) was reported by the ACCDC within 5 km of the PDA. Long-tailed shrews are listed as S2 for Imperiled (ACCDC 2021). 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 2021 ACCDC report, the species has had observations within the 15 km boundary surrounding the project site. Although not observed during the 2021 field surveys, Long-tailed Shrews have potential to occur within the general Area of the PDA.

#### *6.2.7.4* Herptile SAR and SoCC:

Although reptile or amphibian (herptile) SAR or SoCC were not observed during the 2021 field surveys or within 5 km as reported by the ACCDC (Appendix L), the ACCDC (2021) 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. Surveys for turtles

were conducted in 2021 as part of the environmental assessment for the Project and further details of the Turtle surveys are presented in **Section 6.2.6**. Searches for additional herptile species were conducted incidentally in conjunction with other biological field surveys and are further described in **Section 6.2.2**.

Eastern Painted Turtle (Chrysemys picta picta) is listed as Special Concern (SARA and COSEWIC) and ranked by the ACCDC as S4S5 for Apparently Secure to Secure. Painted Turtles prefer wetland and shallow water bodies with slow moving water, abundant vegetation, and basking sites (COSEWIC 2018a). Suitable nesting habitat includes open sloped areas with sandy-loamy and/or gravel substrate that is generally within 1200 m of a waterbody (COSEWIC 2018a). Suitable overwintering habitat requires shallow water bodies with deep sediment (COSEWIC 2018a). No observances were reported during the 2021 surveys. Limited potential suitable habitat for basking was observed on the Project site during the 2021 surveys; however, no suitable habitat for overwintering or nesting were observed.

Snapping Turtle (*Chelydra serpentina*) is listed as Special Concern (COSEWIC, SARA), and Vulnerable (NSESA). The ACCDC ranks its protection status as S3 for Vulnerable. Snapping turtles have a preference for, but are not limited to living in slow moving or closed off water bodies with dense aquatic vegetation (COSEWIC 2008). The species was detected within the 20 km of the PDA (ACCDC 2021), however no Snapping Turtles were found during the 2021 field surveys. Water bodies within the project area do not likely provide the size and vegetation to support a snapping turtle population; as such, their presence within the PDA is considered to be unlikely.

Wood turtle (Glyptemys insculpta) is listed as Threatened (SARA, COSEWIC, NSESA) and ranked by the ACCDC as S2 for Imperiled. Wood Turtles prefer to be in or around streams or rivers for mating, hibernation, and temperature regulation (COSEWIC 2018b). Wood turtles are associated with water bodies that have sandy or gravely bottoms, with clear water and moderate current (COSEWIC 2018b). Nesting sites are located along sand or gravel river banks and beaches. Critical Habitat for the Wood turtle is present within the West Branch of the Wallace River, beginning approximately 3 km from the nearest proposed WTG location, additionally the nearest known record of a wood turtle to the PDA was 10.4 km. 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 effected given that they do not intersect the existing road.

#### *6.2.7.5* Bird SAR and SoCC:

Three bird SAR were observed during the 2021 field surveys which were conducted over four seasons at various locations across the PDA. Details of the bird surveys are provided in **Section 6.2.**4. Bird SAR observed within the LAA during the 2021 field surveys included:

- Canada Warbler (Wilsonia canadensis) is listed as Threatened (SARA), Special Concern (COSEWIC), Endangered (NSESA) and ranked by the ACCDC as S3B for Vulnerable in Nova Scotia for the breeding population. Canada Warblers typically breed throughout the Maritimes and southeastern Canada. This species prefers wet mixed forests with well-developed shrub layers, as well as regenerating areas. Canada Warblers were detected during a 2021 field survey and suitable nesting habitat does

exist within the PDA. Canada Warblers were observed during the spring and fall migration surveys (i.e., during May and late August 2021, respectively).

- Common Nighthawk (Chordeiles minor) is listed as Threatened (SARA and NSESA), Special Concern (COSEWIC) and ranked by the ACCDC as S2B for Imperiled in Nova Scotia for the breeding population. Common Nighthawk typically nest on the ground in open or sparsely vegetated habitats. This species was detected within the Project site and suitable breeding habitat was identified. Common nighthawks were observed during nocturnal birding surveys conducted on June 21, 2021).
- Evening Grosbeak (Coccothraustes vespertinus) is listed as Special Concern (SARA and COSEWIC), Vulnerable (NSESA) and ranked by the ACCDC as S3S4B S3N in Nova Scotia for Vulnerable to Apparently Secure for the breeding population and Vulnerable for the non-breeding population. 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 the winter months. Evening Grosbeaks were identified in the spring and summer 2021 field surveys, and are listed within the 5km border in the ACCDC report. Potential breeding habitat for the evening grosbeak does exist in forested areas with mature trees present on the Project site. Evening grosbeaks were identified during the 2021 spring migration and summer breeding surveys.

According to the 2021 ACCDC report for the PDA, an additional nine bird SAR have been reported within 5 km of the PDA:

Bank Swallow (Riparia riparia) is listed as Threatened (SARA and COSEWIC), Endangered (NSESA) and ranked by the ACCDC as S2S3B for Vulnerable to Imperiled in Nova Scotia for the breeding population. Bank swallows are a colonial breeder that is 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. This species was detected within 10 km of the Project site according to ACCDC records; however no observances were reported during the 2021 surveys. Suitable habitat for bank swallows is limited and breeding habitat is not present. They are not expected to occur frequently at the site.

Barn Swallow (Hirundo rustica) is listed as Threatened (SARA and COSEWIC), Endangered (NSESA) and ranked by the ACCDC as S2S3B for Vulnerable to Imperiled 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. Barn Swallows are migratory and winter in Central and South America. This species was detected within 10 km of the Project site according to ACCDC records; however no observances were reported during the 2021 surveys. Potential habitat for Barn Swallows was identified during a 2021 field survey. But they are not expected to occur frequently at the site.

Bobolink (Dolichonyx oryzivorus) is listed as Threatened (SARA and COSEWIC), Vulnerable (NSESA) and ranked by the ACCDC as S3S4B for Vulnerable to Imperiled in Nova Scotia for the breeding population. This species can be found in overgrown areas of disturbance, tall grassland, uncut pastures and prairie habitat. During the breeding season they can be found in marches and agricultural fields (Cornell Lab 2022a). Although Bobolinks have been observed within the 12 km of PDA (ACCDC 2021), suitable

breeding habitat was not identified within the PDA during the 2021 surveys and they are considered unlikely to be present near the PDA.

Chimney Swift (Chaetura pelagica) is listed as Threatened (SARA and COSEWIC), Endangered (NSESA), and ranked by the ACCDC within Nova Scotia as S2B for Imperiled for the breeding population and S1M as Critically Imperiled for the migratory population. Historically, the Chimney Swift used mainly large hollow trees for nesting sites but have adopted chimneys as preferred nesting sites. They are generally associated with urban and rural areas where chimneys are available for nesting and roosting. Chimney Swifts are aerial foragers and tend to concentrate near water where insects are abundant. Potential forging habitat was detected on the site during 2021 field surveys; however, no breeding habitat was identified. Although not observed during the 2021 field surveys, and the ACCDC (2021) reported observations of Chimney Swifts within the 5 km of the PDA.

Eastern Wood-Pewee (Contopus virens) is listed as Special Concern (COSEWIC/SARA) and Vulnerable (NSESA) and ranked by the ACCDC as S3S4B for Vulnerable to Apparently Secure in Nova Scotia for the breeding population. Eastern Wood-Pewee breed throughout Nova Scotia during the summer months before migrating to northern South America for wintering. This species breeds in open woodland of all types in Nova Scotia, but shows a preference for forests that are deciduous dominant. The Eastern Wood-Pewee forages on flying insects in the mid-canopy. This species was detected within the 5 km Project footprint (ACCDC 2021) and has the potential to be present within the PDA.

Olive-sided Flycatcher (Contopus cooperi) is listed as Threatened (SARA and NSESA), Special Concern (COSEWIC) and ranked by the ACCDC as S2B for Imperiled in Nova Scotia for the breeding population. This species nests in open, forested areas, often with many conspicuous perches. Olive-sided Flycatchers were detected within the Project site and suitable nesting habitat does exist. Olive-sided Flycatchers were not observed throughout the 2021 surveys; however, potential habitat is present within the PDA and the 2021 ACCDC report contained observations within the 5 km border of the PDA.

Rusty Blackbird (Euphagus carolinus) is listed as Special Concern (SARA and COSEWIC), Endangered (NSESA) and ranked by the ACCDC as S2B for Imperiled in Nova Scotia for the breeding population. Rusty Blackbirds nest in conifer-dominated forests, wetlands, bogs and wet meadows. This species may occur within the Project site as suitable nesting habitat does exist.

Short-eared Owl (Asio flammeus) is ranked as Threatened (COSEWIC), Special Concern (SARA) and S1S2B for Critically Imperiled and Imperiled for the breeding population (ACCDC). This species can be found in open habitats, marshlands, bogs, fields; winters to south, and generally migrates along the coast. They may also breed in grassy open areas including wetlands in the Maritimes, and may over-winter in coastal areas. The Short-eared Owl was not identified in the 2021 field surveys, but potential habitat was observed. The species is also found within the 40 km boundary surrounding the Project footprint.

Wood Thrush (Hylocichla mustelina) is ranked as Threatened (COSEWIC, SARA) and its ACCDC designation of SUB for the breeding species means it is unrankable due to lack of information. This species can be found in mature deciduous and mixed forests with mature stands of over 15 m with a sustainable understory of saplings and shrubs, and an open moist forest floor with leaf litter and decay. Potential habitat was identified during the 2021 field surveys, however no observations occurred. According to the ACCDC report there have been sightings of Wood Thrush within the 20 km of the PDA.

Following a review of birds surveys conducted in 2011/2012 and 2021, as well as the 2021 ACCDC report for the PDA, bird SoCC or their potential habitat were identified within or near the PDA. Table 23 is a summary of the 19 bird SoCC that were observed during field surveys or have potential habitat identified within the LAA. Scientific names and ACCDC S-rankings are provided previously in Table 23.

**TABLE 23 BIRD SOCC OBSERVED WITHIN THE BIRD LAA**

| Species | Habitat | Observations |
|---|---|---|
| American Kestrel | Open to semi-open habitats such as fields and wooded edges where raised perches are present to hunt from (Audubon 2022a).<br>Kestrels prefer to nest in areas where there are a few standing snags to choose from as they are cavity nesters. | American Kestrels were observed numerous times during the 2021 field surveys with over 20 observations in multiple habitat types from May to September 2021. |
| American Robin<br>(non-breeding population) | The non-breeding population is present during the winter months and includes birds that breed further north migrate southward to winter in Nova Scotia. | Robins were observed on the property throughout the Spring, Summer, and Fall survey periods. 43 observations were made during the fall season, so it is anticipated that small numbers of Robin will occur on the open areas of the property in winter months. |
| Bay-breasted Warbler | Low-elevation coniferous forests and mostly feed off of spruce budworm (Cornell Lab 2022b). | Observed during the 2021 field surveys with a total of 19 observations from spring to fall. The presence of the species during the surveys and its generalist habitat preferences reflecting the property alludes to species using the area. |
| Black-backed Woodpecker | Coniferous forests, forested bogs, and prefers recently burned areas with deadfalls or bark beetle outbreaks (Cornell Lab 2022c). | Species reported by the ACCDC (2021) approximately 5 km from the PDA. Due to its habitat preferences, particularly disturbed and recently burned sites, it is not likely to be found utilizing this site. |
| Blackpoll Warbler | High-density spruce-fir forests at high elevation and coastal areas. | Observed a total of 9 times throughout the 2021 field surveys, 2 in the spring and 7 in the fall. Blackpoll Warblers should be anticipated to use the property as a stopover habitat during migration periods |
| Boreal Chickadee | Conifer forests, especially spruce. | Observed during the 2021 field season 31 times during the spring, summer and fall survey periods. During field surveys they were found across many habitat types including |

| Species | Habitat | Observations |
|---|---|---|
| | | but not limited to the young, regeneration and old mixed hardwood, softwood, and wetland habitats on the property. |
| Canada Jay | Canada Jays are highly adaptable species and are found in boreal or subalpine forested habitats with a preference for Black and White Spruce. This species is known to eat anything from seeds to insects, and rears its young in the dead of winter (Cornell Lab 2022d). | Observed during the spring, summer and fall in the 2021 field season at a total of 13 observations. Based on the observations and relaxed habitat preferences it is concluded that Canada Jay will use the property. |
| Cape May Warbler | Prefer to nest in mature coniferous dominated woodlands. | Observed during the 2021 field visits through the spring to fall with a total of 13 observations. It is likely that the species will use the property. |
| Northern Harrier | Resident species that most commonly breeds in large, undisturbed grasslands where it also hunts for small mammals by flying low over open areas and diving onto prey. | Observed throughout the 2021 field surveys in the agricultural and grassland portion of the property. This species has the potential to use the property year-round and may nest on site if there is any tall grassland on the property. |
| Pine Grosbeak (breeding population) | Breeds in coniferous dominated forest types, but is more frequently detected during the winter. Similar to Pine Siskins, the movements of Pine Grosbeaks can be quite nomadic and unpredictable as flocks search for fruit and seed crops. | Observed in the 2012 field surveys, and reported within the 5 km of the PDA (ACCDC 2021). This species is not expected to nest on the Project footprint but is anticipated to occasionally stop-over in forested areas of the property during migratory periods. |
| Pine Siskin | Resident species of the Maritimes, however, there are famously nomadic, seeming to move wildly and erratically across hundreds of kilometers in response to seed crops on which they forage. | Observed during the 2021 field season. This species should be anticipated to occur in small number in the late fall and remain through the winter months. |
| Purple Finch (non-breeding population) | Wooded to semi-open areas during migration and winter. Can be found in Coniferous or mixed woods, and suburbs (Audubon 2022b) | Purple Finch were observed on the property during the 2021 field surveys in consistent numbers during the spring, summer, and fall survey periods. As Purple Finch have been detected on the property during the late fall months, this species can be reasonably anticipated to occur on site in small numbers in the late fall. |
| Red-breasted Nuthatch | Coniferous forests of fir, pine, hemlock, larch and spruce. During winters of surged population growth, you can find the species in orchards, parks, scrub and shade trees (Cornell Lab 2022e) | Red-breasted Nuthatch was observed during the 2021 field surveys, and during the fall and winter had sightings of 32 individuals on the property. This species will use and be found on the property. |

| Species | Habitat | Observations |
|---|---|---|
| Red Crossbill | Red Crossbills are favourable to a mature spruce, pine, or larch forests, and are known to forage with White-winged Crossbill in White and Engelmann spruce in the late summer when cone crops are abundant (Cornell Lab 2022f). | Red Crossbill were observed in the 2021 field season during the summer and fall surveying periods. Based on the species observation in the area during their breeding period (late summer early fall) and the partially open forest present it is assumed that Red Crossbill have the potential to breed here. |
| Rose-breasted Grosbeak | During the breeding season this species shows a preference for mature deciduous forest types, often near watercourses. | Reported within 5 km of the PDA (ACCDC 2021). This species is not expected to nest on the property but is anticipated to occasionally stop-over along forested edges on the property during migratory periods. |
| Ruby-crowned Kinglet (non-breeding population) | Spruce-fir forests, mixed woods, meadows, deciduous forests, coniferous forests, and floodplains. Ruby-crowned kinglets nest high up in the canopy and thus prefer older stands of forest. | The species was observed during the 2021 field survey from the spring to fall, but particularly in the spring with 44 observations. Breeding habitat is present on the property and the species is present. |
| Swainson's Thrush (non-breeding population) | Neo-tropical migrant shows a preference for balsam fir and spruce-dominated forest types. | Reported within 5 km of the PDA (ACCDC 2021). Based on a lack of observations, it is unlikely that Swainson's Thrush will utilize the PDA. |
| Turkey Vulture | Foraging habitat is based on prey availability and has been known to vary. | A Turkey Vulture was observed in the 2021 field survey. . If the prey is present to support the species foraging habits, then Turkey Vultures would occasionally use the site. |
| Yellow-bellied Flycatcher (non-breeding population) | Neo-tropical migrant shows a preference for coniferous-dominated forests, bogs and swamps with a dense, shrubby understory. | Reported within 5 km of the PDA (ACCDC 2021). Based on its observation location, suitable breeding habitat does not exist for this species. |

#### *6.2.7.6* Fish SAR and SoCC

No fish SAR and one fish SoCC (i.e., Brook Trout (*Salvelinus fontinalis*)) were observed during the 2021 field surveys. Based on a review of the ACCDC records, American Eel (Anguilla rostrata), and two populations of Atlantic Salmon (Inner Bay of Fundy, Nova Scotia Southern Upland, and Gaspe-Southern Gulf of St. Lawrence) were previously reported within 20 km of the PDA.

American Eel (Anguilla rostrata) is ranked as Threatened (COSEWIC) and S2 for Imperiled (ACCDC). 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). This species was not observed during the 2021 field surveys and is reported within 15 km of the Project boundary according to the ACCDC. Based on its varied habitat use and widespread distribution the species may utilize the PDA.

Atlantic salmon (Salmo salar) spawns in fresh water, and will spend three or four years of its juvenile period before going out to the North Atlantic (DFO 2018). These salmon require clear rivers with cool, well-oxygenated water and gravel bottoms (DFO 2018). The inner Bay of Fundy pop. (Salmo salar pop. 1) is ranked as Endangered (COSEWIC, SARA) and S1 for Critically Imperiled (ACCDC). One of the 10 rivers identified as critical habitat for the species is located approximately 3 km south of the PDA (Portapique River). The species was not found during the 2021 field observations, however, Gleason Brook contains potential spawning habitat for this species.

The Gaspe-Southern Gulf of St. Lawrence population of Atlantic Salmon (Salmo salar) is ranked as Special Concern (COSEWIC), and S1 meaning Critically Imperiled (ACCDC). This population was observed within the Wallace River (ACCDC 2021). Though part of the PDA does cross through the Wallace River secondary watershed, no watercourses were identified within the portion of the PDA in the Wallace River secondary watershed and interactions between this population as a result of the Project is unlikely.

Brook Trout (*Salvelinus fontinalis*) is considered S3 for Vulnerable according to the ACCDC designation. This species can be found in spring-fed, clear, freshwater streams and rivers with lots of cover (Mi'kmaw Conservation Group 2012) Brook Trout will breed in the headwaters of spring-fed streams and rivers with gravelly bottoms in October and November (Mi'kmaw Conservation Group 2012). During the 2021 field surveys, suitable habitat was observed on the Project site as well as direct observations. The ACCDC report additionally indicates that the species can be found within 16 km of the project footprint. Based on these observations it is determined Brook Trout will be present and utilizing the site.

#### *6.2.7.7* Environmentally Sensitive or Managed Areas

Environmentally Sensitive or Managed Areas near the PDA were identified following a review of the ACCDC report (Appendix L) and available mapping.

The ACCDC report identified two managed areas and one environmentally sensitive area within 5 km of the PDA, both are sites associated with the Portapique River Wilderness Area.

The following are areas identified near the PDA that are municipally, provincially or federally protected:

- Important Bird Areas are distinct boundaries that support either a large number of birds, Threatened and Endangered species, or species with restricted ranges or habitat (IBA 2022). Cobequid Bay IBA is located approximately 16 km from the nearest proposed WTG location. This IBA is located along a section of the eastern arm of the Bay of Fundy. At low tide, Its distinct and extensive mud flats, sand flats, and salt marshes provide food for over 1-2 million shore birds as they prepare for migration in the fall (IBA 2022). This area in particular attracts 50-95% of the worlds Semipalmated Sandpipers (Calidris pusilla); a COSEWIC candidate, and many other distinct shorebird populations.

- The Economy River Wilderness Area, approximately 8.8 kilometres to the southwest of the study area.
- Montrose Nature Reserve is a protected area located in the lowlands between Cobequid Bay and the Cobequid Mountains. This area contains old growth Hemlock forest and is located approximately 12.5 km south of the PDA.
- The Wentworth Valley Wilderness and Conservation Areas, approximately 12.8 kilometres to the east of the study area.
- Steepbank Brook Nature Reserve is 202 ha of land located approximately 15.5 km north west of the nearest proposed WTG location. This reserve hosts a population of eastern white cedar, a vulnerable species in Nova Scotia (Mi'kmawey Forestry 2018).
- Portapique River Wilderness Area is 2,050 hectares of old growth Hemlock (Tsuga Canadensis), Red Spruce (Picea rubens), hardwood mixedwood forests (NSE 2017b). This Wilderness Area is approximately 1 km south from the closest proposed WTG location.
- A deer wintering area (DWA) is located approximately 1.8 km from the nearest proposed WTG location. During the winter, White-tailed Deer Deer (Odocoileus virginianus) congregate in high density groups in areas with 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.
- Critical Habitat for the Wood turtle is present within the West Branch of the Wallace River, beginning approximately 3 km from the nearest proposed WTG location, additionally the nearest known record of a wood turtle to the PDA was 10.4 km (ACCDC 2021, Appendix L). As previously mentioned, the portion of the PDA present within the Wallace River secondary watershed consists of an existing road that does not intersect with any watercourses that connect to the West Branch Wallace River.
- The Portapique River is located approximately 3 km south of the PDA and contains freshwater critical habitat for the Inner Bay of Fundy population of Atlantic salmon (Salmo salar pop. 1). Freshwater critical habitat consists of riffles, runs and staging or holding pools found below complete natural barriers (i.e., waterfalls) in the rivers (and tributaries) (DFO 2010). During the 2021 field surveys, suitable fish habitat was identified within a portion of Gleason Brook that intersects within the PDA. Gleason Brook flows south and to the Portapique River. No natural barriers were identified between Gleason Brook and the Portapique River, noting that fish habitat suitability assessments were not conducted beyond 100 m downstream of the PDA (**Section 6.2.6**); therefore; Gleason Brook is being considered as critical habitat for the Inner Bay of Fundy population of Atlantic salmon.

- Mainland Moose Concentration Areas were created by the Nova Scotia Department of Natural Resources in 2012 using maps of preferred habitat, occupied range, and observational data to pinpoint areas of potential occupancy (NSDNR 2012a; NSDNRR 2021). One of these patches determined to be Mainland Moose Concentration Areas is located in the PDA.
- Crown Land Segments, which are directly adjacent to the west of the study area, approximately 500 metres to the east, 900 metres to the south, and 2.3 kilometres to the north of the study area

## 6.3 Socioeconomic VECs

The Project is located on a mixture of blueberry fields, previously forested land and undeveloped forested land in Cumberland County near the communities of Westchester Station, Rose, and Londonderry, and adjacent to Highway 104. Because potential exists for the Project to interact with many communities, the Cumberland Municipal District, shown on Figure 24, was considered as the LAA. The latest Statistics Canada data was reviewed to obtain information on the population and local economy of the Cumberland Municipal District, as well as an overview of the tourism/recreation industry within the area. This allows the Proponent to evaluate how the Project may affect the community and local economy. Background on the area and populations of the municipal district and nearby centres are summarized below.

**Demographic Overview**

In 2016, the population of the Cumberland Municipal District Census Subdivision (CS) was 4,115 (Statistics Canada 2017). Statistics on the population and demographics of the Cumberland Municipal District and Nova Scotia are presented in Table 24.