

**DILLON**  
CONSULTING

**NATURAL FORCES DEVELOPMENT LP**

## **Vegetation and Lichen Appendix 2021-2022**

**Benjamins Mill Wind Project**





December 14, 2022

Natural Forces Developments LP  
Benjamins Mill Wind Project  
1801 Hollis Street, Suite 1205  
Halifax, NS  
B3J 3N4

Attention: Megan MacIsaac

Vegetation and Lichen Appendix: 2021-2022 Vegetation and Lichen Assessment for the Benjamins Mill Wind Project

Dillon Consulting Limited (Dillon) is pleased to provide you with the final report for the Vegetation and Lichen assessments conducted as part of the environmental assessment for the Benjamins Mill Wind Project.

We trust the following meets your present needs. If you have any questions or comments, please contact the undersigned at (902)-450-4000 ext. 5052 at your convenience.

Sincerely,

DILLON CONSULTING LIMITED

A handwritten signature in black ink, appearing to read "Kelly Regan".

Kelly Regan, M.Sc.  
Project Manager, Associate

KSR:lmk  
Enclosure

Our file: 22-4064

137 Chain Lake Drive  
Suite 100  
Halifax, Nova Scotia  
Canada  
B3S 1B3  
Telephone  
902.450.4000  
Fax  
902.450.2008

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## 1.0

# Introduction

Dillon Consulting (Dillon) was retained by Natural Forces Developments Limited Partnership (the Proponent) on behalf of the Benjamins Mill Wind Limited Partnership to complete natural environment surveys in support of the development of a Nova Scotia Environmental Assessment Registration Document (EARD) and associated Addendum for the Benjamins Mill Wind Project (the Project). The Project is being developed and will be owned and operated by the Benjamins Mill Wind Limited Partnership, a partnership between Natural Forces Developments Limited Partnership (referred to herein as the Proponent or Natural Forces) and Wskijnu'k Mtmo'taqtuow Agency Limited (the Agency), a corporate body wholly owned by the 13 Mi'kmaw bands in Nova Scotia. Natural Forces acts on behalf of the Benjamins Mill Wind Limited Partnership for many aspects of Project development.

The proposed Project consists of up to 28 wind turbine generators (WTGs) capable of producing up to 150 MW of renewable energy that will be connected to the existing Nova Scotia Power transmission grid via an overhead transmission line, as well as a substation (Figure 1). The Project is located in an undeveloped fragmented forested area in Hants County near the communities of Smiths Corner and Falls Lake. The WTGs are proposed to be located in areas that have been previously clear-cut through forestry activities, creating a highly fragmented habitat.

The proposed project is located in an area where vegetation and lichen are present. Vegetation and lichens are considered important features and valued environmental components (VECs because they are valued in their relationship with other wildlife and wildlife habitat, including other biological and physical components addressed as VECs in this environmental assessment (EA). Natural environment surveys for the Project were conducted for VECs that were identified based on an understanding of the environmental features of the proposed project area, the nature of the Project, and the potential interactions that may occur between the proposed project and the environment/VECs.

Taking into consideration the objectives of the EARD, this report provides an effects assessment on vegetation and lichen, and includes: a brief description of the proposed project; a description of the scope and methodology used for the vegetation and lichen surveys, a summary of the survey results, and, an assessment of residual effects (including potential interactions and mitigation) of the proposed project on vegetation and lichens.

## 1.1

## Background

The Project is located in an undeveloped fragmented forested area in Hants County near the communities of Smiths Corner and Falls Lake (Figure 1). The Project site was selected due to the existing anthropogenic land uses and impacts over these areas, in order to minimize impacts to undeveloped lands as much as feasible. The wind turbine generators (WTGs) are proposed to be located in areas of highly fragmented habitat, due to previous clear-cutting and forestry activities. The Project has the

potential to transform this disturbed habitat into a site that will provide an environmentally friendly and productive source of renewable energy for Nova Scotia while limiting potential impacts to the environment.

Development of wind energy projects has been instrumental in reducing harmful greenhouse gases associated with traditional carbon-based energy sources, both locally and abroad. Further, as previously mentioned, the Nova Scotia provincial target is to produce 80% of its energy from renewable sources by 2030. With less than a decade until this deadline, the development of wind energy is the most feasible option to help meet renewable energy goals while providing economic development for local communities.

The regional vegetation of the South Mountain eco-district is generally dominated by Acadian forest tree species. Locally, the site consists of two eco-elements; the Spruce Hemlock Pine Hummocks and Hills eco-element, and the Red and Black Spruce Hummocks eco-element (NSDLF 2019). The majority of the site is covered by the Spruce Hemlock Pine Hummocks and Hills eco-element, which consists of well drained coarse grained soils. This eco-element is dominated by Red Spruce (*Picea rubens*), Eastern Hemlock (*Tsuga canadensis*) and Eastern White Pine (*Pinus strobus*) in areas with slightly moist soils; and by Eastern White Pine, Red Oak (*Quercus rubus*) and Red Pine (*Pinus resinosa*) on the drier hilltops. The remaining portions of the site, which tend to be wetter and consist of imperfectly drained course-grained soils (NSDLF 2019), are characterized by the Red and Black Spruce Hummocks eco-element. This eco-element includes late successional shade-tolerant softwoods, such as Red Spruce and Eastern Hemlock, along with Eastern White Pine (NSDFL 2019).

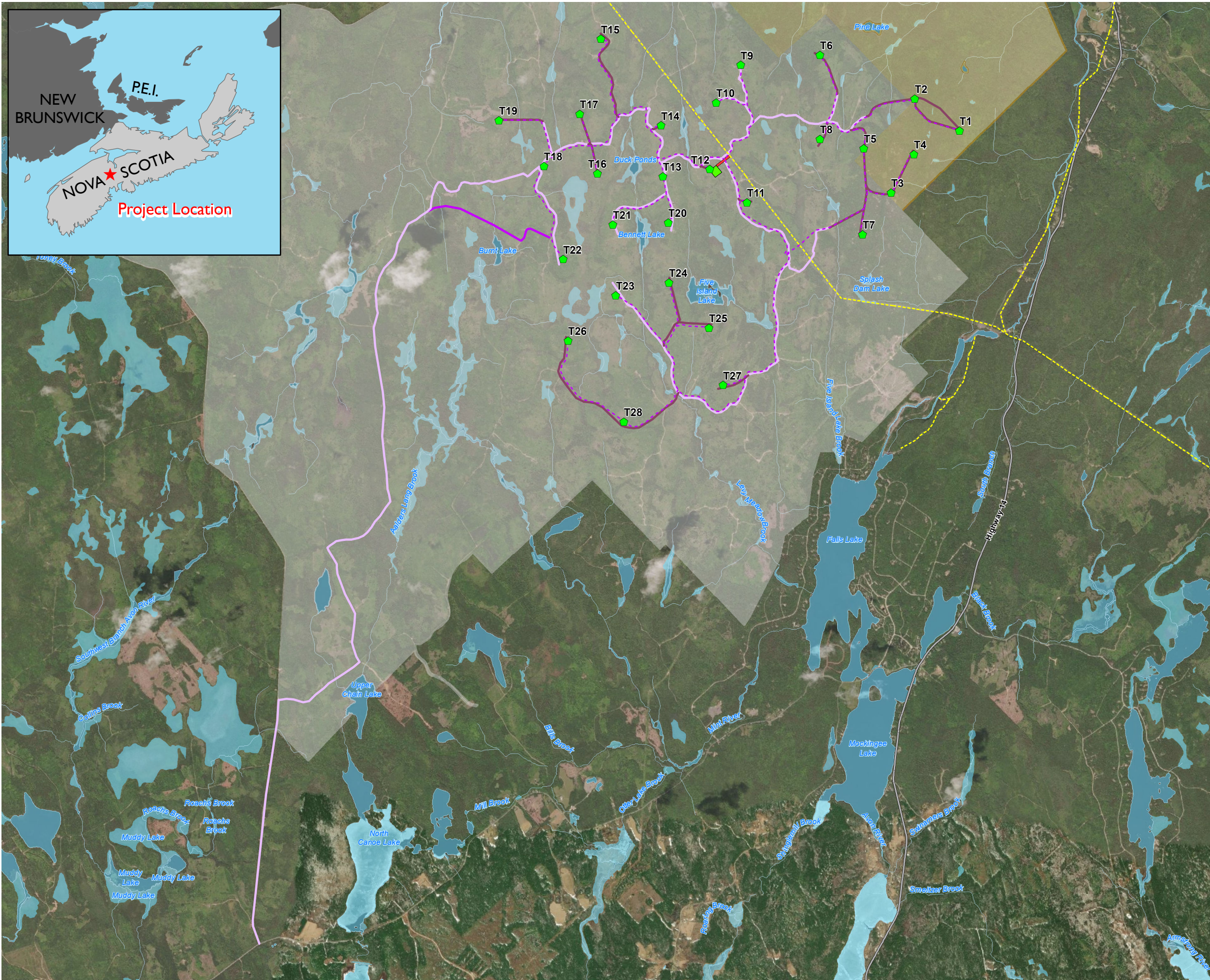
Vegetation and lichen considers vegetation communities and habitats that support species at risk, wildlife, plants, and lichens. The vegetation components of terrestrial habitats include plant and lichen species within the assessed area. Vegetation and lichens were selected as VECs because of their relationship with species at risk, migratory birds, bats and other biological and physical components.

## 1.2 Purpose and Objectives of the Report

This report provides a summary of the vegetation and lichen surveys that were conducted as part of the biophysical surveys undertaken in support of the Project EA registration. The report includes:

- Brief description of the Project;
- Description of the scope and methodology used for assessments;
- The results of the desktop and field assessments; and,

An assessment of residual effects (including potential interactions and mitigation) of the proposed Project on vegetation and lichens.

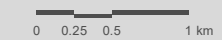


BENJAMINS MILL PROJECT

**PROJECT LOCATION AND SITE LAYOUT**

FIGURE 1

- Proposed Turbine Location
- Proposed Substation Location
- Crown Land
- Privately Owned Land
- Proposed Collector Network
- Roads to be Upgraded
- Proposed Access Road
- Proposed Alternative Access Road
- Proposed Interconnection Line
- Transmission Line
- Highway
- Watercourse
- Waterbodies



SCALE 1:50,000



MAP DRAWING INFORMATION:  
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MAP CREATED BY: DU  
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## 2.0

## Project Description

The following is a high-level summary of the Project. Please refer to the Benjamins Mill Wind Project Environmental Assessment Registration Document Addendum (the Addendum) dated December 2022 for further information.

The Benjamins Mill Wind Project (the Project) is located in Hants County, Nova Scotia, approximately 10 km southwest of Windsor, Nova Scotia. The Project is proposed to have an installed capacity of up to 150 MW, amounting to up to 28 wind turbine generators and associated infrastructure, including an electrical substation, collector lines, and overhead transmission line (Figure 1).

The Project will be located predominantly on privately-owned land with only four wind turbine generators (WTGs) located on provincial Crown lands near Highway 14. The privately-owned site lands have undergone several generations of wood harvesting and have a network of existing forestry roads. The provincial Crown lands are largely undisturbed with few existing roads that access the property. In addition, the Project site met crucial factors that determined suitability, which included features such as the strength and consistency of the wind resources and its proximity to existing electrical and civil infrastructure. The Project site was selected due to the existing mixed anthropogenic land uses and historical anthropogenic impacts in these areas, in order to minimize impacts to undeveloped lands to the extent feasible.

The purpose of the Project is to contribute to Nova Scotia achieving their renewable electricity targets through the generation of clean and renewable energy. Not only will this have environmental benefits, but will also reduce Nova Scotia's reliance on imported energy sources through the development of a localized renewable energy generation (Renewable Electricity Regulations 2021).



## 3.0 Scope of Work

Vegetation and lichens were selected as a VEC because they are valued in their relationship with wildlife and wildlife habitat, and other biological and physical components addressed as VECs in this EA. In addition, plant Species at Risk (SAR) are protected under federal and provincial legislation pursuant to the federal Species at Risk Act (SARA) and the Nova Scotia Endangered Species Act (NSESA). SAR and other rare plant species are considered valued, including species of conservation concern (SoCC) as identified as “extremely rare” (S1), “rare” (S2) or “uncommon” (S3), if they are present (AC CDC 2022).

To better understand the types and quality of habitat in the area of the proposed project, a baseline study of vegetation and vegetation communities was conducted for the proposed Project over two years (2021 and 2022).

The scope of work for the vegetation and lichen surveys is based upon an understanding of the nature of the proposed Project and Project area, as well as the field biologists’ experience in assessing similar landscapes. The scope of work also considered feedback from the regulatory consultation process and guidance provided through the “Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia” (NSE 2021). The following scope of work included two years of data collection and was completed as part of the vegetation and lichen surveys for the Project:

- An initial desktop assessment of habitats within the Local Assessment Area (LAA);
- A desktop assessment of vegetation and lichen SAR and SoCC with the potential to occur within the Potential Development Area (PDA);
- A survey of vegetation species present within the LAA by terrestrial habitat type, along with their AC CDC sub-national rarity ranking (i.e., S-Rank), that have the potential to be affected by the Project’s activities;
- A survey of lichens present within the LAA by terrestrial habitat type, along with their regional rarity ranking, that have the potential to be affected by the Project activities;
- A survey of vegetation of cultural or traditional importance from a Mi’kmaq knowledge/use perspective that have the potential to occur in the Project site, as identified by a terrestrial biologist from Maqamigew Anqotumeg; and,
- Incidental observations of vegetation, including SAR, SoCC, and invasive species documented during the 2021 and 2022 biophysical field surveys.

### 3.1 Spatial Boundaries

For the purpose of the vegetation and lichen surveys conducted as part of the biophysical baseline for the Project, the spatial boundaries included the PDA, the Study Area and the LAA (Table 1, Figure 2). The LAA, which is described below in Table 1, encompasses the terrestrial habitats located adjacent to the PDA for the assessment of vegetation and lichen species that are most likely to be impacted by the







Project (i.e., a buffer of 50 m). Around turbine bases, substations and ancillary equipment, the LAA includes a larger buffer (i.e., 150 m) to assess current disturbances and understand the potential effects of the Project on terrestrial habitats.

**Table 1: Spatial Boundaries for the assessment of Vegetation and Lichens**

Assessment Area	Definition	Purpose of Boundary
Potential Development Area	Area encompasses the Project footprint and a buffer of 15 m on either side of shoulders of the roadways (either existing or new) and collector lines and transmission line, a 75 m buffer around the base of each turbine location, and a 25 m buffer around the substation.	Represents the extent of all anticipated areas that could undergo physical disturbance associated with the Project. This area encompasses all of the proposed 28 turbines locations and their associated infrastructure.
Study Area	The GPS tracks of meander and transect-based search areas within the LAA targeting representative habitats.	The area covered on foot during surveys. Observations in the study area are applied to understand potential effects of the Project on the LAA.
Local Assessment Area	Area includes a 50 m buffer on either side of roads required to access turbine sites during construction and operation and along powerline easements as well as a 150 m around turbine bases, substations and ancillary equipment.	The maximum area where Project-specific environmental interactions can be predicted and measured with a reasonable degree of accuracy and confidence (i.e. the zone of influence of the Project phases on each VEC).

**STUDY AND LOCAL ASSESSMENT AREA FOR VEGETATION AND LICHENS**

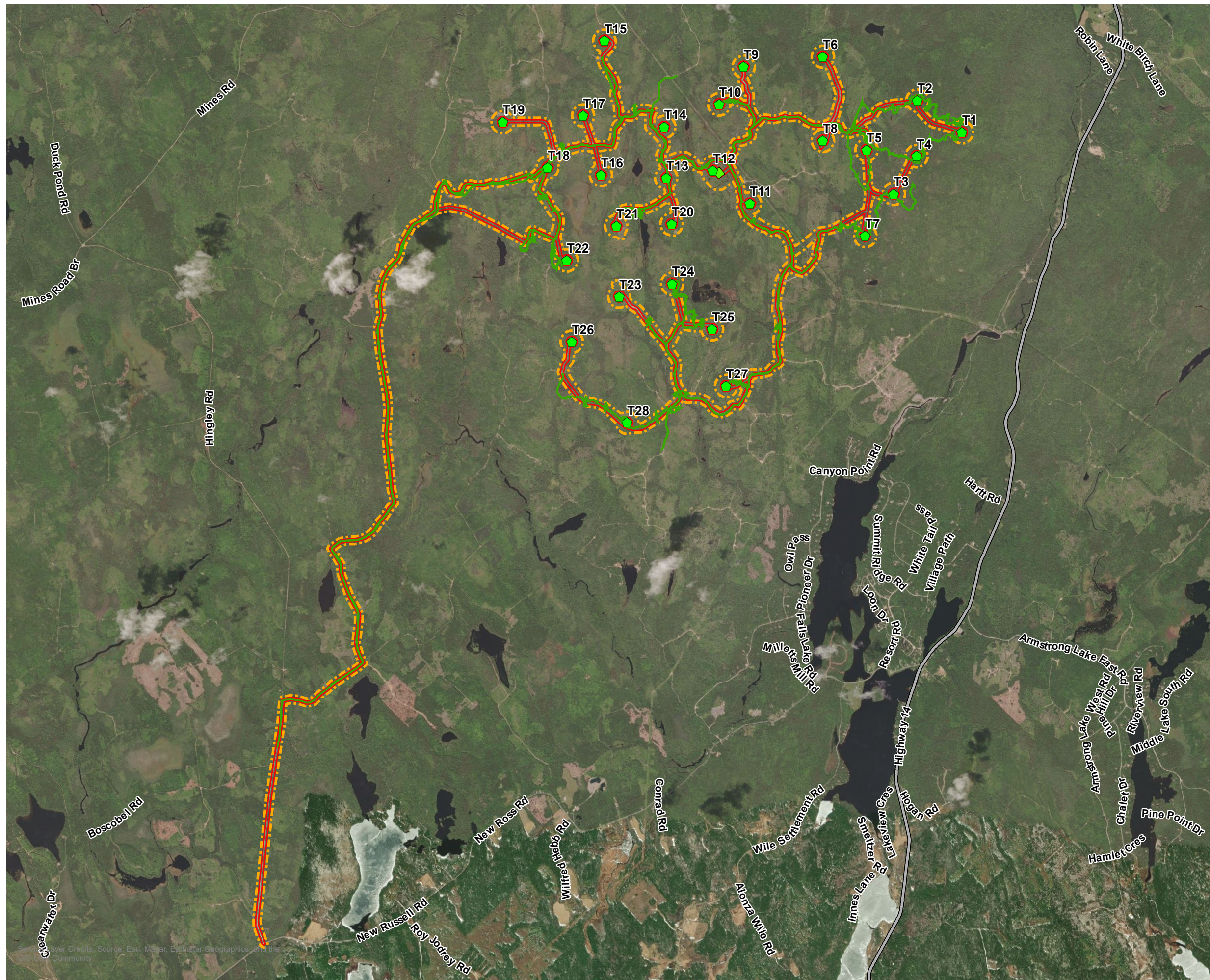
FIGURE 2

-  Proposed Turbine Location
-  Proposed Substation Location
-  Potential Development Area (PDA)
-  Local Assessment Area
-  Highway
-  Plant Survey Tracks



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## 4.0 Methods

### 4.1 Desktop Habitat Assessment

Prior to completing the field assessments for vegetation and lichens, Dillon conducted a desktop review to evaluate the potential for vegetation and lichen species within the LAA and to assist in scoping the field program. The information was reviewed, along with information on habitats present in the general area of the Project to determine potential for at risk flora species and/or their critical habitat. Dillon completed a review of available resources prior to completing the field surveys, which included the following:

- Data from 2021 and 2022 Atlantic Canada Conservation Data Centre (AC CDC) reports;
- Publicly available GIS map layers (e.g., ecological land classification, forest and non-forest inventory, wetland inventory, Protected Natural Areas, Wildlife Management Zones); and,
- Google Earth satellite imagery.

Available mapping through the Nova Scotia Department of Natural Resources and Renewables (NSDNRR) was reviewed to identify forest types, general land use, and habitats within the LAA. Observations gathered during the biophysical assessments carried out for this EA and aided by Google Satellite imagery were used to confirm the existing site conditions within the PDA. A GIS map was generated to show the existing habitat and land use features within the PDA and calculate the area of potential disturbance within each type.

### 4.2 Field Assessments

Field vegetation surveys were completed in 2021 and 2022 to identify and target the major habitat types within the vegetation LAA. Representative areas of the redesigned Project layout were surveyed for vegetation and lichens in 2022. Vegetation and lichen surveys consisted of random meander searches through major habitat types by biologists skilled at vegetation and lichen identification. Observations of vegetation and lichen SAR and SoCC were reported on an incidental basis in concert with other targeted field surveys (i.e., wetlands, watercourses, and wildlife and wildlife habitat) throughout the growing season (e.g., June – September) in both 2021 and 2022.

#### 4.2.1 Vegetation Assessment

Dedicated plant surveys were conducted on July 8, August 11 and August 12, 2022 by experienced plant identification specialists, as summarized in Table 2. GPS locations and tracks of the random meander paths of the plant specialists were recorded and are presented on Figure 2. At the discretion of the professionals conducting the plant and lichen assessments, the search areas were expanded beyond the LAA boundary to incorporate adjacent suitable vegetation or lichen habitat or for ease of access between segments of the LAA. Additionally, terrestrial habitat and vegetation observations were

reported on an incidental basis in concert with other targeted field surveys (i.e., wetlands, watercourses, and wildlife and wildlife habitat) throughout 2021 and 2022.

**Table 2: Summary of Dedicated Plant Field Surveys**

Date	Surveyed Area	Survey Lead
July 27 - August 7, 2021	Hardwood forest Softwood Forest Mixedwood forest Cut/Disturbed Areas Wetlands	C. Kennedy and C. Pepper
July 8, 2022	Mixedwood Regeneration	C. Kennedy
August 11-12, 2022	Cutover Mature Mixedwood Wetlands Hardwood forest Regeneration	D. Cormier

#### 4.2.2 Lichen Assessment

Targeted lichen surveys were conducted site wide in habitats with available epiphytic lichen habitat (e.g., forested wetlands with mature trees and upland habitats with mature hardwood trees) between April 27, 2021 and May 5, 2021 by a botanist experienced in lichen identification as recognized by NSDNRR. A random meander search through medium to mature mixed forested areas was conducted on September 9, and November 10, 2022 for potential epiphytic lichen species.

Similar to the vegetation surveys, GPS locations and tracks of the random meander paths of the lichen specialists were tracked throughout the dedicated surveys. Additionally, terrestrial habitats and observations of rare lichens were reported on an incidental basis in concert with other targeted field surveys (i.e., wetlands, watercourses, and wildlife and wildlife habitat) throughout 2021 and 2022.

#### 4.3 Vegetation Species at Risk Assessment

The proposed PDA will span several landscapes and include areas that have the potential for vegetation SAR and SoCC. For the vegetation and lichen assessment, as with the other biophysical surveys conducted for the Project EA, the following definitions of SAR and SoCC apply:

- **Species at Risk (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), NSESA, or the federal SARA; and,
- **Species of Conservation Concern (SoCC):** Those species that are not SAR but are identified as regionally vulnerable or imperilled by the Atlantic Canada Conservation Data Centre (AC CDC) (i.e., those species with AC CDC S-ranks of S1: Critically imperilled in province; S2: Imperilled in province; and S3: Vulnerable in province of Nova Scotia.

To evaluate the potential for vegetation SAR and SoCC within 10 km of the Project, Dillon completed a review of the following sources and data lists for the purpose of characterizing existing conditions at the Project site:

- Custom Atlantic Canada Conservation Data Centre reports (AC CDC 2021 and AC CDC 2022);
- The federal SAR public registry (GOC 2022a);
- The provincial Endangered Species registry (NSDNRR 2022);
- Publicly-available governmental Geographic Information Systems (GIS) map layers and databases; and,
- Nova Scotia Provincial Landscape Viewer mapping resource.

#### 4.4

### Assessment of Culturally Significant Vegetation

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A non-exhaustive vegetation list of cultural importance for the Mi'kmaq bands in Nova Scotia was prepared by a terrestrial biologist from Maqamigew Anqotumeg. The list was established following a desktop analysis of the site and includes vegetation species that are culturally significant to the Mi'kmaq bands in Nova Scotia and are believed to likely be present within the LAA of the Project. The plant list compiled from surveys conducted in 2021 and 2022 was cross-referenced with this assessment to identify plants of cultural importance that are present within the PDA.

Although the Proponent was supportive of engaging an Indigenous monitor to complete a site walk-over to identify any culturally-significant vegetation species that could be impacted by the Project, one could not be identified due to timing constraints and COVID-19 health and safety considerations.

## 5.0 Results

During the vegetation and lichen surveys, a total of 315 species were observed and include 259 vascular plants, and 69 lichen species. The desktop and field results of these surveys are described below.

### 5.1 Desktop Survey and Habitat Assessment

Available mapping through the NSDNRR was reviewed to identify forest types, general land use, and habitats within the LAA are shown on Figure 3. Furthermore, the area and percentage covered by each habitat or land use type within the PDA were determined and are listed in Table 3. This data is based on available mapping and Google Satellite imagery.

The Project layout was designed to minimize the disturbance of naturalized areas by prioritizing development in areas with existing anthropogenic disturbance. Some areas within the proposed footprint for the Project will extend through less disturbed habitat types, including areas with mature trees, wetlands, and watercourses.

Approximately 34% of the PDA is located within areas that have been previously disturbed by forestry, recreational trails and access roads, the remaining 66% of the PDA will be developed within existing forest habitat, as summarized in Table 3. It is noted that the PDA was conservatively define (see Table 1, above) and includes areas that are unlikely to be directly impacted by the Project (e.g., areas below collector lines that will be spanned using poles and buffered areas extending from the shoulders of access roads etc.).

**Table 3: Habitats within the Potential Development Area**













Habitat	Area within the PDA (ha)*	Percentage of the PDA*
Hardwood-dominant Forest	43	15%
Mixedwood Forest	67	23%
Softwood-dominant Forest	78	27%
Non-forested Wetlands	1	<1%
<b>Total Non-Disturbed Areas<sup>3</sup></b>	<b>188</b>	<b>66%</b>
Recently Cut Area or Regenerating Wood Lot	68	24%
Forestry Access Roads (Existing)	28	10%
Other (includes gravel pit and corridors)	1.5	<1%
<b>Total Area with Anthropogenic Disturbance</b>	<b>98</b>	<b>34%</b>

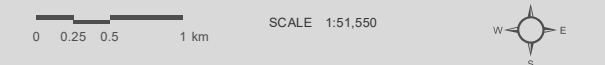
**Notes:**

1. Area calculations are estimates and are based on NSDNRR mapping and observations recorded at the site during the 2021 and 2022 biophysical surveys;
2. As previously described, the PDA encompasses all of the proposed 28 turbines locations and their associated infrastructure.
3. Non-disturbed habitats include treated and un-cut forestry stands and plantations.

**VEGETATION AND LICHEN HABITAT ASSESSMENT**

FIGURE 3

-  Proposed Turbine Location
  -  Proposed Substation Location
  -  Potential Development Area (PDA)
  -  Local Assessment Area
  -  Highway
  -  Watercourse
  -  Waterbodies
- Habitat Type**
-  Softwood - Dominant Forest
  -  Mixedwood - Wood Forest
  -  Hardwood - Dominant Forest
  -  Non-Forested Wetlands
- Anthropogenic Land Use**
-  Recently Cut Area or Regenerating Wood Lot

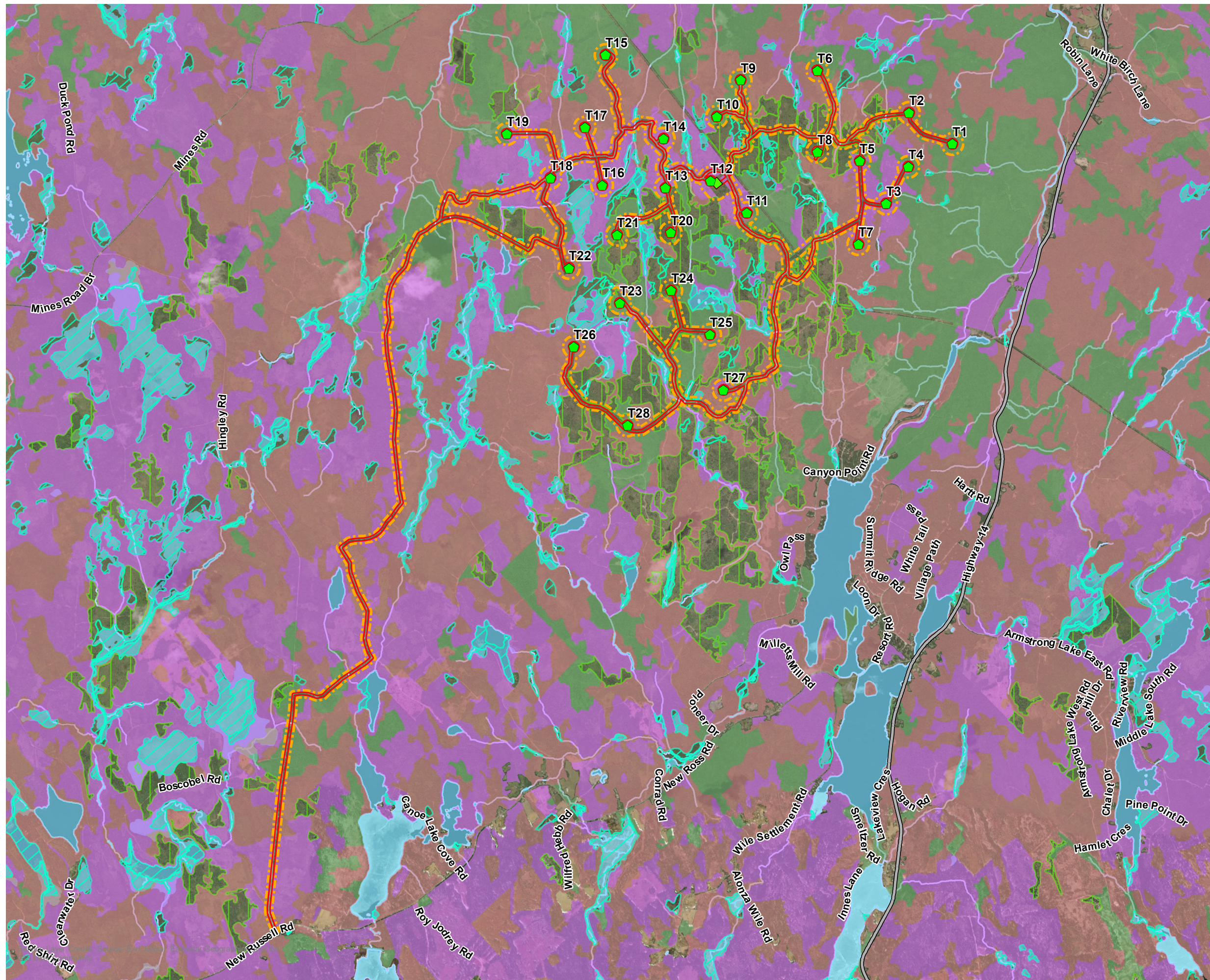


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MAP PROJECTION: NAD 1983 UTM ZONE 20N



PROJECT: 21-1329  
STATUS: DRAFT  
DATE: 2022-12-14





## 5.2 Field Surveys

### 5.2.1 Plant Surveys

Plant communities were inventoried in the field by Dillon biologists skilled in the identification of common and rare plant species of Nova Scotia. The vascular plant inventory for the LAA was completed during the site visits during the growing seasons of 2021 and 2022. Vegetation surveys for the PDA was completed during the site visits on July 8, August 11 and 12, 2022. Vegetation surveys consisted of random meander searches through major habitat types by experienced botanists. Additionally, a characterization of land cover was derived from the field inventories and then further refined during the compilation of plant species lists. The following habitat types were identified in the LAA: hardwood-dominant forests, softwood-dominant forests, mixedwood forests, previously cut disturbed areas, bogs and fens, and swamps and marshes. Representative photos from the identified habitats are included in Appendix B. A total of 259 plant species were identified during the 2021 and 2022 field surveys, and are compiled in Table A1.

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

#### **Hardwood-dominant Forests**

Hardwood forests are characterized by temperate trees and understory flora, high species richness, diverse stand structures, and require rich and well drained soils (NSDFL 2021a). This habitat type was the least-common encountered and was generally limited to the Crown Land Property which has not been harvested as frequently as the privately-owned resource land parcels. The hardwood forest habitat encountered during the 2021 and 2022 vegetation surveys was dominated by red maple and included a diverse understory of mostly herbaceous plants. Only one SoCC was observed during 2021 and 2022 surveys in hardwood-dominant forest habitat types: American Beech (*Fagus grandifolia*; listed as S3S4). Several culturally-significant plants were identified within the hardwood forest habitat include: American beech (Suomusi), dwarf red raspberry (Katomin), eastern white pine (Kuow), partridge berry (Ka'qaujumnaqsi), pin cherry (Maskwe'simanaqsi), red elderberry (Pukulu'skwimanaqsi), red raspberry (Klitaw), red spruce (Mekwe'k kawatkw), striped maple (Wapoq), sugar maple (Snaweyey), wild sarsaparilla (Wopapa'kjukal), and yellow birch (Nimnoqn). Dominant vegetation within the hardwood forest habitats of the terrestrial LAA included:

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

### Softwood-dominant Forests

Softwood-dominant forests are common in areas previously disturbed by fire or wind throw (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, and/or jack), a shrub layer dominated by ericaceous species (i.e., lambkill, blueberry and huckleberry), along with black spruce regeneration, and an herb cover may be present but is dependent on the amount of light reaching the ground (NSDFL 2021). No SAR or SoCC vegetation were identified in softwood-dominant forests during 2021 or 2022 survey. Several culturally significant plants were identified within the softwood forest habitat, and included: American mountain ash (Epsimusi), creeping snowberry (Kna'ji'j), blueberry (Pkwiman), pin cherry (Maskwe'simanaqsi), wild sarsaparilla (Wopapa'kjukal), and sheep laurel (no associated Mi'kmaq name provided). Dominant vegetation observed within softwood forests included the following:

- Softwood trees (e.g., black spruce and Balsam fir);
- Woody shrubs (e.g., blueberry, smooth service berry, rhodora and juniper); and,
- Depending on the presence of open spaces, some locations had an understory of fern, grasses and asters, and other hardy flowering plants (i.e., northern starflower, painted trillium, wild sarsaparilla).

### Mixedwood Forests

Mixedwood forests are tree-dominated landscapes that contain both softwood and deciduous trees (NSDLF 2021). A single vascular SoCC (American Beech, *Fagus grandifolia* – listed as S3S4) as well as several lichen SAR/SoCC were identified within the mixedwood forests during the 2021 and 2022 vegetation and lichen surveys at the Project site (Figure 4). A complete list of vegetation and lichens identified during the surveys, along with their conservation status (as of October 2022), is included in Appendix A. A list of the SAR and SoCC lichen species are detailed below in Section 5.3. Several culturally significant plants identified within the mixedwood forest habitat include: American beech (Suomusi), American mountain ash (Epsimusi), beaked hazlenut, (Mlipkanjmusi), creeping snowberry (Kna'ji'j), eastern white pine (Kuow), goldthread (Wisawkweski), northern wild raisin (Skinaqanmusi), partridge berry (Ka'qaujumnaqsi), red spruce (Mekwe'k kawatkw), sheep laurel (for which no associated Mi'kmaq name was provided), striped maple (Wapoq), sugar maple (Snaweyey), blueberry (Pkwiman), wild sarsaparilla (Wopapa'kjukal), and yellow birch (Nimnoqn). Dominant vegetation within mixedwood forests included the following:

- A diverse tree overstory that varied between landscapes. Dominant deciduous trees included maples (i.e., red, striped, sugar and mountain), American beech, white ash, and paper and yellow birch. Dominant softwood tree species included eastern white pine, spruce (white, red and black) and Balsam fir;
- Woody shrubs (e.g., blueberry, smooth service berry, American witch-hazel, northern wild raisin, rhodora and juniper); and,
- Herbaceous understories were variable and depended on the available light and open spaces in the tree canopy.

### Clear Cut or Previously Cut-Over Areas

This category includes all regenerating habitat that has been recently or historically harvested for forestry products. The majority of the PDA is anticipated to fall within this habitat type. No vegetation SAR or SoCC were identified within previously cut lands during the 2021 or 2022 vegetation surveys at the Project site. Several culturally significant plants identified within the previously cut lands included: blackberry (Ajiqjimanaqsi), American mountain ash (Epsimusi), common plantain (Wijikanipki), creeping snowberry (Kna'ji'j), eastern white pine (Kuow), blueberry (Pkwiman), northern wild raisin (Skinanqanmusi), pearly everlasting (Wapwasuek), pin cherry (Maskwe'simanaqsi), red raspberry (Klitaw), red spruce (Mekwe'k kawatkw), wild strawberry (Atuomkoinaqsi) and yellow birch (Nimnoqn), as well as common yarrow, Harlequin blue flag, sheep laurel and sweet fern (for which no associated Mi'kmaq names were provided). Dominant vegetation within clear cut or previously cut-over areas included the following:

- A diverse tree over story that varied between landscapes. Dominant deciduous trees included red maple, trembling aspen, American mountain ash, paper and grey birch, white poplar, northern red oak, and Bebs willow. Dominant softwood tree species included eastern white pine, spruce (white and red) and Balsam fir; and,
- Diverse assemblages of herbaceous plants including several weeds.

### Bogs and Fens

Bogs and fens typically consist of peatlands saturated with water. Bog vegetation may or may not include trees and are usually covered with Sphagnum spp. and ericaceous shrubs. The vegetation of fens is more diverse than in bogs and generally consists of sedges and mosses and shrubby trees (NSE 2021). No vegetation SAR or SoCC were identified within bogs or fens during the 2021 or 2022 vegetation surveys at the Project site. Culturally significant plants identified with bogs and fens habitat included sheep laurel (no associated Mi'kmaq name provided) and creeping snowberry (Kna'ji'j). Dominant vegetation within bogs and fens included the following:

- Woody shrubs (i.e., leatherleaf, sheep laurel, rhodora and sweet grass);
- Herbaceous plants (i.e., northern pitcher plant, three-leaved false soloman's seal, Virginia St. John's-wort, asters and other ferns, grasses and sedges); and
- Trees (when present) included black spruce and hardwood trees (i.e., red maple and paper birch).

### Swamps and Marshes

Swamps and marshes 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 often contain grasses, sedges ferns and rushes in open areas. Marshes, which are typically wetter than swamps, typical host emergent aquatic plants (macrophytes) such as rushes, reeds, grasses and sedges, as well as floating and submerged aquatic macrophytes, and non-vascular plants. Only one SoCC was observed during the 2021 and 2022 surveys in swamp and marsh habitat types: American Beech (*Fagus grandifolia*; listed as S3S4). Several culturally significant plants identified within swamps and marsh habitat including: American

beechnut (Suomusi), creeping snowberry (Kna'ji'j), eastern white pine (Kuow), goldthread (Wisawkweski), northern wild raisin (Skinaganmusi), partridge berry (Ka'qaujumnaqsi), red raspberry (Klitaw), blueberry (Pkwiman), wild sarsaparilla (Wopapa'kjukal); and sheep laurel (for which no associated Mi'kmaq name was provided). Dominant vegetation within swamps and marshes included the following:

- Woody shrubs (including speckled alder, smooth service berry, mountain holly, Canada yew, red raspberry, and sheep laurel);
- Herbaceous plants (including water horsetail, white meadow sweet, asters and other grasses and sedges); and,
- Trees (when present) included softwoods (i.e., black spruce, Balsam fir, and eastern white pine) and hardwood trees (i.e., red maple and American beech).

### 5.2.1.2 Invasive Vegetation

Plant specialists documented the presence of invasive species that were encountered during the vegetation surveys and other biophysical surveys conducted between 2021 and 2022 for the proposed Project. A summary of the invasive species found in the terrestrial LAA during the 2021 and 2022 field surveys is presented in Table 4. For this assessment, invasive species are species that have been introduced into areas beyond their native range and negatively impact the environment, the economy, or society (Nova Scotia Invasive Species Council 2021). Numerous species of exotic plants that are typically considered weeds and are common in Nova Scotia were identified within the LAA, particularly in disturbed areas and along road sides. It is important to note that not all exotic plant species in Nova Scotia are anticipated to take over natural habitat areas.

**Table 4: 2021 and 2022 Invasive Vegetation Species Found in the Benjamins Mill Terrestrial LAA**

Common Name	Scientific Name	Description	Habitat at Benjamins Mill Site
Common Hawkweed	Hieracium lachenalii	Considered highly invasive in woodlands, fields, and roadsides. <sup>2</sup>	Softwood-dominant forests and other anthropogenic disturbed areas
Common St. John's-Wort	Hypericum perforatum	Inhabits agricultural areas, forest openings, and meadows. May poison livestock, but is of low concern. <sup>1</sup>	Agricultural areas, forest openings and meadows
Oxeye Daisy	Leucanthemum vulgare	Invasive – crowds out native plants in disturbed areas; of moderate concern. <sup>1</sup>	Blueberry fields and other anthropogenic disturbed areas
Norway Spruce	Picea abies	Potential concern as an invasive – can form dense evergreen canopies in deciduous forests. <sup>1</sup>	Softwood-dominant forests, plantation/Blueberry fields and other anthropogenic disturbed areas

Notes:

1. Canadian Wildlife Federation 2022.

2. King County. 2018.

### 5.2.2 Lichen Surveys

Lichens were inventoried in the field by Dillon biologists skilled in the identification of common and rare lichen species of Nova Scotia. Over the two years of biophysical surveys, 69 lichen species were inventoried, including one SAR and five SoCC. Details and locations of SAR and SoCC lichens are provided below in Section 5.3.

Targeted lichen surveys of mature forest habitats within the LAA for lichens was conducted in April and May 2021 and in September and November 2022. The lichen species identified during the flora and other biophysical surveys conducted between 2021 and 2022 are compiled in Table A2.

## 5.3 Vegetation Species at Risk Assessment

### 5.3.1 AC CDC Data Review

Custom ACCDC reports were obtained with a focused list of 5 km from PDA in 2021 and 2022 (ACCDC 2021, 2022). Due to the size of the PDA, a search of the ACCDC was requested to include a search radius of 10 km from the PDA centre in 2021 and 2022. For information purposes, the custom AC CDC report includes search results from a 100 km radius around the PDA (AC CDC 2022), however, only documented rare, SoCC (i.e., species with S-ranks of S1, S2, or S3), or SAR within 10 km were included in the results. The AC CDC report (AC CDC 2022) included 20 historical records of rare plant species; of which seven were vascular plant species and thirteen non-vascular plants (Table 5). Only one recording of a SAR was identified: Black-foam Lichen (*Anzia colpodes*). All priority flora species within 10 km of the PDA center are listed in Table 5.

Black-foam Lichen (*Anzia colpodes*) is listed as threatened by COSEWIC and is not common in Nova Scotia. The lichen is a leafy lichen that grows in rosettes across the trunks of mature deciduous trees and requires moisture supplied by nearby wetlands or watercourses. Although potential for habitat that this lichen is present within the LAA (e.g., in mature hardwood forest stands the vicinity of wetlands, lakes, and streams), none was observed during the lichen surveys or incidentally during other biophysical surveys conducted between 2021 and 2022.

**Table 5: Rare and/or Endangered Flora within 10 km of PDA Centre (AC CDC 2022)**

Common Name	Scientific Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)	Distance from PDA Centre (km)
Black-foam lichen	Anzia colpodes	S3, SARA: T COSE: T NSESA: V	5.3 ± 0.0
Eastern candlewax lichen	Ahtiana aurescens	S2S3	5.1 ± 2.0
Daisy-leaved moonwort	Botrychium matricariifolium	S3S4	9.0 ± 10.0
Silvery-flowered sedge	Carex argyrantha	S3S4	7.7 ± 1.0
Lesser sulphur-cup lichen	Cladonia deformis	S2S3	7.7 ± 4.0
Mixed-up pixie-cup	Cladonia mateocyatha	S2S3	4.0 ± 6.0
Salted shell lichen	Coccocarpia palmicola	S3S4	5.1 ± 0.0
Blistered tarpaper lichen	Collema nigrescens	S3	5.3 ± 0.0
Drummond moss	Drummondia prorepens	S3?	8.6 ± 5.0
Valley oakmoss lichen	Evernia prunastri	S3S4	4.5 ± 2.0
Corrugated shingles lichen	Fuscopannaria ahlneri	S3	5.3 ± 0.0
Muehlenbeck's bryum moss	Imbribryum muehlenbeckii	S1?	3.9 ± 0.0
Acadian jellyskin lichen	Leptogium acadense	S3S4	9.3 ± 0.0
Fertile shield lichen	Parmelia fertilis	S2S3	5.3 ± 0.0
Black rock-wafer lichen	Phylliscum demangeonii	S2?	5.2 ± 0.0
Hooker's orchid	Platanthera hookeri	S3	3.9 ± 0.0
Large round-leaved orchid	Platanthera macrophylla	S2	6.5 ± 1.0
Leathery moonwort	Sceptridium multifidum	S3S4	5.3 ± 10.0
Dwarf bilberry	Vaccinium cespitosum	S3S4	4.2 ± 0.0
Blue vervain	Verbena hastata	S3S4	6.4 ± 7.0

Notes:

S-rank refers to the Sub-national (Provincial) rank provided by the AC CDC and includes the following: S1 Critically Imperiled, S2 Imperiled, S3 Vulnerable, S4 Apparently Secure, S5 Secure and SU Unrankable.

T: Threatened V: Vulnerable

### 5.3.2

#### Lichen and Plant SAR and SoCC

During the 2021 and 2022 field seasons, the locations of flora and lichen SAR and SoCC were recorded within the LAA and are shown on Figure 4. One SAR lichen, five SoCC lichen and two SoCC vascular plants were identified during biological field surveys.

Frosted Glass-whiskers (*Sclerophora peronella*) is a small arboreal lichen that is listed as Special Concern under SARA and COSEWIC and ranked by AC CDC as S3S4 (vulnerable/apparently secure) in Nova Scotia. A protected zone within a 100 m radius of the observed location of the lichen is required based on NSDNRR At-Risk Lichens-Special Management Practices (NSDNRR, 2018). The project layout was revised to accommodate the buffer for the protection of this SAR lichen following its identification in 2021.

The following lichen SoCC were identified between 2021 and the LAA for vegetation and lichens:

- **Acadian Jellyskin Lichen** (*Leptogium acadiense*) is ranked by AC CDC as S3S4 (vulnerable/apparently secure) in Nova Scotia;
- **Blistered Tarpaper Lichen** (*Collema nigrescens*) is ranked by AC CDC as S3 (vulnerable) in Nova Scotia;
- **Eastern Candlewax Lichen** (*Ahtiana aurescens*) is ranked by AC CDC as S2S3 (imperiled/vulnerable) in Nova Scotia;
- **Powdered Fringe Lichen** (*Heterodermia speciosa*) is ranked by AC CDC as S3S4; (vulnerable/apparently secure) in Nova Scotia; and,
- **Shaggy Fringed Lichen** (*Anaptychia palmulata*) is ranked by AC CDC as S3S4 (vulnerable/apparently secure) in Nova Scotia.

Vascular plant SoCC observed in 2022 include:

- **Meadow Horsetail** (*Equisetum pratense*) is ranked by AC CDC as S3S4 (vulnerable/apparently secure) in Nova Scotia. This plant was observed commonly in swamps and wet meadows throughout the LAA; and,
- **American beech** (*Fagus grandifolia*) is ranked by the AC CDC as S3S4 (vulnerable/apparently secure) in Nova Scotia and was found to be common through hardwood dominated forests of the LAA.

#### 5.4

### Assessment of Culturally Significant Vegetation

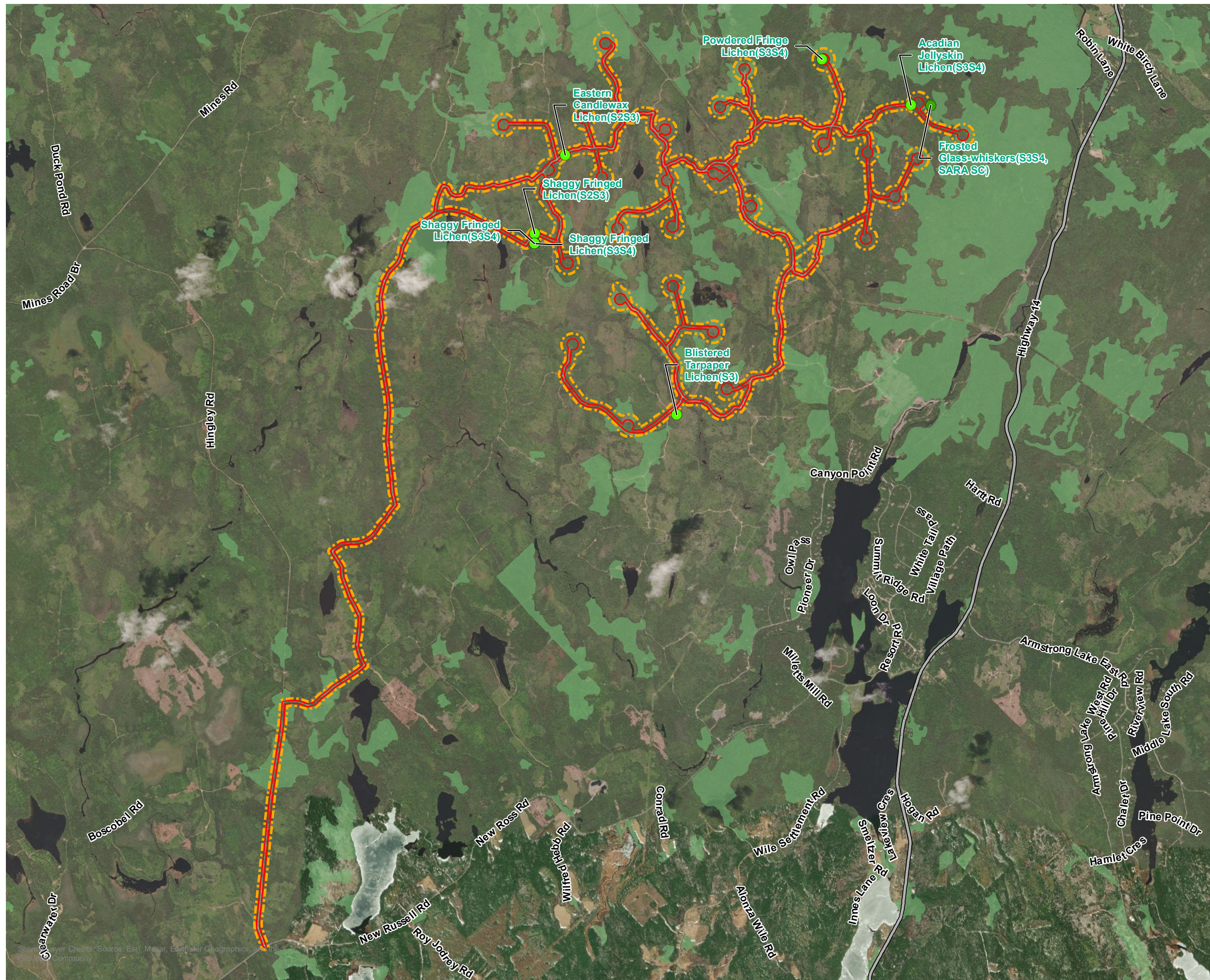
Some of the plants found within the terrestrial LAA are recognized to be traditional Mi'kmaw medicinal plants or culturally-significant plants. A list of culturally important vegetation for the Mi'kmaq that had the potential to be located in the Project area was prepared by a terrestrial biologist from Maqamigew Anqotumeg. The list was established following desktop analysis of the site and overview of the habitat types located within the Project area. The plants identified during the 2021 and 2022 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 C. A list of the flora considered to be of cultural significance to the Mi'kmaq that were identified across the Project site is presented below in Table 6.

BENJAMINS MILL WIND PROJECT

**VEGETATION AND LICHEN SPECIES AT RISK AND SPECIES OF CONSERVATION CONCERN**

FIGURE 4

- Potential Development Area (PDA)
  - Local Assessment Area
  - Highway
- Plant Observations**
- Species at Risk
  - Species of Conservation Concern
  - American Beech (*Fagus grandifolia*)  
(common in hardwood forests)



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

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



PROJECT: 21-1329  
STATUS: DRAFT  
DATE: 2022-12-14



**Table 6: Culturally Significant Flora to the Mi'kmaq Observed**

Common Name	Scientific Name	Mi'kmaq Name	Habitats Observed within the LAA
Striped maple	<i>Acer pensylvanicum</i>	Wapoq	Hardwood-dominant forest/mixedwood forest
Sugar maple	<i>Acer saccharum</i>	Snaweyey	Hardwood-dominant forest/mixedwood forest
Common yarrow	<i>Achillea millefolium</i>	N/A	Disturbed areas
Pearly everlasting	<i>Anaphalis margaritacea</i>	Wapwasuek	Disturbed areas
Wild sarsaparilla	<i>Aralia nudicaulis</i>	Wopapa'kjukal	Hardwood-dominant forest/softwood-dominant forest/mixedwood forest/wetlands
Yellow birch	<i>Betula alleghaniensis</i>	Nimnoqn	Hardwood-dominant forest/mixedwood forest/disturbed areas
Sweet-fern	<i>Comptonia peregrina</i>	N/A	Disturbed areas
Goldthread	<i>Coptis trifolia</i>	Wisawkweskl	Mixedwood forest/wetlands
Beaked hazelnut	<i>Corylus cornuta</i>	Mlipkanjmusi	Mixedwood forests
American beech	<i>Fagus grandifolia</i>	Suomusi	Hardwood-dominant forest/mixedwood forests/wetlands
Wild strawberry	<i>Fragaria virginiana</i>	Atuomkomiqaqi	Disturbed areas
Creeping snowberry	<i>Gaultheria hispidula</i>	Kna'ji'j	Softwood-dominant forest/mixedwood forest/disturbed areas/wetlands
Harlequin blue flag	<i>Iris versicolor</i>	N/A	Disturbed areas
Sheep laurel	<i>Kalmia angustifolia</i>	N/A	Softwood-dominant forest/mixedwood forest/disturbed areas/wetlands
Inflated lobelia	<i>Lobelia inflata</i>	Tmawey	Disturbed areas
Partridgeberry	<i>Mitchella repens</i>	Ka'qaujumnaqi	Hardwood-dominant forest/mixedwood forest/wetlands
Red spruce	<i>Picea rubens</i>	Mekwe'k kawatkw	Hardwood-dominant forest/mixedwood forest/disturbed areas

Common Name	Scientific Name	Mi'kmaq Name	Habitats Observed within the LAA
Eastern white pine	<i>Pinus strobus</i>	Kuow	Hardwood-dominant forest/mixedwood forest/disturbed areas/wetlands
Common plantain	<i>Plantago major</i>	Wijikanipkl	Disturbed areas
Pin cherry	<i>Prunus pensylvanica</i>	Maskwe'simanaqsi	Hardwood-dominant forest/softwood-dominant forest/disturbed areas
Choke cherry	<i>Prunus virginiana</i>	Elwimanaqsi	Wetlands/Forests
Skunk currant	<i>Ribes glandulosum</i>	N/A	Wetlands/Forests
Alleghaney blackberry	<i>Rubus allegheniensis</i>	Ajioqqimanaqsi (blackberry)	Wetlands/disturbed areas (clear cut/previously cut-over habitats)
Red raspberry	<i>Rubus idaeus</i>	Klitaw	Hardwood-dominant forest/disturbed areas/wetlands
Dwarf red raspberry	<i>Rubus pubescens</i>	Katomin	Hardwood-dominant forest
Red elderberry	<i>Sambucus racemosa</i>	Pukulu'skwimanaqsi (elderberry)	Hardwood-dominant forest
American mountain ash	<i>Sorbus americana</i>	Epsimusi	Softwood-dominant forest/mixedwood forest/disturbed areas
Late lowbush blueberry	<i>Vaccinium angustifolium</i>	Pkwiman (blueberry)	Softwood-dominant forest
Velvet-leaved blueberry	<i>Vaccinium myrtilloides</i>	Pkwiman (blueberry)	Softwood-dominant forest/mixedwood forest/disturbed areas/wetlands
Northern wild raisin	<i>Viburnum cassinoides</i>	Skinaqanmusi	Mixedwood forest/disturbed areas/wetlands

## 5.5

## Assessment Conclusions

Based on the results of the desktop review and confirmed through a two-year field assessment of terrestrial habitats and vegetation, the habitat types identified in the LAA for the vegetation and lichens include:

- Hardwood-dominated forest;
- Mixedwood dominated forest;
- Softwood-dominated forests;
- Clear cut or previously cut-over areas;
- Bogs and fens; and,
- Swamps and marshes.

Two SoCC vascular plants, one SAR lichen and five SoCC lichen (were identified during biological field surveys over 2021 and 2022. Lichen SoCC observed include: Frosted Glass-whiskers Lichen (*Sclerophora peronella*; listed as S3S4 and Special Concern under SARA and COSEWIC), Shaggy Fringed Lichen (*Anaptychia palmulata*; listed as S3S4), Blistered Tarpaper Lichen (*Collema nigrescens*; listed as S3 in Nova Scotia by the AC CDC), Acadian Jellyskin Lichen (*Leptogium acadense*; listed as S3S4), Powdered Fringe Lichen (*Heterodermia speciose*; listed as S3S4), and Eastern Candlewax Lichen (*Ahtiana aurescens*; listed as S2S3). Vascular plant SoCC include: meadow horsetail (*Equisetum pretense*, listed as S3S4) and American beech (*Fagus grandifolia*; listed as S3S4), which was identified in hardwood-dominant forest, mixedwood forests and swamps and marshes habitat types in the LAA (Figure 4).

The Project has been sited to minimize the potential impact of the Project on natural landscapes and undisturbed natural habitat by selecting lands previously impacted by anthropogenic activities. In this case, approximately 34% of the PDA is sited on lands previously or presently used for forestry activities, agricultural operations, and access roads and trails. The Project aims to benefit the area by providing an environmentally friendly and productive source of renewable energy for Nova Scotia, while limiting potential impacts to the natural environment.

## 6.0 Effects Assessment and Mitigation Recommendations

### 6.1 Identification of Project Environmental Effects

Vegetation and lichens were selected as a VEC because of their relationship with species at risk, migratory birds, bats and other biological and physical components addressed as VECs in this EA. Protecting vegetation and plant biodiversity is an important and integral aspect of maintaining a diverse ecosystem.

#### 6.1.1 Approach to Project Components

The Project has three main distinct phases during each of which the potential interactions with the surrounding environment are considered distinct. Unplanned events are considered separately from the phases.

The phases of the Project include:

1. Planning, Site Preparation and Construction Phase;
2. Operation Phase; and,
3. Decommissioning Phase.

The project interaction matrix in Table 7 is used as an initial screening to assist in determining if it possible for interactions to occur between the activities being carried out in each phase of the Project and vegetation or lichens.

**Table 7: Project Interactions with Environmental Components**

Valued Environmental Component	Project Phases			
	Planning, Site Preparation and Construction Phase	Operation Phase	Decommissioning Phase	Unplanned Events
Vegetation and Lichens	✓	✓	✓	✓

Legend: ✓ = Potential interaction identified

Those project phases for which a checkmark is provided indicates that the Project may interact with vegetation or lichens, and thus an environmental effects assessment is warranted. Interactions may occur during the phases of planning, site preparation, construction, operations, and decommissioning as well as due to unplanned events, which are all discussed below.

### 6.1.2 Identification of Potential Environmental Effects

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

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

### 6.1.3 Standard Mitigation of Potential Environmental Effects

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

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

- *Canadian Environmental Protection Act* and regulations (ECCC 1999);
- *Species at Risk Act* (ECCC 2002);
- *Transportation of Dangerous Goods Act*, and regulations (TC 1992);
- *Nova Scotia Environment Act* and regulations (NSG 1994-95);
- *Nova Scotia Endangered Species Act*, and regulations (NSG 1998a);
- *Nova Scotia Wilderness Areas Protection Act*, and regulations (NSG 1998b); and,
- Contingency Planning Guidelines (NSG 2021).

To further reduce the likelihood of interactions between any phase of the Project to vegetation or lichens, the proposed mitigation measures summarized in Table 8 will be implemented.

**Table 8: Potential Interactions and Proposed Mitigation for Vegetation**

Potential Interactions with Vegetation	Proposed Mitigation Measures
<p>The potential for direct loss of vegetation through Project activities including vegetation clearing and grubbing activities during the construction, operational phase, as well as during the eventual Project decommissioning and site reclamation activities.</p>	<ol style="list-style-type: none"> <li>1. Proper vegetation management measures following an Environmental Management and Protection Plan will be instated;</li> <li>2. Through the site selection process, the Project footprint has been sited predominantly in areas previously disturbed via clear cutting through forestry activities, creating a highly fragmented habitat and the project footprint is limited, to the extent possible, in areas of undisturbed habitat;</li> <li>3. The area to be disturbed by the Project will be minimized to the extent possible (i.e., limited to the area that is required to accomplish the Project objectives only);</li> <li>4. Following the construction and decommissioning phases of the Project, natural revegetation with native species will be promoted in consultation with the landowner;</li> <li>5. The access roads have been optimized to make use of existing roads at the Project site to reduce the amount of flora to be cleared; and,</li> <li>6. Vegetation control measures during the operational phase will be minimized to the extent possible.</li> </ol>
<p>The potential for indirect loss of riparian or wetland vegetation communities may result from introduction of sediment from Project activities around waterways and wetlands.</p>	<ol style="list-style-type: none"> <li>1. Vehicle cleaning will occur away from any watercourse/wetland. Cleaning will also occur as vehicles leave the site to ensure that invasive species already present are not spread to other areas; and,</li> <li>2. Any revegetation of a reclaimed site must be either naturally occurring or using native local vegetation in consultation with the landowner.</li> </ol>
<p>The potential introduction or spread of invasive species on and off site through plant matter attached to construction equipment.</p>	<ol style="list-style-type: none"> <li>1. Heavy equipment will be properly cleaned and visually inspected prior to mobilizing to and from site to avoid potential introduction of exotic and invasive species.</li> <li>2. Vehicle cleaning will occur away from any watercourse/wetland. Cleaning will also occur as vehicles leave the site to ensure that invasive species already present are not spread to other areas.</li> </ol>

Potential Interactions with Vegetation	Proposed Mitigation Measures
	<p><u>Mitigation Measures for Unplanned Events</u></p> <ol style="list-style-type: none"> <li>1. Equipment will be kept in good working order and regularly maintained to reduce risk of spills/leaks and to avoid water contamination;</li> <li>2. Spill response kits will be readily available for each piece of equipment, on-site workers are required be knowledgeable on emergency spill response protocols and initiate corrective measures immediately to minimise any impacts to the surrounding environment;</li> <li>3. Where applicable, secondary containment and limited quantities of chemicals and fuels required to be stored on site shall be in an area away from the surrounding terrestrial environment, or direct pathways (i.e., ditches) to the surrounding environment, all chemicals and fuels will be stored in appropriate containers designed for the reduction of potential spills or leaks;</li> <li>4. Refueling, oiling, and maintenance of equipment will be completed in specifically designated areas located at least 30 m away from any watercourse, wetland, or well to minimize potential effects that could arise in the event of a spill;</li> <li>5. If contaminated soil is encountered, it will be reported to NSE and managed utilizing the Nova Scotia Contaminated Site Regulations;</li> <li>6. Work entailing use of toxic or hazardous materials, chemicals, or otherwise creating hazard to life, safety of health, will be conducted in accordance with National Fire Code of Canada to minimize the potential for spills or fires;</li> </ol>
<p>The potential loss or disturbance to SAR/SoCC plants and lichens during construction and decommissioning phases of the Project or from required maintenance during the operational phase.</p>	<ol style="list-style-type: none"> <li>1. Frosted Glass-whiskers is listed as Special Concern through SARA; A 100 m buffer will be set around Frosted Glass-whiskers and the road layout will be adjusted to avoid this buffer area</li> <li>2. The locations of the SAR and SoCC plants will be avoided by adjusting utility pole alignment to buffer these species, where feasible, or spanning their</li> </ol>

Potential Interactions with Vegetation	Proposed Mitigation Measures
	<p>locations by utility poles and refraining from clearing vegetation in their vicinity;</p> <ol style="list-style-type: none"> <li>3. Vegetation control measures during the operational phase will be minimized to the extent possible and Glyphosate will not be used in vegetation management for the Project;</li> <li>4. Those that are performing onsite activities will be familiarized with the SAR/SoCC identified by the field studies prior to any site activities taking place;</li> <li>5. No work to be completed in waterways;</li> <li>6. Project activities will maintain a 50m riparian (streamside) buffer of any waterways where SAR species have been observed;</li> <li>7. Specimens will be marked with flagging tape and GPS location will be provided to onsite workers to ensure they avoid work in the setback area;</li> <li>8. Efforts will be made to maintain mature vegetation along the edges of the development area, particularly in riparian areas; and</li> <li>9. During Project activities, should a new SAR/SoCC be identified, a buffer will be maintained and additional mitigation will be developed in consultation with NSDNRR.</li> </ol>

**6.2 Residual Environmental Effects**

The Project will be developed in such a way as to minimize the area of disturbance within the Project site and natural revegetation of the site will be promoted at the earliest opportunity. The majority (approximately 34%) of the PDA has been already disturbed due to previous site activities, including several generations of forestry activities, which are unrelated to the Project. The final Project layout will consider appropriate buffers for any identified SAR/SoCC. Project siting has minimized the flora footprint from the access roads, crane pads, turbine foundation, and substation by making use of existing infrastructure and disturbed areas. Land cleared for construction that is not needed for the operational phase of the Project will be restored to the extent possible and is anticipated to naturally regenerate.

Given current knowledge as informed by the desktop assessment, biophysical assessments, and previous site activities, significant potential impacts to vegetation communities are not anticipated as a direct result of the Project with the appropriate implementation of the mitigation measures presented. Any revisions to the Project footprint will consider the locations of the SAR and SoCC plants and avoid





them to the extent possible by adjusting utility pole alignment to buffer these species, where feasible, or spanning their locations by utility poles and refraining from clearing vegetation in their vicinity. Additionally, following the construction and decommissioning phases of the Project, natural revegetation with native species will be promoted in consultation with the landowner to minimize the potential for habitat loss and invasive species spread.

With the proposed mitigation measures employed, the significance of residual effects on flora is predicted to be minor; however, post-construction monitoring and adaptive management plans should include monitoring the effects on the SAR lichen, Frosted Glass-whiskers (*Sclerophora peronella*) identified at the site. Other monitoring or biophysical assessments are not recommended.

### 6.3 Cumulative Environmental Effects

Cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions (GOC 2022b). Specific to the nature of the undertaking, cumulative effects are combined impacts that may occur when wind power projects or other types of projects are located in the same region (NSECC 2021). Nearby wind energy projects to the proposed project include the South Canoe Lake Wind Energy Project, the Martock Ridge Wind Project and the Ellershouse Wind Project. The distance between the Project to the nearest existing wind farm is approximately, i.e., 8 km. The potential for interaction between the residual effects of the projects to vegetation and lichens is considered to be unlikely.

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

- Public roads and forestry access roads for historical and ongoing forestry activities located within the LAA; and,
- Recreational trails for motorized vehicles (heavy equipment, passenger vehicles, and recreational vehicles including All Terrain Vehicles and snowmobiles) located throughout the LAA.

As discussed above, the Project will be located predominantly on privately owned lands used for forestry and recreation (i.e. snowmobile trails). The forestry activities include previously forested land at varying stages of regeneration, as well as undeveloped forested lands owned by forestry companies. Without mitigation measures, cumulative effects to vegetation and lichens could occur as a result of:

- Spreading invasive species to new habitats;
- Contributing sediment to wetlands and riparian communities by erosion from dirt roads and vegetation clearing; and,
- Removing protective buffers from sensitive vegetation and lichen species by further fragmenting the landscape by the clearing of additional corridors.

Without the above mitigation measures, cumulative impacts to vegetation and lichens could occur during the operational phase of the Project from the increased number of vehicles and use of site access roads in addition to the existing site uses. In order to further mitigate risk to vegetation and lichen during the Project phases, there will be a concerted effort to use existing corridors found on site, limit over story removal, and manage vegetation. The anticipated cumulative effects on vegetation are anticipated to be very low. Furthermore, the broader threat of climate change will have many negative impacts to plant and lichen species. Although the Project may not necessarily have measurable climate effects with local impacts on vegetation, the societal transition to renewable energy is a positive action which may support long term population growth through a reduction in climate change.

## 7.0

## Summary and Conclusions

The Benjamins Mill Wind Project is located in Hants County, approximately 10 km southwest of Windsor (Figure 1). The Project is proposed to have an installed capacity of up to 150 MW, amounting to up to 28 wind turbine generators (WTGs) and associated infrastructure, including a substation and overhead transmission line.

The Atlantic population of Frosted Glass-whiskers (*Sclerophora peronella*) was observed in 2021. This lichen is listed as Special Concern under SARA and COSEWIC and ranked by AC CDC as S3S4 (vulnerable/apparently secure) in Nova Scotia. Additionally, two SoCC vascular plant and five SoCC lichen were identified during biological field surveys over 2021 and 2022 (Figure 4).

The Project has been sited to minimize its potential impact on natural landscapes and undisturbed natural habitat by selecting lands previously impacted by anthropogenic activities. The Project aims to benefit the area by providing an environmentally friendly and productive source of renewable energy for Nova Scotia, while limiting potential impacts to the natural environment.

In order to further mitigate risk to vegetation habitats and species, the Project footprint has been sited predominantly in areas previously disturbed via clear cutting through forestry activities, creating a highly fragmented habitat and the project footprint is limited, to the extent possible, in areas of undisturbed habitat. Furthermore, the broader threat of climate change will have many negative impacts to plant and lichen species. Although the project won't necessarily have measurable climate effects with local impacts on vegetation, the societal transition to renewable energy is a positive action which may support long term population growth through a reduction in climate change.

## 8.0

## Closure

This report was prepared by Dillon Consulting Limited (Dillon) for Natural Forces Developments Limited Partnership (the Proponent) on behalf of the Westchester Wind Limited Partnership, in support of the Westchester Wind Project Addendum (2022). Dillon has used the degree of care and skill ordinarily exercised under similar circumstances at the time the work was performed by reputable members of the environmental consulting profession practicing in Canada. Dillon assumes no responsibility for conditions which were beyond its scope of work. There is no warranty expressed or implied by Dillon.

The material in the report reflects Dillon's best judgment in light of the information available to Dillon at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

## 9.0

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# Appendix A

## *Master Plant and Lichen Lists*

**Table A1: Vascular Plant Master List for 2021 and 2022**

Common Name	Scientific Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)	Culturally Significant*	Hardwood-Dominant Forest	Softwood-Dominant Forest	Mixedwood Forest	Cut/ Disturbed	Bogs and Fens	Swamps and Marshes
Balsam Fir	<i>Abies balsamea</i>	S5		X	X	X	X		X
Striped Maple	<i>Acer pensylvanicum</i>	S5	X	X		X			
Red Maple	<i>Acer rubrum</i>	S5		X	X	X	X	X	X
Sugar Maple	<i>Acer saccharum</i>	S4S5	X	X		X			
Mountain Maple	<i>Acer spicatum</i>	S5		X		X			
Common Yarrow	<i>Achillea millefolium</i>	SNA	X				X		
Red Baneberry	<i>Actaea rubra</i>	S5							
Nova Scotia Agalinis	<i>Agalinis neoscotica</i>	S4S5							
Colonial Bentgrass	<i>Agrostis capillaris</i>	SNA							
Rough Bent Grass	<i>Agrostis scabra</i>	S5					X		
Speckled Alder	<i>Alnus incana</i>	S5					X		X
Smooth Serviceberry	<i>Amelanchier laevis</i>	S5			X	X			X
Pearly Everlasting	<i>Anaphalis margaritacea</i>	S5	X				X		
Bristly Sarsaparilla	<i>Aralia hispida</i>	S5					X		
Wild Sarsaparilla	<i>Aralia nudicaulis</i>	S5	X	X	X	X			X
Red Chokeberry	<i>Aronia arbutifolia</i>	S4			X				
Black Chokeberry	<i>Aronia melanocarpa</i>	S5						X	X
Branched Bartonian	<i>Bartonia paniculata</i>	S4S5						X	
Yellow Birch	<i>Betula alleghaniensis</i>	S5	X	X		X	X		
Paper Birch	<i>Betula papyrifera</i>	S5		X	X	X	X	X	
Gray Birch	<i>Betula populifolia</i>	S5				X	X		
Northern Shorthusk	<i>Brachyelytrum aristosum</i>	S5				X			
Bearded Shorthusk	<i>Brachyelytrum erectum</i>	SNA							
Bluejoint Reed Grass	<i>Calamagrostis canadensis</i>	S5							
Pickering's Reed Grass	<i>Calamagrostis pickeringii</i>	S5							X
Wild Calla	<i>Calla palustris</i>	S4							
Tuberous Grass Pink	<i>Calopogon tuberosus</i>	S4S5						X	
Pink Corydalis	<i>Capnoides sempervirens</i>	S4							
Black Sedge	<i>Carex arctata</i>	S5		X					
Atlantic Sedge	<i>Carex atlantica</i>	S4S5						X	X
Fibrous-Root Sedge	<i>Carex communis</i>	S5					X		
Fringed Sedge	<i>Carex crinita</i>	S5				X	X		
Two-seeded Sedge	<i>Carex disperma</i>	S5							



Common Name	Scientific Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)	Culturally Significant*	Hardwood-Dominant Forest	Softwood-Dominant Forest	Mixedwood Forest	Cut/ Disturbed	Bogs and Fens	Swamps and Marshes
Star Sedge	Carex echinata	S5						X	X
Nodding Sedge	Carex gynandra	S5							X
Finely-Nerved Sedge	Carex leptoneura	S5		X					
Sallow Sedge	Carex lurida	S5					X		
Boreal Bog Sedge	Carex magellanica	S5						X	X
New England Sedge	Carex novae-angliae	S5		X		X			
Necklace Sedge	Carex projecta	S5					X		
Broom Sedge	Carex scoparia	S5					X		
Tussock Sedge	Carex stricta	S5							X
Three-seeded Sedge	Carex trisperma	S5				X			X
Black Knapweed	Centaurea nigra	SNA					X		
Leatherleaf	Chamaedaphne calyculata	S5					X	X	
Fireweed	Chamaenerion angustifolium	S5					X		
Bull Thistle	Cirsium vulgare	SNA					X		
Interrupted Fern	Claytonia virginica	S5				X			
Yellow Bluebead Lily	Clintonia borealis	S5		X		X			X
Sweet-fern	Comptonia peregrina	S5	X				X		
Goldthread	Coptis trifolia	S5	X			X			X
Bunchberry	Cornus canadensis	S5		X		X	X		X
Beaked Hazel	Corylus cornuta	S5	X			X			
Pink Lady's-Slipper	Cypripedium acaule	S5		X	X	X			
Lady Slipper sp.	Cypripedium sp.	N/A							
Poverty Oat Grass	Danthonia spicata	S5				X	X		
Queen Anne's Lace	Daucus carota	SNA					X		
Round-branched Tree-clubmoss	Dendrolycopodium dendroideum	S5				X			
Flat-branched Tree-clubmoss	Dendrolycopodium obscurum	S4				X			
Eastern Hay-Scented Fern	Dennstaedtia punctilobula	S5		X		X			X
Northern Panic Grass	Dichanthelium boreale	S5			X		X		
Northern Bush Honeysuckle	Diervilla lonicera	S5		X		X	X		
Southern Ground-cedar	Diphysastrum digitatum	S5				X			
Hairy Flat-top White Aster	Doellingeria umbellata	S5			X		X	X	
Round-leaved Sundew	Drosera rotundifolia	S5							X
Spinulose Wood Fern	Dryopteris carthusiana	S5							
Crested Wood Fern	Dryopteris cristata	S5							X

Common Name	Scientific Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)	Culturally Significant*	Hardwood-Dominant Forest	Softwood-Dominant Forest	Mixedwood Forest	Cut/ Disturbed	Bogs and Fens	Swamps and Marshes
Evergreen Wood Fern	<i>Dryopteris intermedia</i>	S5			X	X			X
Marginal Wood Fern	<i>Dryopteris marginalis</i>	S5				X			
Three-Way Sedge	<i>Dulichium arundinaceum</i>	S5						X	
Blunt Spikerush	<i>Eleocharis obtusa</i>	S5					X		
Trailing Arbutus	<i>Epigaea repens</i>	S5				X	X		
Northern Willowherb	<i>Epilobium ciliatum</i>	S5							
Marsh Willowherb	<i>Epilobium palustre</i>	S5					X		
Helleborine	<i>Epipactis helleborine</i>	SNA							
Field Horsetail	<i>Equisetum arvense</i>	S5					X		
Water Horsetail	<i>Equisetum fluviatile</i>	S5							X
Meadow Horsetail	<i>Equisetum pratense</i>	S3S4							
Woodland Horsetail	<i>Equisetum sylvaticum</i>	S5							
Eastern Burnweed	<i>Erechtites hieraciifolius</i>	S5							
Annual Fleabane	<i>Erigeron annuus</i>	S4S5					X		
Canada Horseweed	<i>Erigeron canadensis</i>	S5							
Rough Fleabane	<i>Erigeron strigosus</i>	S5					X		
Narrow-leaved Cottongrass	<i>Eriophorum angustifolium</i>	S5						X	
Tawny Cottongrass	<i>Eriophorum virginicum</i>	S5						X	X
Common Boneset	<i>Eupatorium perfoliatum</i>	S5							X
Common Eyebright	<i>Euphrasia nemorosa</i>	SNA					X		
Eyebright	<i>Euphrasia sp.</i>	N/A							
Grass-leaved Goldenrod	<i>Euthamia graminifolia</i>	S5					X		
Spotted Joe Pye Weed	<i>Eutrochium maculatum</i>	S5					X		X
American Beech	<i>Fagus grandifolia</i>	S3S4	X	X		X			X
Fringed Black Bindweed	<i>Fallopia cilioides</i>	S5							
Eurasian Black Bindweed	<i>Fallopia convolvulus</i>	SNA		X			X		
Wild Strawberry	<i>Fragaria virginiana</i>	S5	X				X		
Glossy Buckthorn	<i>Frangula alnus</i>	SNA					X		
White Ash	<i>Fraxinus americana</i>	S4		X					
Common Marsh Bedstraw	<i>Galium palustre</i>	S5							
Three-flowered Bedstraw	<i>Galium triflorum</i>	S5							
Creeping Snowberry	<i>Gaultheria hispidula</i>	S5	X		X	X	X	X	X
Eastern Teaberry	<i>Gaultheria procumbens</i>	S5				X	X		
Black Huckleberry	<i>Gaylussacia baccata</i>	S5			X	X	X		

Common Name	Scientific Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)	Culturally Significant*	Hardwood-Dominant Forest	Softwood-Dominant Forest	Mixedwood Forest	Cut/ Disturbed	Bogs and Fens	Swamps and Marshes
Dwarf Huckleberry	Gaylussacia bigeloviana	S5							
Northern Manna Grass	Glyceria borealis	S5							X
Canada Manna Grass	Glyceria canadensis	S5						X	
Fowl Manna Grass	Glyceria striata	S5						X	X
Marsh Cudweed	Gnaphalium uliginosum	SNA					X		
Checkered Rattlesnake-Plantain	Goodyera tessellata	S4							
Common Oak Fern	Gymnocarpium dryopteris	S5				X			
American Witch-Hazel	Hamamelis virginiana	S5				X	X		X
Rough Hawkweed	Hieracium scabrum	S5							
Azure Bluet	Houstonia caerulea	S5							
Northern St John's-Wort	Hypericum boreale	S5					X		
Canada St John's-wort	Hypericum canadense	S5					X		
Fraser's St. John's-wort	Hypericum fraseri	S5							
False St John's-wort	Hypericum gentianoides	SNA					X		
Common St. John's-wort	Hypericum perforatum	SNA					X		
Virginia St. John's-wort	Hypericum virginicum	S5						X	
Mountain Holly	Ilex mucronata	S5			X	X		X	X
Common Winterberry	Ilex verticillata	S5					X		X
Spotted Jewelweed	Impatiens capensis	S5							
Harlequin Blue Flag	Iris versicolor	S5	X				X		
Tansy Ragwort	Jacobaea vulgaris	SNA					X		
Narrow-Panicled Rush	Juncus brevicaudatus	S5					X		
Canada Rush	Juncus canadensis	S5					X		
Soft Rush	Juncus effusus	S5					X		
Brown-Fruited Rush	Juncus pelocarpus	S5					X		
Slender Rush	Juncus tenuis	S5					X		
Common Juniper	Juniperus communis	S5			X	X			
Sheep Laurel	Kalmia angustifolia	S5	X		X	X	X	X	X
Tall Blue Lettuce	Lactuca biennis	S5					X		
Canada Lettuce	Lactuca canadensis	S5							
Rice Cut Grass	Leersia oryzoides	S5							
Oxeye Daisy	Leucanthemum vulgare	SNA					X		
Twinflower	Linnaea borealis	S5			X	X			X
Inflated Lobelia	Lobelia inflata	S5	X						

Common Name	Scientific Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)	Culturally Significant*	Hardwood-Dominant Forest	Softwood-Dominant Forest	Mixedwood Forest	Cut/ Disturbed	Bogs and Fens	Swamps and Marshes
Canada Fly Honeysuckle	<i>Lonicera canadensis</i>	S5		X		X	X		
Garden Bird's-foot Trefoil	<i>Lotus corniculatus</i>	SNA					X		
Running Clubmoss	<i>Lycopodium clavatum</i>	S5					X		
American Water Horehound	<i>Lycopus americanus</i>	S5							X
Northern Water Horehound	<i>Lycopus uniflorus</i>	S5							
Northern Starflower	<i>Lysimachia borealis</i>	S5		X	X				X
Swamp Yellow Loosestrife	<i>Lysimachia terrestris</i>	S5							X
Purple Loosestrife	<i>Lythrum salicaria</i>	SNA							
Wild Lily-of-The-Valley	<i>Maianthemum canadense</i>	S5		X		X	X		X
Large False Solomon's Seal	<i>Maianthemum racemosum</i>	S4S5		X		X			
Three-leaved False Solomon's Seal	<i>Maianthemum trifolium</i>	S5						X	X
Pineapple Weed	<i>Matricaria discoidea</i>	SNA					X		
Cucumber Root	<i>Medeola virginiana</i>	S5		X		X			X
American Cow Wheat	<i>Melampyrum lineare</i>	S5			X	X			
White Sweet-clover	<i>Melilotus albus</i>	SNA					X		
Partridgeberry	<i>Mitchella repens</i>	S5	X	X		X			X
Convulsion-Root	<i>Monotropa uniflora</i>	S5		X	X	X			X
Sweet Gale	<i>Myrica gale</i>	S5						X	
Tall Rattlesnakeroot	<i>Nabalus altissimus</i>	S5				X	X		
Rattlesnakeroot sp.	<i>Nabalus sp.</i>	N/A							
Three-leaved Rattlesnakeroot	<i>Nabalus trifoliolatus</i>	S5				X	X		
Whorled Wood Aster	<i>Oclemena acuminata</i>	S5			X	X	X		X
Bog Aster	<i>Oclemena nemoralis</i>	S5						X	X
Sensitive Fern	<i>Onoclea sensibilis</i>	S5					X		X
One-sided Wintergreen	<i>Orthilia secunda</i>	S5							X
Royal Fern	<i>Osmunda regalis</i>	S5						X	X
Cinnamon Fern	<i>Osmundastrum cinnamomeum</i>	S5				X	X	X	X
Common Wood Sorrel	<i>Oxalis montana</i>	S5				X			
European Wood Sorrel	<i>Oxalis stricta</i>	S5							
Schweinitz's Groundsel	<i>Packera schweinitziana</i>	S4					X		
New York Fern	<i>Parathelypteris noveboracensis</i>	S5		X					X
Spotted Lady's-thumb	<i>Persicaria maculosa</i>	SNA					X		
Stout Smartweed	<i>Persicaria robustior</i>	S4							X
Arrow-leaved Smartweed	<i>Persicaria sagittata</i>	S5					X		

Common Name	Scientific Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)	Culturally Significant*	Hardwood-Dominant Forest	Softwood-Dominant Forest	Mixedwood Forest	Cut/ Disturbed	Bogs and Fens	Swamps and Marshes
Northern Sweet Coltsfoot	<i>Petasites frigidus</i>	S4							X
Northern Beech Fern	<i>Phegopteris connectilis</i>	S5		X		X			
White Spruce	<i>Picea glauca</i>	S5		X		X	X		
Black Spruce	<i>Picea mariana</i>	S5			X	X		X	X
Red Spruce	<i>Picea rubens</i>	S5	X	X		X	X		
Meadow Hawkweed	<i>Pilosella caespitosa</i>	SNA							
Mouse-ear Hawkweed	<i>Pilosella officinarum</i>	SNA					X		
Tall Hawkweed	<i>Pilosella piloselloides</i>	SNA					X		
Eastern White Pine	<i>Pinus strobus</i>	S5	X	X		X	X		X
Common Plantain	<i>Plantago major</i>	SNA	X				X		
Club Spur Orchid	<i>Platanthera clavellata</i>	S5					X		
Ragged Fringed Orchid	<i>Platanthera lacera</i>	S4S5							X
Rose Pogonia	<i>Pogonia ophioglossoides</i>	S4S5							
Knotweed ssp.	<i>Polygonum spp.</i>	N/A							
Rock Polypody	<i>Polypodium virginianum</i>	S5		X		X			
White Poplar	<i>Populus alba</i>	SNA					X		
Large-toothed Aspen	<i>Populus grandidentata</i>	S5				X			
Trembling Aspen	<i>Populus tremuloides</i>	S5				X	X		
Rough Cinquefoil	<i>Potentilla norvegica</i>	S5					X		
Old Field Cinquefoil	<i>Potentilla simplex</i>	S5					X		
Pin Cherry	<i>Prunus pensylvanica</i>	S5	X	X	X		X		
Black Cherry	<i>Prunus serotina</i>	S5				X			
Chokecherry	<i>Prunus virginiana</i>	S5	X						
Bracken Fern	<i>Pteridium aquilinum</i>	S5			X	X	X		
Shinleaf	<i>Pyrola elliptica</i>	S5		X					
Northern Red Oak	<i>Quercus rubra</i>	S5				X	X		
Tiny Allseed	<i>Radiola linoides</i>	SNA					X		
Rhodora	<i>Rhododendron canadense</i>	S5			X	X		X	
Common Labrador Tea	<i>Rhododendron groenlandicum</i>	S5					X	X	
White Beakrush	<i>Rhynchospora alba</i>	S5						X	
Brown Beakrush	<i>Rhynchospora fusca</i>	S4					X		
Skunk currant	<i>Ribes glandulosum</i>	S5	X						
Multiflora Rose	<i>Rosa multiflora</i>	SNA					X		
Shining Rose	<i>Rosa nitida</i>	S4S5							X

Common Name	Scientific Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)	Culturally Significant*	Hardwood-Dominant Forest	Softwood-Dominant Forest	Mixedwood Forest	Cut/ Disturbed	Bogs and Fens	Swamps and Marshes
Alleghaney Blackberry	Rubus allegheniensis	S5	X				X		
Bristly Dewberry	Rubus hispida	S5					X	X	X
Red Raspberry	Rubus idaeus	S5	X	X			X		X
Dwarf Red Raspberry	Rubus pubescens	S5	X	X					
Dewdrop	Rubus repens	S4S5				X			X
Black-Eyed Susan	Rudbeckia hirta	SNA					X		
Bebb's Willow	Salix bebbiana	S5					X		
Pussy Willow	Salix discolor	S5					X		
Cottony Willow	Salix eriocephala	S5							
Willow spp.	Salix spp.	N/A							
Red Elderberry	Sambucus racemosa	S5	X	X					
Northern Pitcher Plant	Sarracenia purpurea	S5						X	X
Common Woolly Bulrush	Scirpus cyperinus	S5					X		
Autumn Hawkbit	Scorzoneroides autumnalis	SNA					X		
mad dog skullcap	Scutellaria lateriflora	S5							
Woodland Ragwort	Senecio sylvaticus	SNA							
Mountain Blue-eyed-grass	Sisyrinchium montanum	S5					X		
White Goldenrod	Solidago bicolor	S5					X		
Canada Goldenrod	Solidago canadensis	S4S5					X		
Downy Goldenrod	Solidago puberula	S5					X		
Rough-stemmed Goldenrod	Solidago rugosa	S5					X		X
American Mountain Ash	Sorbus americana	S5	X		X	X	X		
American Burreed	Sparganium americanum	S5							X
Narrow-leaved Burreed	Sparganium angustifolium	S5							X
Green-fruited Burreed	Sparganium emersum	S5						X	
Stiff Clubmoss	Spinulum annotinum	S5		X		X			X
White Meadowsweet	Spiraea alba	S5					X		X
Steeplebush	Spiraea tomentosa	S5					X		
Appalachian Ladies'-tresses	Spiranthes arcisepala	SU							
Nodding Ladies'-Tresses	Spiranthes cernua	S4? (AC CDC 2022)							
Rose Twisted-stalk	Streptopus lanceolatus	S5		X		X			
Lance-leaved Aster	Symphyotrichum lanceolatum	S4S5							
Calico Aster	Symphyotrichum lateriflorum	S5		X			X		

Common Name	Scientific Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)	Culturally Significant*	Hardwood-Dominant Forest	Softwood-Dominant Forest	Mixedwood Forest	Cut/ Disturbed	Bogs and Fens	Swamps and Marshes
New York Aster	<i>Symphotrichum novi-belgii</i>	S5					X		
Purple-stemmed Aster	<i>Symphotrichum puniceum</i>	S5							X
Common Dandelion	<i>Taraxacum officinale</i>	SNA					X		
Canada Yew	<i>Taxus canadensis</i>	S4S5							X
Tall Meadow-Rue	<i>Thalictrum pubescens</i>	S5							
Eastern Marsh Fern	<i>Thelypteris palustris</i>	S5						X	X
Rabbit's-foot Clover	<i>Trifolium arvense</i>	SNA					X		
Yellow Clover	<i>Trifolium aureum</i>	SNA					X		
White Clover	<i>Trifolium repens</i>	SNA					X		
Red Trillium	<i>Trillium erectum</i>	S4							
Painted Trillium	<i>Trillium undulatum</i>	S5		X	X	X			X
Eastern Hemlock	<i>Tsuga canadensis</i>	S4				X			
Coltsfoot	<i>Tussilago farfara</i>	SNA							
Broad-leaved Cattail	<i>Typha latifolia</i>	S5					X		
Late Lowbush Blueberry	<i>Vaccinium angustifolium</i>	S5	X		X		X		
Velvet-leaved Blueberry	<i>Vaccinium myrtilloides</i>	S5	X		X	X	X		X
Small Cranberry	<i>Vaccinium oxycoccos</i>	S5						X	X
American speedwell	<i>Veronica americana</i>	S5							
Common Speedwell	<i>Veronica officinalis</i>	SNA			X		X		
Northern Wild Raisin	<i>Viburnum cassinoides</i>	S5	X			X	X		X
Hobblebush	<i>Viburnum lantanoides</i>	S4		X		X			
Tufted Vetch	<i>Vicia cracca</i>	SNA					X		
Sweet White Violet	<i>Viola blanda</i>	S5							

Note:  
 Bolded entries represent Species at Risk (SAR) or Special of Conservation Concern (SOCC)

**Table A2: Field Lichen Master List for 2021 and 2022**

Common Name	Latin Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)
Eastern Candlewax Lichen	<i>Ahtiana aurescens</i>	S2S3
Shaggy Fringed Lichen	<i>Anaptychia palmulata</i>	S3S4
Ripple Ring Lichen	<i>Arctoparmelia centrifuga</i>	S5
Burred Horsehair Lichen	<i>Bryoria furcellata</i>	S5
Seastorm sp.	<i>Cetrelia</i> sp.	N/A
Fishnet Lichen	<i>Cladonia boryi</i>	S5
Organpipe Lichen	<i>Cladonia crispata</i>	S5
British Soldiers Lichen	<i>Cladonia cristatella</i>	S5
Trumpeting Lichen	<i>Cladonia fimbriata</i>	S5
Cup Lichen	<i>Cladonia gracilis</i>	S5
Giant Cladonia Lichen	<i>Cladonia maxima</i>	S5
Gray Reindeer Lichen	<i>Cladonia rangiferina</i>	S5
Reindeer Lichen	<i>Cladonia</i> sp.	SNA
Dragon Lichen	<i>Cladonia squamosa</i>	S5
Star-tipped Reindeer Lichen	<i>Cladonia stellaris</i>	S5
Newfoundland Reindeer Lichen	<i>Cladonia terrae-novae</i>	S5
Thorn Lichen	<i>Cladonia uncialis</i>	S5
Blistered Tarpaper Lichen	<i>Collema nigrescens</i>	S3
Tree Tarpaper Lichen	<i>Collema subflaccidum</i>	S5
Pink Earth Lichen	<i>Dibaeis baeomyces</i>	S5



Common Name	Latin Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)
Boreal Oakmoss Lichen	<i>Evernia mesomorpha</i>	S5
No Common Name	<i>Graphis scripta</i>	S5
Powdered Fringe Lichen	<i>Heterodermia speciosa</i>	S3S4
Freckled Tube Lichen	<i>Hypogymnia krogiae</i>	S5
Monk's Hood Lichen	<i>Hypogymnia physodes</i>	S5
Powder-headed Tube Lichen	<i>Hypogymnia tubulosa</i>	S5
Salted Starburst Lichen	<i>Imshaugia aleurites</i>	S4S5
Brown-bellied Toadskin Lichen	<i>Lasallia papulosa</i>	S5
No Common Name	<i>Lecanora thysanophora</i>	S5
No Common Name	<i>Lepra amara</i>	S5
Acadian Jellyskin Lichen	<i>Leptogium acadiense</i>	S3S4
Blue Jellyskin Lichen	<i>Leptogium cyanescens</i>	S5
Short-bearded Jellyskin Lichen	<i>Leptogium laceroides</i>	S4
Lungwort Lichen	<i>Lobaria pulmonaria</i>	S5
Textured Lungwort Lichen	<i>Lobaria scrobiculata</i>	S5
No Common Name	<i>Lopadium disciforme</i>	S5
No Common Name	<i>Loxospora ochrophaea</i>	SU
Abrading Camouflage Lichen	<i>Melanelixia subaurifera</i>	S5

Common Name	Latin Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)
Magic Flute Lichen	<i>Menegazzia terebrata</i>	S4S5
Mustard Kidney Lichen	<i>Nephroma laevigatum</i>	S5
Crabseye Lichen	<i>Ochrolechia androgyna</i>	S5
Mealy-rimmed Shingle Lichen	<i>Pannaria conoplea</i>	S4S5
Salted Shield Lichen	<i>Parmelia saxatilis</i>	S5
Bottlebrush Shield Lichen	<i>Parmelia squarrosa</i>	S5
Hammered Shield Lichen	<i>Parmelia sulcata</i>	S5
Black-bordered Shingles Lichen	<i>Parmeliella triptophylla</i>	S5
Powder-tipped Starburst Lichen	<i>Parmeliopsis capitata</i>	S5
Concentric Pelt Lichen	<i>Peltigera elisabethae</i>	S4S5
No Common Name	<i>Pertusaria macounii</i>	S5
Mealy Shadow Lichen	<i>Phaeophyscia orbicularis</i>	S4?
No Common Name	<i>Phaeophyscia rubropulchra</i>	N/A
A Frost Lichen	<i>Physconia grumosa</i>	SU
Varied Rag Lichen	<i>Platismatia glauca</i>	S5
Crumpled Rag Lichen	<i>Platismatia tuckermanii</i>	S5
Yellow Specklebelly Lichen	<i>Pseudocyphellaria holarctica</i>	S5
Rough Speckleback Lichen	<i>Punctelia rudecta</i>	S5
Mustard Lichen	<i>Pyxine soorediata</i>	S5

Common Name	Latin Name	AC CDC S-rank and Conservation Status (SARA, COSEWIC, NSESA)
Sinewed Ramalina Lichen	Ramalina americana	S5
Frayed Ramalina Lichen	Ramalina roesleri	S5
Smooth Lung Lichen	Ricasolia quercizans	S5
Frosted Glass-whiskers Lichen	Sclerophora peronella	S3S4
Frosted Glass-whiskers	Sclerophora peronella Atlantic pop.	S3S4 SARA SC COSEWIC SC
No Common Name	Thelotrema lepadinum	S5
Fringed Wrinkle Lichen	Tuckermannopsis americana	S5
Variable Wrinkle Lichen	Tuckermannopsis orbata	S5
Plated Rock Tripe	Umbilicaria muhlenbergii	S5
Rocktripe Lichen	Umbilicaria sp.	SNA
Methuselah's Beard Lichen	Usnea longissima	S4
Bushy Beard Lichen	Usnea strigosa	S5
Note: Bolded entries represent Species at Risk (SAR) or Special of Conservation Concern (SoCC)		

# Appendix B

## *Photographs*

Hardwood- Dominant Forest (August 3 and 4, 2022)



Softwood- Dominant Forest (September 21, 2022)



Mixedwood Forest (August 4 and October 15, 2022)



Cut/Disturbed (July 7, 2022)





Bogs and Fens (August 3 and 4, 2022)



Swamps and Marshes (October 18, 2021 and August 4, 2022)





Glossy Buckthorn  
(July 23, 2021)



Frosted Glass-whiskers  
(November 13, 2021)



Blistered Tarpaper Lichen  
(May 5, 2021)



Shaggy Fringed Lichen  
(April 27, 2021)



Powdered Fringe Lichen with Lungwort  
(April 27, 2021)



Acadian Jellyskin Lichen  
(November 13, 2021)



American Beech  
(September 29, 2022)



Acadian Jellyskin Lichen  
(November 13, 2021)

## Appendix C

### *Culturally Significant Vegetation Regional List*

November 10, 2021

**Attention: Regan Kelly**

**SUBJECT: Mi'kmaq vegetation list in support of Benjamin Mills and Westchester Wind Farm**

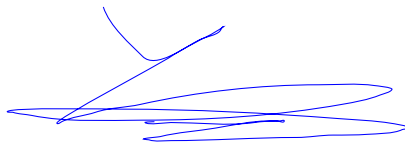
Dear Regan,

As per requested, Maqamigew Anqotumeg has provided Dillon Consulting a vegetation list in support of the Benjamin Mills and Westchester Wind Farm. A vegetation list of cultural importance for the Mi'kmaq Nation of Nova Scotia. A list established from a desktop analysis of the Site Plans (Figure 1 and Figure 2) provided by Dillon Consulting, including a review of the wetlands assessment completed by Strum Environmental in May 2012 for the Westchester Wind Power Project. The provided vegetation list in Table 1 refers to the areas inside of the Site Plans of Figures 1 and 2 only. The flora present in Table 1 are culturally significant to the Mi'kmaq Nation of Nova Scotia for herbal medicine and foraging and are believed to likely be present within the Site Plans of Benjamin Mills and Westchester Wind Farms. A field survey of the Site Plans should be cross referenced with the list provided by Maqamigew Anqotumeg in order to provide an accurate portrayal of the culturally significant flora within each Site Plans.

Thank you for providing Maqamigew Anqotumeg the opportunity to provide Dillon Consulting with this vegetation list and have endeavored to be thorough in our desktop analysis of the Site Plans for Benjamin Mills and Westchester Wind Farms. Should you have any questions, would like to clarify anything with this list or require any additional information, please do not hesitate to contact the undersign.

Regards,

**Maqamigew Anqotumeg**

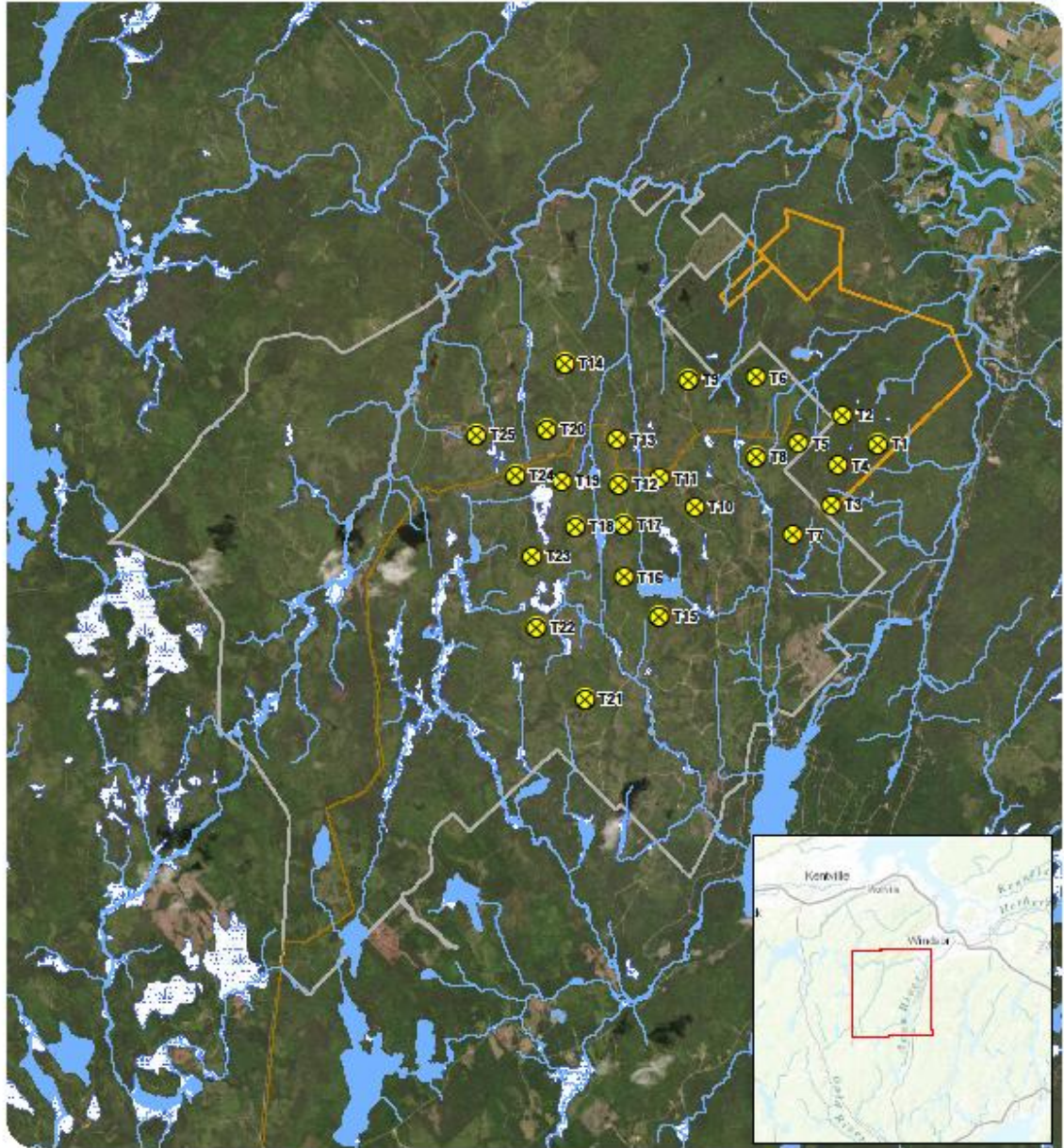


Lyle Vicaire, Terrestrial Biologist, MSc

Owner and Operator, Maqamigew Anqotumeg



**Figure 1 – Benjamin Mills Site Plan**



Natural Forces Developments LP  
Benjamin Mills Wind Farm  
Baseline Biophysical Surveys

Site Plan  
FIGURE #1

⊗ Turbine Locations  
— Existing Site Access

▭ Crown Land  
▭ Wagner Land

— Watercourse  
— Open Water  
— Wetland



MAP DRAWING INFORMATION:  
DATA PROVIDED BY: Natural Forces LP, GeoNova  
MAP CREATED BY: SSM  
MAP CHECKED BY: KR  
MAP PROJECTION: NAD 1983 UTM Zone 20N

200 0 200 400 600  
Meters  
SCALE 1:60,000



PROJECT 21-072

Date: 2011/05/14



Table 1 – Culturally significant flora to the Mi'kmaq Nation likely within the Site Plans of Benjamin Mills and Westchester Wind Farms

English Name	Scientific Name	Mi'kmaq Name
American Beech	<i>Fagus grandifolia</i>	<i>Suomusi</i>
American Larch	<i>Larix laricina</i>	<i>Ap'tamkiejit</i>
American Mountain-Ash	<i>Sorbus americana</i>	<i>Epsimusi</i>
American Red Raspberry	<i>Rubus idaeus</i>	<i>Klitaw</i>
Beaked Hazelnut	<i>Corylus cornuta</i>	<i>Mlipkanjmusi</i>
blackberry sp.	<i>Rubus</i>	<i>Ajioqjimanaqsi</i>
Bristly Black Currant	<i>Ribes lacustre</i>	<i>Misseminaqsi</i>
Choke Cherry	<i>Prunus virginiana</i>	<i>Elwimanaqsi</i>
Common Yarrow	<i>Achillea millefolium</i>	NA
Creeping Snowberry	<i>Gaultheria hispidula</i>	<i>Kna'ji'</i>
Dwarf Red Raspberry	<i>Rubus pubescens</i>	<i>Katomin</i>
Eastern White Pine	<i>Pinus strobus</i>	<i>Kuow</i>
Pin Cherry	<i>Prunus pensylvanica</i>	<i>Maskwe'simanaqsi</i>
Goldthread	<i>Coptis trifolia</i>	<i>Wisawkweskl</i>
Green Alder	<i>Alnus viridis</i>	<i>Tupsi</i>
Indian-Tobacco	<i>Lobelia inflata</i>	<i>Tmawey</i>
Large-Leaved Avens	<i>Geum macrophyllum</i>	NA
Blueberry species	<i>Vaccinium sp</i>	<i>Pkwiman</i>
Marsh Blue Violet	<i>Viola cucullate</i>	NA
Common Plantain	<i>Plantago major</i>	<i>Wijikanipkl</i>
Northern Blueflag	<i>Iris versicolor</i>	NA
Northern Wild Raisin	<i>Viburnum nudum</i>	<i>Skinaqanmusi</i>
Old Witch Panic-Grass	<i>Panicum capillare</i>	NA
Wintergreen	<i>Mitchella repens</i>	<i>Ka'qaujumnaqsi</i>
Pearly Everlasting	<i>Anaphalis margaritacea</i>	<i>Wapwasuek</i>
Red Clover	<i>Trifolium pratense</i>	NA
Elderberry	<i>Sambucus sp</i>	<i>Pukulu'skwimanaqsi</i>
Red Spruce	<i>Picea rubens</i>	<i>Mekwe'k kawatkw</i>
Sheep-Laurel	<i>Kalmia angustifolia</i>	NA
Skunk Currant	<i>Ribes glandulosum</i>	NA
Striped Maple	<i>Acer pensylvanicum</i>	<i>Wapoq</i>
Sugar Maple	<i>Acer saccharum</i>	<i>Snaweyey</i>
Swamp Red Currant	<i>Ribes triste</i>	NA
Sweet Fern	<i>Comptonia peregrina</i>	NA
Tall Butter-Cup	<i>Ranunculus acris</i>	NA
Virginia Strawberry	<i>Fragaria virginiana</i>	<i>Atuomkominaqsi</i>
Wild Sarsaparilla	<i>Aralia nudicaulis</i>	<i>Wopapa'kjukal</i>
Yellow Birch	<i>Betula alleghaniensis</i>	<i>Nimnoqn</i>