

APPENDIX A  
LAND USE BY LAW

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## 1.0 Background

The HRM has adopted a Regional Plan and Community Energy Functional Plan, recognizing the need for alternative sustainable energy and more specifically, the creation of new policies for the siting of wind energy facilities in HRM (HRM 2012). Three energy overlay zones have been created to reflect how wind energy facilities should be treated differently between the urban and rural areas of HRM. Based on the "Beaver Bank, Hammonds Plains, and Upper Sackville Land Use By-law" (2011) the proposed Project would be considered a "Large Wind Energy Facility".

## 2.0 Overview of Guidelines

Section 4.32 of the by-law indicates the Project site is situated within the Rural Wind Zone (RW-2) which permits all wind energy facilities, subject to a Development Permit, as well as several setbacks and guidelines as outlined in the by-law.

- i. All turbine towers shall have a minimum distance between turbines equal to the height of the tallest tower;
- ii. A minimum distance of 1000 m (3281 ft) from any habitable building on an adjacent property;
- iii. A minimum distance of 1.0 times the tower height from any adjacent property boundary;
- iv. The installation and design shall conform to applicable industry standards;
- v. All structural, electrical and mechanical components of the Wind Energy Facility shall conform to relevant and applicable local, provincial and national codes;
- vi. All electrical wires shall, to the maximum extent possible, be placed underground;
- vii. The visual appearance of the Wind Energy Facility shall at a minimum:
  - o Be a non-obtrusive colour such as white, off-white or gray;
  - o Not be artificially lit, except to the extent required by the Federal Aviation Act or other applicable authority that regulates air safety; and
  - o Not display advertising (including flags, streamers or decorative items), except for identification of the turbine manufacturer, facility owner and operator.
- viii. The siting of Wind Energy Facilities is subject to the requirements for Watercourse Setbacks and Buffers set out in the Land Use By-law;
- ix. The siting of all accessory buildings are subject to the general set back provision for building under the By-law.

All setback requirements from any Wind Energy Facility to a property boundary may be waived where the adjoining property is part of and forms the same Wind Energy Facility. All Wind Energy Facilities require a development permit. The permit application shall contain the following:

- a) a description of the proposed Wind Energy Facility, including an overview of the project, the proposed total rated capacity of the Wind Energy Facility;
- b) the proposed number, representative types, and height or range of heights of wind turbine towers to be constructed, including their generating capacity, dimensions, respective manufacturers, and a description of accessory facilities;
- c) identification and location of the properties on which the proposed Wind Energy Facility will be located;

- d) at the discretion of the Development Officer, a survey prepared by a Nova Scotia Land Surveyor, a surveyor's certificate, or a site plan showing the planned location of all wind turbines towers, property lines, setback lines, access roads, turnout locations, substation(s), electrical cabling from the Wind Energy Facility to the substation(s), ancillary equipment, building(s), transmission and distribution lines. The site plan must also include the location of all structures and land parcels, demonstrating compliance with the setbacks and separation distance where applicable;
- e) at the discretion of the Development Officer, proof of notification to the Department of National Defense, NAV Canada, Natural Resources Canada and other applicable agencies regarding potential radio, telecommunications, radar and seismoacoustic interference, if applicable, to Transport Canada and the *Aviation Act*, and
- f) any other relevant information as may be requested by the Halifax Regional Municipality to ensure compliance with the requirements of this By-law.

Additional permit requirements may include the following:

- a) The Development Permit application shall be reviewed by a Municipal Building Official to determine if design submissions are required from a Professional Engineer to ensure that the wind turbine base, foundation, or guy wired anchors required to maintain the structural stability of the wind turbine tower(s) are sufficient where a wind turbine is:
  - i. not attached to a building and is not connected to the power grid;
  - ii. attached to an accessory building in excess of 215 ft<sup>2</sup> and is not connected to the power grid.
- b) A minimum of 60 day before the date a development permit application is submitted, an applicant shall send a notice to all assessed property owners of property that is within 2000 m (6560 ft) from the boundary of the property upon which any large wind energy facility is proposed.
- c) The notice pursuant to section b) shall include the following information:
  - i. A site plan that includes property boundaries and the location of the proposed wind energy facility;
  - ii. A description of the type of wind energy facility; and
  - iii. The applicant's contact information which shall include a mailing address.

### 3.0 References

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APPENDIX B  
ENVIRONMENTAL PROTECTION PLAN SUGGESTED  
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APPENDIX C  
HUMAN HEALTH AND WIND FARMS – A LITERATURE  
REVIEW

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In support of the Environmental Assessment (EA) for the Chebucto Pockwock Community Wind Project, a review was completed of current available literature on the potential effects on human health related to wind energy. Several key health-related issues were identified, and Project-specific studies were completed to address shadow flicker, electromagnetic interference (EMI), visual impacts and sound. Details of these studies are provided in Section 12.0 of the "Environmental Assessment Registration Document".

The following sections provide the reader with additional background information on the potential effects of electromagnetic fields (EMFs), air quality, ice throw/shedding and infrasound on human health.

### Electromagnetic Fields

EMFs are a type of energy that occurs naturally and is also created through the use of electrical appliances and equipment (i.e. cell phone usage, radio towers, etc.) (City of Toronto 2011). A guidebook to Wind Energy Development was produced in 2011 and identified transmission lines, wind turbine generators, generator transformers and underground cables as the four potential sources of EMFs as a result of wind farm operations (CanWEA 2011). The guidebook goes on to suggest that EMF exposure is not significant due to low emission levels produced by wind farm operations and indicates that generator transformers likely generate the highest levels of EMFs. Similar conclusions have been made by Health Canada and the World Health Organization (CMOHO 2010).

In 2007, a study was completed to assess the possible effects of EMFs on human health. The study concluded that there is little evidence to support the theory that EMFs cause long term health issues (SCENIHR 2007). As well, a study led by the National Institute of Environmental Health Sciences assessed scientific evidence spanning over 6 years, to determine whether exposure to EMF could result in a potential risk to human health. Results indicated that there were no consistent patterns of biological effects with animals or with cells (EMF RAPID 2002).

Health Canada states that "research has shown that EMFs from electrical devices and power lines can cause weak electric currents to flow through the human body. However, these currents are much smaller than those produced naturally by your brain, nerves and heart, and are not associated with any known health risks" (Health Canada 2010). Health Canada goes on to state that EMFs are strongest when close to the source so that at greater distances, the strength of the field fades rapidly and humans need not engage in specific actions to minimize risk including those who are located just outside the boundaries of power line corridors (Health Canada 2010).

### Air Quality

The development and construction phases of a wind energy project may affect local air quality, by increasing air borne dust associated with on-site equipment, and vehicles. Emissions from vehicles and equipment can also contribute to a reduction in local air quality.



The American Wind Energy Association (AWEA) states that the generation of electricity from the wind does not result in any air emissions (AWEA 2010). Similarly, the US Environmental Protection Agency (EPA) recognizes that the emissions associated with wind technology are negligible because no fuels are combusted. Therefore, wind energy production offsets more polluting forms of energy generation and can actually improve air quality and our health.

#### Ice Throw and Ice Shedding

Under appropriate temperature and humidity conditions, ice can build up on the rotor blades, nacelle and tower of a wind turbine, which can lead to two types of risk:

- ice fragments dislodge and are shed from the rotor of the operating turbine due to aerodynamic and centrifugal forces; and
- ice fragments dislodge from the structure and fall to the ground when it is shut down or idling without power production (CanWEA 2007).

A recent German paper provides a formula for a safe setback distance assuming that the turbines will be shut down in icy conditions (Seifert et al. 2003). The turbines selected for the Project will be equipped with turbine deactivation technology, which detects rotor imbalance caused by ice formation on blades, and triggers the turbine to automatically shut down in icy conditions. The use of this technology will significantly reduce the risk of ice throw, though ice may still fall from the blades and be blown by the wind some distance. The following equation is used to calculate a safe setback distance, accounting for this possibility:

$$d = ((D/2 + H) / 15)v$$

where:

d = the best practice setback distance

D = the rotor diameter of the turbine

H = the hub height of the turbine

V = wind speed (m/s)

Turbines for the proposed Project have been located greater than 667 m (alternate turbine location 1) from the nearest provincial road (Pockwock Road), greater than 1 km from the nearest residence, 229 m (turbine 2) from the nearest year-round building (J. Douglas Kline Water Supply Plant), and 5.8 km (turbine 5) from the nearest recreational campground. Though a final decision has not been made on the turbine model to be employed by the Project, it will likely be a model with a 95 m hub height, and a 55 m rotor diameter. The only potential risk from ice throw in this scenario would be to staff of the J. Douglas Kline Water Supply Staff. Based on the above formula, the 244 m setback distance would be suitable up to a wind speed of about 95 km/h. The maximum hourly wind speed recorded at the nearest meteorological station (Halifax International Airport) between 1971-2000 was 89 km/h, recorded on February 10<sup>th</sup>, 1969, with the highest single wind gust measured at 132 km/h on December 26<sup>th</sup>, 1976 (EC 2011a). Therefore, the combination of wind speed and direction that would result in ice reaching the water plant is extremely unlikely to occur.

The mitigative strategies described above will decrease and/or eliminate the risk of injury from ice to nearby workers and land users. In addition, the following additional mitigation strategies will be implemented:

- physical and visual warnings (i.e. signs and fences);
- turbine deactivation during periods of ice accumulation; and
- restriction of access to trained site personnel (Wahl and Giguere 2006).

Infrasound

*General Background - Sound*

Humans detect sound from changes in pressure that travel through the air and cause the eardrum and small bones of the middle ear to vibrate. The vibrations are transmitted to the inner ear where sensory hair cells then change the vibrations into nerve impulses, which travel to the brain where they are perceived and interpreted.

The magnitude (loudness) of sound is described as “pressure level”, “sound level” or “noise level” and is measured as decibels (dB). Typical sound levels, measured in decibels, are shown in Table A.

**Table A: Typical Sound Levels**

Source	Distance from Source		Sound Pressure Levels (dBA)
	feet	meters	
Freight train	100	30	70
Vacuum Cleaner	10	3	70
Freeway	100	30	70
Wind in trees	40	12	55
Light traffic	100	30	70
Average home			50
Soft whisper	5	2	30
Quiet bedroom			20

Source: AWEA 2011

The tonal quality or pitch of the sound is related to its frequency and is measure in hertz (Hz). The normal frequency range of sounds that humans can hear (known as audible sound) extends from about 20-50 Hz (a rumbling sound) up to high frequency of about 10,000-15,000 Hz (hissing sound) or even higher for some people. Humans generally hear best in the mid-frequency range of 500-4,000 Hz.

*General Background - Infrasound*

Infrasound is very low-frequency sound, that is typically defined as being between 1-20 Hz, which is below what human ears can normally hear.

Infrasound is everywhere in the environment. It is emitted from natural sources (e.g. wind, rivers) and from artificial sources including road traffic, aircraft, and ventilation systems. The most common source of infrasound that humans encounter is vehicles (CMOH 2010).

When evaluating potential effects of infrasound, it is important that these frequencies be discussed in the context of the sound pressure levels, or in other words, the loudness of the sound. For instance, very loud sounds at very low frequencies (i.e. 165 dB at 2 Hz, reducing to 145 dB at 20 Hz) may result in pain (Leventhall 2006) and infrasound has been shown to cause annoyance, when the sound level exceeds the threshold of hearing (i.e. the lowest sound levels that a listener can detect) (HGC 2010). Further, research shows that to be physically felt, infrasound must exceed 100–110 dB (Ellenbogen *et al.* 2012).

While there is some variation in the literature and between individual sensitivities, there is fairly good agreement on the level of the threshold of hearing among the various studies that have been completed (Figure 1).

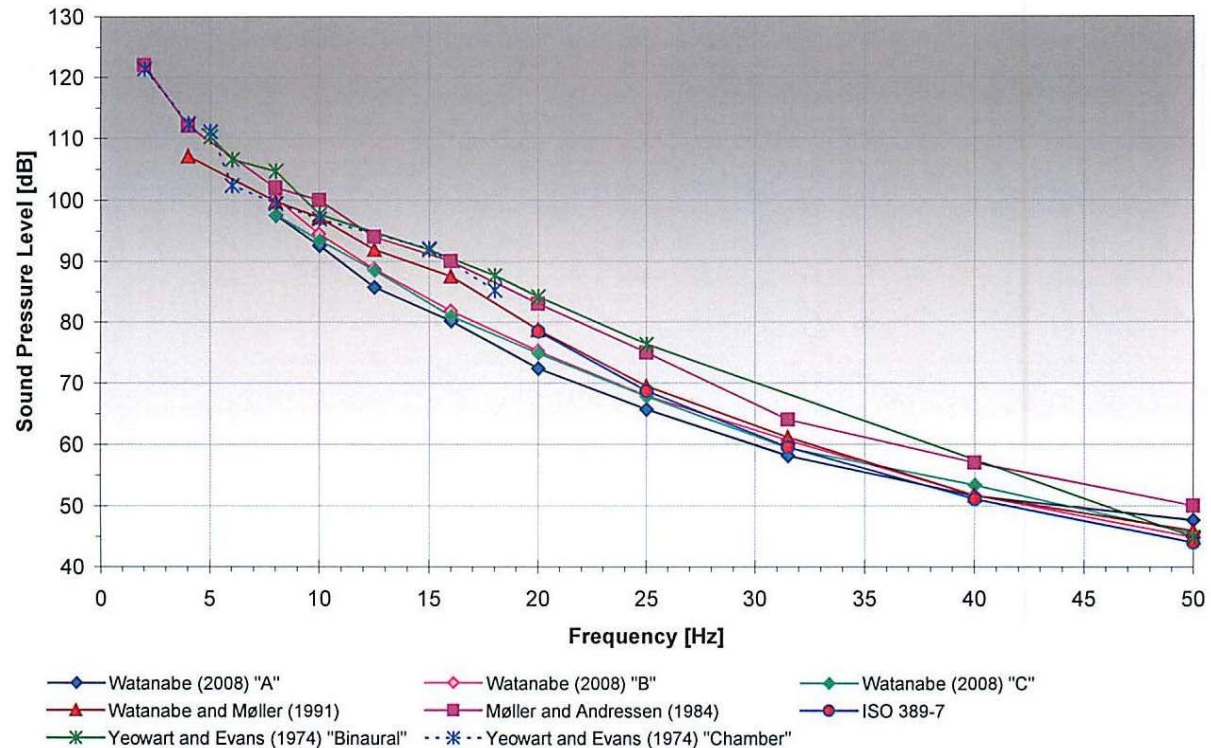


Figure 1: Threshold of Hearing Data from Various Papers (HGC 2010).

What these results show is that the lower the frequency of the sound, the louder the sound needs to be in order to be perceived.

*Measured Infrasound Levels*

In 2010, Sonus, an acoustic consulting firm based in South Australia, completed a study to measure infrasound produced by a range of natural and manmade sources using a methodology specifically designed to measure infrasound (Table B, Figure 2). The G-weighting network was applied to the measured infrasound pressure levels as it has been standardized to determine the human perception (i.e. threshold of hearing) and annoyance due to noise that lies within the infrasound frequency range. By comparison, when measuring audible sound levels, meters are usually equipped with weighting circuits to simulate the frequency response characteristics of the human ear. The A-weighting filter is normally used as it correlates well with the human perception of most sounds. Sound levels measured using the G and A-weighting filters are expressed as dBG and dBA, respectively.

**Table B: Measured Levels of Infrasound from Natural and Manmade Sources**

Source	Infrasound Level (dBG)
Threshold of hearing	85 dBG
Wind Farm (360 m downwind) (CGWF)	61 dBG
100 m downwind from wind farm (CBWF)	66 dBG
200 m downwind from wind farm (CBWF)	63 dBG
Ambient infrasound (100 m from nearest turbine with negligible wind and no turbine operation) (CBWF)	62 dBG
Inside a residence (fridge operating) (1200m from nearest turbine)	51 dBG
Outside a residence (1200m from nearest turbine)	58 dBG
Adjacent to the beach (25 m from high water mark)	75 dBG
Cliff face (250 m from the coastline)	69 dBG
Inland forest (8 km from the coastline)	57 dBG
Gas fired power station (350 m)	74 dBG
Business District (70 m from two major road corridors)	76 dBG

Source: Sonus Pty Ltd 2010

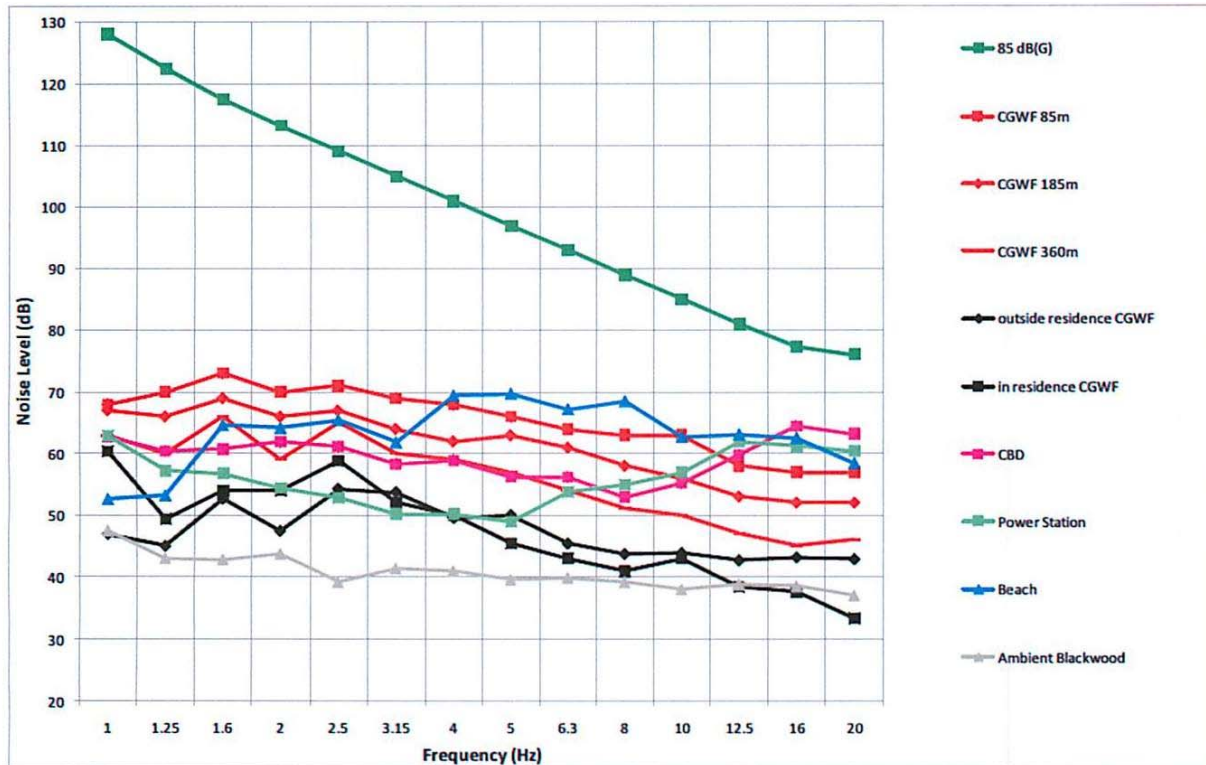


Figure 2: Summary of Measurement at the Clements Gap Wind Farm and Other Sources (Sonus Pty Ltd 2010)

The results of the study indicate that while turbines do produce infrasound, levels are well below established levels that can be perceived by humans and are comparable to natural and urban sources that are common in the environment.

Another recent Australian report also measured levels of infrasound within typical environments in South Australia, with a particular focus on comparing wind farm environments to urban and rural environments away from wind farms. The study concluded that measured infrasound levels at rural locations both near to and away from wind farms were no higher than infrasound levels measured at the urban locations (Figure 3). Human activity and traffic were the main sources of infrasound at urban locations, while localized wind conditions were found to be the main source of infrasound in rural locations. All measurements were below the levels that can be perceived by humans, with most by a significant margin (Evans *et al.* 2013).

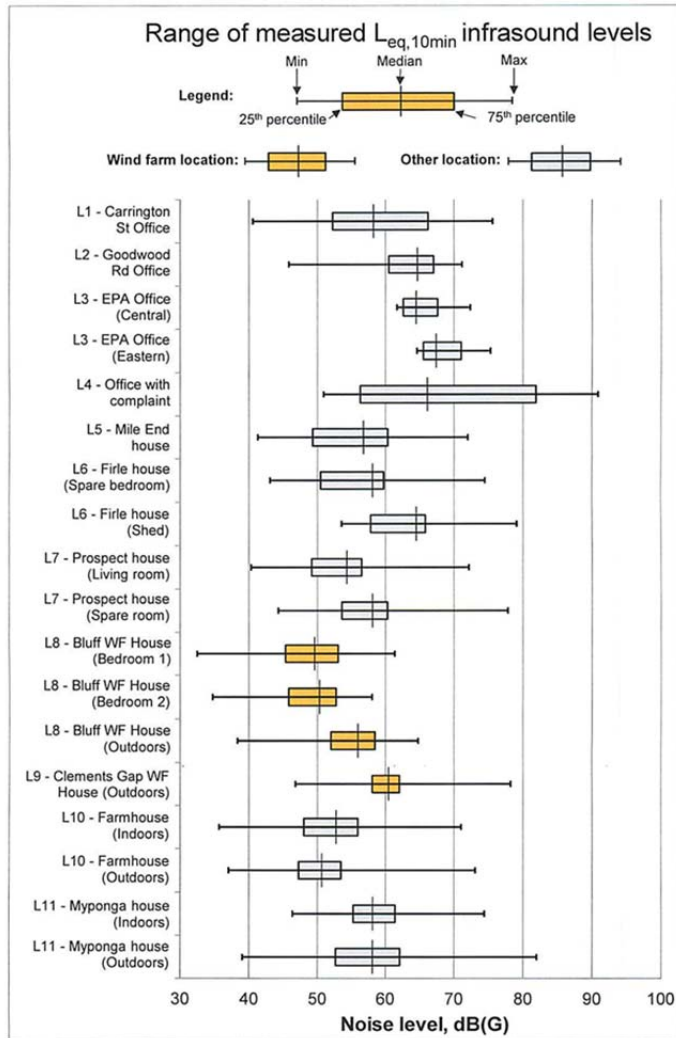


Figure 3: Range of Measured Infrasound Levels (Evans et al. 2013).

An investigation was also completed at a wind farm in Pubnico, Nova Scotia to, in part, evaluate infrasound levels at a residence within 330 m of the closest turbine (HGC 2006). Similar to other results from wind farms, infrasound levels were found to be well below the level of sound that can be perceived by humans, as shown in Figure 4.

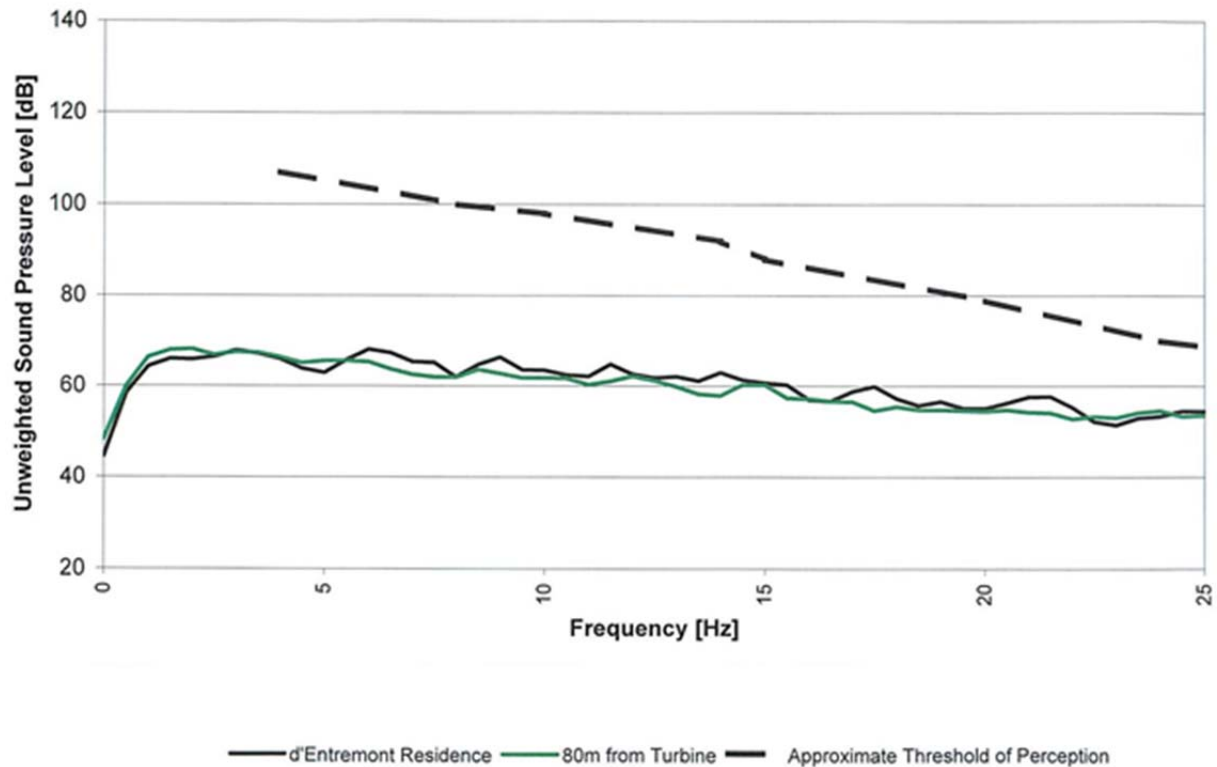


Figure 4: Infrasound Measurements at Pubnico Wind Farm (HGC 2006).

#### *Infrasound and Health Concerns*

Concern about infrasound from wind turbines may have originated from the experience of neighbours of early wind turbine designs with downwind rotors (rotors downwind of the tower). In contrast, all modern utility scale wind turbines have upwind rotors that produce significantly lower infrasound emissions (Bastasch *et al.* 2006).

Several studies and panels have been assembled to evaluate the perceived health effects associated with wind turbines.

A scientific advisory panel with expertise in audiology, acoustics, occupational/environmental medicine, and public health was assembled by the wind industry in early 2009 to conduct a review of current literature available on the issue of perceived health effects of wind turbines (Colby *et al.* 2009). Following their review and analysis of the information, the panel reached consensus on the following conclusions:

- There is no evidence that the audible or sub-audible sounds emitted by wind turbines have any direct adverse physiological effects.
- The ground-borne vibrations from wind turbines are too weak to be detected by, or to affect, humans.

- The sounds emitted by wind turbines are not unique. There is no reason to believe, based on the levels and frequencies of the sounds and the panel's experience with sound exposures in occupational settings, that the sounds from wind turbines could plausibly have direct adverse health consequences.

The Chief Medical Officer of Health in Ontario also conducted a review of papers and reports (from 1970 to date) on wind turbines and health from scientific bibliographic databases, grey literature, and from a structured Internet search. The report concluded that “low frequency sound and infrasound from current generation upwind model turbines are well below the pressure sound levels at which known health effects occur. Further, there is no scientific evidence to date that vibration from low frequency wind turbine noise causes adverse health effects” (CMOH 2010).

The Massachusetts Department of Environmental Protection in collaboration with the Massachusetts Department of Public Health recently convened a panel of independent experts to identify any documented or potential health impacts of risks that may be associated with exposure to wind turbines, and, specifically, to facilitate discussion of wind turbines and public health based on scientific findings. The panel concluded that “measured levels of infrasound produced by modern upwind wind turbines at distances as close as 68 m are well below that required for non-auditory perception”. Further, the panel concluded that “the weight of the evidence suggests no association between noise from wind turbines and measures of psychological distress or mental health problems” (Ellenbogen *et al.* 2012).

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APPENDIX D  
WETLAND METHODOLOGY AND CHARACTERIZATIONS

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## **WETLAND DELINEATION IDENTIFICATION METHODOLOGY**

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### **Wetlands and Watercourses in Nova Scotia**

Wetlands in Nova Scotia are regulated by NSE under Section 105 of the *Environment Act*. Under the Act, wetlands are:

*Land referred to as a marsh, swamp, fen, or bog that either periodically or permanently has water table at, near, or above the land surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation, and biological activities adapted to wet conditions.*

Watercourses are defined in the *Environment Act* as:

*Any creek, brook, stream, river, lake, pond, spring, lagoon, or any other natural body of water, and includes all the water in it, and also the bed and the shore (whether there is actually any water in it or not). It also includes all groundwater.*

Watercourses are defined in Halifax Regional Municipality (HRM) land use by-laws as:

*A lake, river, stream, ocean, or other natural body of water.*

### **Delineation Methodology**

In order for a wetland determination to be made, the following three criteria were assessed the field:

- Presence of hydrophytic (water loving) vegetation;
- Presence of hydrologic conditions that result in periods of flooding, ponding, or saturation during the growing season; and
- Presence of hydric soils (anaerobic conditions in upper part).

Although detailed data point analysis was not completed within the study areas, soil pits were completed frequently to confirm the presence/absence of wetland hydrology and hydric soils, as per the methodology below. A general vegetation survey was also completed within the wetlands to confirm hydrophytic vegetation.

#### Identification of Hydrophytic Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). Hydrophytic vegetation should be the dominant plant type in wetland habitat (Environmental Laboratory 1987).

## WETLAND DELINEATION IDENTIFICATION METHODOLOGY

Dominant plant species observed in each wetland were classified according to indicator status (probability of occurrence in wetlands), in accordance with the U.S. Fish and Wildlife Service (USFWS) National List of Vascular Plant Species that Occur in Wetlands: NE Region (Region 1) (Reed 1988). Please refer to Table 1 (below) for these classifications. These indicators are used as this region most closely resembles the flora of Nova Scotia and climate regime. Further relevant information was reviewed in Flora of Nova Scotia (Zinck, 1998).

**Table 1: Classification of Wetland-Associated Plant Species<sup>1</sup>**

Plant Species Classification	Abbreviation <sup>2</sup>	Probability of Occurring in Wetland
Obligate	OBL	>99%
Facultative Wetland	FACW	66-99%
Facultative	FAC	33-66%
Facultative Upland	FACU	1-33%
Upland	UPL	<1%
No indicator status	NI	Insufficient information to determine status
Plants That Are Not Listed (assumed upland species)	NL	Does not occur in wetlands in any region.

<sup>1</sup> Source: Reed 1988

<sup>2</sup> A '+' or '-' symbol can be added to the classification to indicate greater or lesser probability, respectively, of occurrence in a wetland.

If the majority (greater than 50%) of the dominant vegetation at a data point is classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC), then the location of the data point is considered to be dominated by hydrophytic vegetation.

### Identification of Hydric Soils

A hydric soil is a soil that has formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA-NRCS 2010). Indicators of the presence of a hydric soil include soil colour (gleyed soils and soils with bright mottles and/or low matrix chroma), aquic or preaquic moisture regime, reducing soil conditions, sulfidic material (odour), soils listed on the hydric soils list, iron and manganese concretions, organic soils (histosols), histic epipedon, high organic content in surface layer in sandy soils, and organic streaking in sandy soils.

Soil pits were excavated to a maximum depth of 40 cm or refusal. The soil in each was then examined for hydric soil indicators. The matrix colour and mottle colour (if present) of the soil were determined using the Munsell Soil Colour Charts.

### Determination of Wetland Hydrology

Wetland habitat, by definition, either periodically or permanently, has a water table at, near, or above the land surface or that is saturated with water. To be classified as a wetland, a site should have at least one primary indicator or two secondary indicators of wetland hydrology, as shown in Table 2.

## WETLAND DELINEATION IDENTIFICATION METHODOLOGY

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**Table 2: Indicators of Wetland Hydrology**

Examples of Primary Indicators	Examples of Secondary Indicators
Water marks	Oxidized Root Channels in the Upper 30 cm
Drift Lines	Local Soil Survey Data
Sediment Deposition	Dry season Water Table
Drainage Patterns	Stunted or Stressed Plants
Water-stained leaves	
Visual Observation of Saturated Soils	
Visual Observation of Inundation	

Wetland habitat is assessed for signs of hydrology, via visual observations across the area and through assessment of soil pits.

### References

Environmental Laboratory (1987), Corps of Engineers Wetlands Delineation Manual, US Army Corp of Engineers, 1987.

Reed. 1988. National List of Plant Species that Occur in Wetlands: NE Region (Region 1) U.S. Fish and Wildlife Service, Washington, DC.

USDA-NRCS. (United States Department of Agriculture- Natural Resources Conservation Service). 2010. *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils*. Version 7.0. 53 pp.

Zinck, M. 1998. *Rolands Flora of Nova Scotia*. Nimbus Publishing, Nova Scotia.

Environmental Laboratory. (1987). "Corps of Engineers wetlands delineation manual," [Technical Report Y-87-1](#), U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. NTIS No. AD A176 912 (Note: Appendix C information is outdated and must be obtained from regional Wetlands offices)

Table D1: Wetland Characteristics: Chebucto Pockwock Community Wind Project

WETLAND ID	WETLAND TYPE	LANDSCAPE POSITION	LANDFORM	WATER FLOW	SOIL TYPE	SURFACE/HYDROLOGIC CONDITIONS	WETLAND BOUNDARY	DOMINANT VEGETATION			WATERCOURSE/WATER BODY PRESENT
								Herbs	Shrubs	Trees	
1 (south)	Marsh	Terrene	Basin / slope	Throughflow (entrenched)	Organic over bedrock (A1 - Histosol)	1) Groundwater at 10 cm 2) Saturated at surface 3) Surface water 4) Water stained leaves	Moderate to steep	narrow-leaved cat-tail ( <i>Typha angustifolia</i> ); woolly bullrush ( <i>Scirpus cyperinus</i> ); wild sarsaparilla ( <i>Aralia nudicaulis</i> )	None	None	Watercourse 2 flows through this wetland. Watercourse 3a and 3b also source this wetland from the east. The wetland is drained by watercourse 2 to the north.
1 (north)	Treed swamp	Lotic stream confined	Basin	Throughflow	Organic over depleted mineral (A2 – Histic epipedon)	1) Saturated at surface 2) Hydrogen sulphide odour 3) Oxidized rhizosphere	Gentle	cinnamon fen ( <i>Osmunda cinnamomea</i> ); hay scented fern ( <i>Dennstaedtia punctilobula</i> ); three-seede sedge ( <i>Carex trisperma</i> ); bunchberry ( <i>Cornus canadensis</i> )	mountain holly ( <i>Nemopanthus mucronata</i> ); Canada holly ( <i>Ilex verticillata</i> ); balsam fir ( <i>Abies balsamea</i> )	black spruce ( <i>Picea mariana</i> ); white birch ( <i>Betula papyrifera</i> ); red maple ( <i>Acer rubrum</i> )	
2	Treed swamp	Terrene	Basin	Outflow	Organic over depleted mineral (A2 – Histic epipedon)	1) Saturated at surface 2) Surface water (5 to 10 cm deep)	Gentle	cinnamon fern; New York fern ( <i>Thelypteris noveboracensis</i> )	balsam fir; black spruce	red maple; yellow birch ( <i>Betula alleghaniensis</i> ); black spruce	This wetland is drained to the north by watercourse 6.
3	Treed swamp	Terrene	Basin	Inflow	Organic over depleted mineral (A2 – Histic epipedon)	1) Saturated at surface 2) Hydrogen sulfide odour in soil 3) Oxydized rhizosphere	Gentle to moderate	cinnamon fern; hay scented fern; rice cut grass ( <i>Leersia oryzoides</i> ); three-seeded sedge	balsam fir; mountain holly; black spruce; red maple	red maple; black spruce; yellow birch	Ephemeral drainage inflow along an old road from the north and south.
4	Treed swamp	Lotic stream confined	Basin	Throughflow	Organic over bedrock (A1 - Histosol)	1) Saturated at surface 2) Surface water (10 to 20 cm) 3) Groundwater at 15 cm	Gentle to moderate	cinnamon fern; New York fern; three-seeded sedge	balsam fir; yellow birch	red maple; white birch; black spruce; balsam fir	Watercourse 3a flows through this wetland.
5	Marsh	Lotic stream outflow	Basin	Outflow	Organic over bedrock (A1 - Histosol)	1) Groundwater at 10 cm 2) Surface water 3) Saturated at surface	Moderate to steep	balsam fir; wild sarsaparilla; narrow-leaved cat-tail	black spruce; red maple	black spruce; yellow birch	Watercourse 2 flows out of this wetland at its northern boundary. The wetland is sourced in part from seepage from the water treatment facility's filtrate lagoons.
6 (north)	Treed swamp	Terrene	Flat	Outflow (inferred)	Organic over bedrock (A1 - Histosol)	1) Groundwater at 10 cm 2) Surface water 3) Saturated at surface	Gentle	cinnamon fern; beech fern ( <i>Phegopteris connectilis</i> ); lambkill ( <i>Kalmia angustifolia</i> )	black spruce; mountain holly	red maple	Likely sourced in part by seepage from the water treatment facility's filtrate lagoons.
6 (south)	Treed swamp	Terrene	Basin / slope	Outflow (inferred)	Organic over depleted mineral (A2 – Histic epipedon)	1) Saturated at surface 2) Surface water 3) Hydrogen sulfide odour in soil	Gentle	cinnamon fern; three-seeded sedge; balsam fir	balsam fir	black spruce; red maple	
7	Vernal pool	Terrene	Basin	Isolated	Unknown	1) Standing water (40 to 50 cm) 2) Aquatic flora	Moderate	Aquatic herbs; woolly bullrush (around peripheries)	None	None	None

WETLAND ID	WETLAND TYPE	LANDSCAPE POSITION	LANDFORM	WATER FLOW	SOIL TYPE	SURFACE/HYDROLOGIC CONDITIONS	WETLAND BOUNDARY	DOMINANT VEGETATION			WATERCOURSE/WATER BODY PRESENT
								Herbs	Shrubs	Trees	
8	Treed swamp	Terrene	Basin	Isolated	Organic over bedrock (A1 - Histosol)	1) Saturated at surface 2) Surface water	Gentle	cinnamon fern; three-seeded sedge; New York fern	balsam fir	black spruce; yellow birch	None
9 (northeast)	Treed swamp	Lotic stream confined	Basin	Outflow	Organic over bedrock (A1 - Histosol)	1) Groundwater at 10 cm 2) Surface water 3) Saturated at surface	Moderate	cinnamon fern; balsam fir	speckled alder ( <i>Alnus incana</i> ); balsam fir	None	Watercourse 8 drains this wetland to the east.
9 (southeast)	Treed swamp	Terrene	Basin	Outflow	Organic over bedrock (A1 - Histosol)	1) Saturated at surface	Gentle	cinnamon fern; New York fern	balsam fir	red maple; balsam fir	
10	Treed Swamp	Terrene	Basin	Outflow (ephemeral)	Organic over bedrock (A1 - Histosol)	1) Groundwater at 10 cm 2) Surface water 3) Saturated at surface	Moderate	balsam fir; red maple; lambkill	black spruce; red maple	black spruce	Ephemeral drainage outflow to the east.
11	Treed swamp	Lotic stream confined	Basin	Outflow	Organic over bedrock (A1 - Histosol)	1) Saturated at surface 2) Standing water 3) Water stained leaves	Gentle	cinnamon fern; three-seeded sedge;	balsam fir; Canada holly	balsam fir; black spruce; red maple	Watercourse 9 drains this wetland to the southeast.
12 (west)	Shrub swamp	Terrene	Basin	Outflow (ephemeral)	Organic over depleted mineral (A2 - Histic epipedon)	Saturated at surface	Gentle	cinnamon fern	mountain holly; balsam fir; red maple	None	Ephemeral drainage to the southwest.
12 (east)	Treed swamp	Terrene	Flat / slope	Outflow (ephemeral)	Organic over bedrock (A1 - Histosol)	1) Groundwater at 10 cm 2) Surface water 3) Saturated at surface 4) Water stained leaves	Gentle	cinnamon fern; interrupted fern ( <i>Osmunda claytoniana</i> )	Canada holly; black spruce; red maple	black spruce; red maple	Ephemeral drainage to the east.
13	Treed swamp	Terrene	Basin	Outflow (ephemeral)	Organic over bedrock (A1 - Histosol)	1) Groundwater at 10 cm 2) Surface water 3) Saturated at surface 4) Water stained leaves	Gentle	cinnamon fern; interrupted fern ( <i>Osmunda claytoniana</i> )	Canada holly; yellow birch	black spruce; red maple	Ephemeral drainage to the southeast.
14	Treed swamp	Terrene	Flat / slope	Throughflow (entrenched)	Organic over depleted mineral (A2 - Histic epipedon)	1) Saturated at surface 2) Groundwater at 15 cm 3) Surface water (10 to 15 cm deep) 4) Water-stained leaves 5) Drainage patterns	Gentle	cinnamon fern; New York fern; hay scented fern; three-seeded sedge	balsam fir; black spruce	black spruce; balsam fir; white birch; yellow birch	Watercourses 11, 12, and 13 flow through this wetland through entrenched channels.
15	Marsh	Terrene	Basin	Throughflow (entrenched)	Organic over depleted mineral (A2 - Histic epipedon)	1) Groundwater at 12 cm 2) Saturated at surface 3) Pools of standing water	Moderate	water-horsetail ( <i>Equisetum fluviatile</i> ); narrow-leaved cat-tail	speckled alder; yellow birch	None	Watercourse 10 enters the wetland from the north abutting the road. The desktop review indicates this wetland drains to the north beyond the assessed area.



APPENDIX E  
ACCDC AND PROJECT SITE PLANT LISTS

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Common Name	Scientific Name	NSDNR Status	COSEWIC Status	SARA Status	NSESA Status
Vascular Plants					
Chinese Hemlock-parsley	<i>Conioselinum chinense</i>	Yellow	Not Listed	Not Listed	Not Listed
Eastern Lilaeopsis	<i>Lilaeopsis chinensis</i>	Yellow	Special Concern	Special Concern	Vulnerable
Blunt Sweet Cicely	<i>Osmorhiza depauperata</i>	Red	Not Listed	Not Listed	Not Listed
Smooth Sweet Cicely	<i>Osmorhiza longistylis</i>	Red	Not Listed	Not Listed	Not Listed
Clustered Sanicle	<i>Sanicula odorata</i>	Red	Not Listed	Not Listed	Not Listed
Golden Alexanders	<i>Zizia aurea</i>	Red	Not Listed	Not Listed	Not Listed
Rosy Pussytoes	<i>Antennaria rosea</i>	Red	Not Listed	Not Listed	Not Listed
Parlin's Pussytoes	<i>Antennaria parlinii</i>	Red	Not Listed	Not Listed	Not Listed
Hyssop-leaved Fleabane	<i>Erigeron hyssopifolius</i>	Yellow	Not Listed	Not Listed	Not Listed
Philadelphia Fleabane	<i>Erigeron philadelphicus</i>	Yellow	Not Listed	Not Listed	Not Listed
Coastal Plain Joe-pye-weed	<i>Eutrochium dubium</i>	Red	Not Listed	Not Listed	Not Listed
Robinson's Hawkweed	<i>Hieracium robinsonii</i>	Yellow	Not Listed	Not Listed	Not Listed
Big-leaved Marsh-elder	<i>Iva frutescens</i>	Yellow	Not Listed	Not Listed	Not Listed
Hairy Lettuce	<i>Lactuca hirsuta</i>	Yellow	Not Listed	Not Listed	Not Listed
Water Beggarticks	<i>Bidens beckii</i>	Yellow	Not Listed	Not Listed	Not Listed
Cut-Leaved Coneflower	<i>Rudbeckia laciniata</i>	Yellow	Not Listed	Not Listed	Not Listed
Seabeach Ragwort	<i>Senecio pseudoarnica</i>	Yellow	Not Listed	Not Listed	Not Listed
Hairy Goldenrod	<i>Solidago hispida</i>	Red	Not Listed	Not Listed	Not Listed
White Snakeroot	<i>Ageratina altissima</i>	Red	Not Listed	Not Listed	Not Listed
Boreal Aster	<i>Symphyotrichum boreale</i>	Yellow	Not Listed	Not Listed	Not Listed
Wavy-leaved Aster	<i>Symphyotrichum undulatum</i>	Yellow	Not Listed	Not Listed	Not Listed
Fringed Blue Aster	<i>Symphyotrichum ciliolatum</i>	Yellow	Not Listed	Not Listed	Not Listed
Pale Jewelweed	<i>Impatiens pallida</i>	Yellow	Not Listed	Not Listed	Not Listed
Blue Cohosh	<i>Caulophyllum thalictroides</i>	Red	Not Listed	Not Listed	Not Listed
Smooth Alder	<i>Alnus serrulata</i>	Yellow	Not Listed	Not Listed	Not Listed
Newfoundland Dwarf Birch	<i>Betula michauxii</i>	Yellow	Not Listed	Not Listed	Not Listed
Wild Comfrey	<i>Cynoglossum virginianum</i>	Red	Not Listed	Not Listed	Not Listed
Drummond's Rockcress	<i>Arabis drummondii</i>	Yellow	Not Listed	Not Listed	Not Listed
Western Hairy Rockcress	<i>Arabis hirsuta</i>	Red	Not Listed	Not Listed	Not Listed
Small-flowered Bittercress	<i>Cardamine parviflora</i>	Yellow	Not Listed	Not Listed	Not Listed
Large Toothwort	<i>Cardamine maxima</i>	Red	Not Listed	Not Listed	Not Listed
Rock Whitlow-Grass	<i>Draba glabella</i>	Red	Not Listed	Not Listed	Not Listed
Marsh Bellflower	<i>Campanula aparinoides</i>	Yellow	Not Listed	Not Listed	Not Listed
Pale-Spiked Lobelia	<i>Lobelia spicata</i>	Red	Not Listed	Not Listed	Not Listed
Greenland Stitchwort	<i>Minuartia groenlandica</i>	Yellow	Not Listed	Not Listed	Not Listed
Sleepy Catchfly	<i>Silene antirrhina</i>	Red	Not Listed	Not Listed	Not Listed
Saltmarsh Starwort	<i>Stellaria humifusa</i>	Yellow	Not Listed	Not Listed	Not Listed
Long-leaved Starwort	<i>Stellaria longifolia</i>	Yellow	Not Listed	Not Listed	Not Listed
Roland's Sea-Blite	<i>Suaeda rolandii</i>	Red	Not Listed	Not Listed	Not Listed
Long-branched Frostweed	<i>Helianthemum canadense</i>	Red	Not Listed	Not Listed	Not Listed
Pinebarren Golden Heather	<i>Hudsonia ericoides</i>	Yellow	Not Listed	Not Listed	Not Listed
Coastal Sweet Pepperbush	<i>Clethra alnifolia</i>	Yellow	Special Concern	Special Concern	Vulnerable

Common Name	Scientific Name	NSDNR Status	COSEWIC Status	SARA Status	NSESA Status
Disguised St John's-wort	<i>Hypericum dissimulatum</i>	Yellow	Not Listed	Not Listed	Not Listed
Orange-fruited Tinker's Weed	<i>Triosteum aurantiacum</i>	Yellow	Not Listed	Not Listed	Not Listed
Water Pygmyweed	<i>Crassula aquatica</i>	Yellow	Not Listed	Not Listed	Not Listed
Buttonbush Dodder	<i>Cuscuta cephalanthi</i>	Red	Not Listed	Not Listed	Not Listed
Soapberry	<i>Shepherdia canadensis</i>	Yellow	Not Listed	Not Listed	Not Listed
Pink Crowberry	<i>Empetrum eamesii</i>	Yellow	Not Listed	Not Listed	Not Listed
Northern Blueberry	<i>Vaccinium boreale</i>	Red	Not Listed	Not Listed	Not Listed
Dwarf Bilberry	<i>Vaccinium caespitosum</i>	Yellow	Not Listed	Not Listed	Not Listed
Alpine Bilberry	<i>Vaccinium uliginosum</i>	Yellow	Not Listed	Not Listed	Not Listed
Robbins' Milkvetch	<i>Astragalus robbinsii</i>	Red	Not Listed	Not Listed	Not Listed
Canada Tick-trefoil	<i>Desmodium canadense</i>	Red	Not Listed	Not Listed	Not Listed
Large Tick-Trefoil	<i>Desmodium glutinosum</i>	Red	Not Listed	Not Listed	Not Listed
Field Locoweed	<i>Oxytropis campestris</i>	Red	Not Listed	Not Listed	Not Listed
Farwell's Water Milfoil	<i>Myriophyllum farwellii</i>	Yellow	Not Listed	Not Listed	Not Listed
Whorled Water Milfoil	<i>Myriophyllum verticillatum</i>	Yellow	Not Listed	Not Listed	Not Listed
Comb-leaved Mermaidweed	<i>Proserpinaca pectinata</i>	Yellow	Not Listed	Not Listed	Not Listed
Intermediate Mermaidweed	<i>Proserpinaca intermedia</i>	Red	Not Listed	Not Listed	Not Listed
American False Pennyroyal	<i>Hedeoma pulegioides</i>	Yellow	Not Listed	Not Listed	Not Listed
Canada Germander	<i>Teucrium canadense</i>	Yellow	Not Listed	Not Listed	Not Listed
False Mermaidweed	<i>Floerkea proserpinacoides</i>	Yellow	Not at Risk	Not Listed	Not Listed
Inverted Bladderwort	<i>Utricularia resupinata</i>	Red	Not Listed	Not Listed	Not Listed
Swamp Loosestrife	<i>Decodon verticillatus</i>	Yellow	Not Listed	Not Listed	Not Listed
Black Ash	<i>Fraxinus nigra</i>	Yellow	Not Listed	Not Listed	Not Listed
Red Ash	<i>Fraxinus pennsylvanica</i>	Red	Not Listed	Not Listed	Not Listed
Purple-veined Willowherb	<i>Epilobium coloratum</i>	Yellow	Not Listed	Not Listed	Not Listed
Downy Willowherb	<i>Epilobium strictum</i>	Yellow	Not Listed	Not Listed	Not Listed
American Cancer-root	<i>Conopholis americana</i>	Red	Not Listed	Not Listed	Not Listed
Blood Milkwort	<i>Polygala sanguinea</i>	Yellow	Not Listed	Not Listed	Not Listed
Halberd-leaved Tearthumb	<i>Persicaria arifolia</i>	Yellow	Not Listed	Not Listed	Not Listed
Climbing False Buckwheat	<i>Fallopia scandens</i>	Yellow	Not Listed	Not Listed	Not Listed
Triangular-valve Dock	<i>Rumex triangulivalvis</i>	Yellow	Not Listed	Not Listed	Not Listed
Horn-leaved Riverweed	<i>Podostemum ceratophyllum</i>	Red	Not Listed	Not Listed	Not Listed
Water Blinks	<i>Montia fontana</i>	Red	Not Listed	Not Listed	Not Listed
Mistassini Primrose	<i>Primula mistassinica</i>	Yellow	Not Listed	Not Listed	Not Listed
Seaside Brookweed	<i>Samolus valerandi</i>	Yellow	Not Listed	Not Listed	Not Listed
Lesser Pyrola	<i>Pyrola minor</i>	Yellow	Not Listed	Not Listed	Not Listed
Canada Anemone	<i>Anemone canadensis</i>	Red	Not Listed	Not Listed	Not Listed
Wood Anemone	<i>Anemone quinquefolia</i>	Yellow	Not Listed	Not Listed	Not Listed
Virginia Anemone	<i>Anemone virginiana</i>	Yellow	Not Listed	Not Listed	Not Listed
Round-lobed Hepatica	<i>Anemone americana</i>	Red	Not Listed	Not Listed	Not Listed
Cursed Buttercup	<i>Ranunculus sceleratus</i>	Red	Not Listed	Not Listed	Not Listed
Alder-leaved Buckthorn	<i>Rhamnus alnifolia</i>	Yellow	Not Listed	Not Listed	Not Listed
Nantucket Serviceberry	<i>Amelanchier nantucketensis</i>	Red	Not Listed	Not Listed	Not Listed

Common Name	Scientific Name	NSDNR Status	COSEWIC Status	SARA Status	NSESA Status
Common Buttonbush	<i>Cephalanthus occidentalis</i>	Yellow	Not Listed	Not Listed	Not Listed
Northern Bedstraw	<i>Galium boreale</i>	Red	Not Listed	Not Listed	Not Listed
Bog Willow	<i>Salix pedicellaris</i>	Yellow	Not Listed	Not Listed	Not Listed
Silky Willow	<i>Salix sericea</i>	Red	Not Listed	Not Listed	Not Listed
Northern Comandra	<i>Geocaulon lividum</i>	Yellow	Not Listed	Not Listed	Not Listed
White Mountain Saxifrage	<i>Saxifraga paniculata</i>	Yellow	Not Listed	Not Listed	Not Listed
Heart-leaved Foamflower	<i>Tiarella cordifolia</i>	Yellow	Not Listed	Not Listed	Not Listed
Clammy Hedge-Hyssop	<i>Gratiola neglecta</i>	Yellow	Not Listed	Not Listed	Not Listed
Southern Mudwort	<i>Limosella australis</i>	Yellow	Not Listed	Not Listed	Not Listed
Eastern Leatherwood	<i>Dirca palustris</i>	Red	Not Listed	Not Listed	Not Listed
Canada Wood Nettle	<i>Laportea canadensis</i>	Yellow	Not Listed	Not Listed	Not Listed
Dwarf Clearweed	<i>Pilea pumila</i>	Red	Not Listed	Not Listed	Not Listed
Northern Bog Violet	<i>Viola nephrophylla</i>	Yellow	Not Listed	Not Listed	Not Listed
Eastern White Cedar	<i>Thuja occidentalis</i>	Red	Not Listed	Not Listed	Vulnerable
Lesser Brown Sedge	<i>Carex adusta</i>	Yellow	Not Listed	Not Listed	Not Listed
Scabrous Black Sedge	<i>Carex atratiformis</i>	Yellow	Not Listed	Not Listed	Not Listed
Bebb's Sedge	<i>Carex bebbii</i>	Red	Not Listed	Not Listed	Not Listed
Hairlike Sedge	<i>Carex capillaris</i>	Yellow	Not Listed	Not Listed	Not Listed
Chestnut Sedge	<i>Carex castanea</i>	Red	Not Listed	Not Listed	Not Listed
Bearded Sedge	<i>Carex comosa</i>	Yellow	Not Listed	Not Listed	Not Listed
Bristle-leaved Sedge	<i>Carex eburnea</i>	Yellow	Not Listed	Not Listed	Not Listed
Garber's Sedge	<i>Carex garberi</i>	Red	Not Listed	Not Listed	Not Listed
Hayden's Sedge	<i>Carex haydenii</i>	Red	Not Listed	Not Listed	Not Listed
Pubescent Sedge	<i>Carex hirtifolia</i>	Yellow	Not Listed	Not Listed	Not Listed
Houghton's Sedge	<i>Carex houghtoniana</i>	Yellow	Not Listed	Not Listed	Not Listed
Porcupine Sedge	<i>Carex hystericina</i>	Red	Not Listed	Not Listed	Not Listed
Woolly Sedge	<i>Carex pellita</i>	Red	Not Listed	Not Listed	Not Listed
Loose-Flowered Sedge	<i>Carex laxiflora</i>	Red	Not Listed	Not Listed	Not Listed
Livid Sedge	<i>Carex livida</i>	Red	Not Listed	Not Listed	Not Listed
Peck's Sedge	<i>Carex peckii</i>	Red	Not Listed	Not Listed	Not Listed
Plantain-Leaved Sedge	<i>Carex plantaginea</i>	Red	Not Listed	Not Listed	Not Listed
Prairie Sedge	<i>Carex prairea</i>	Red	Not Listed	Not Listed	Not Listed
Swan's Sedge	<i>Carex swanii</i>	Yellow	Not Listed	Not Listed	Not Listed
Tender Sedge	<i>Carex tenera</i>	Yellow	Not Listed	Not Listed	Not Listed
Tuckerman's Sedge	<i>Carex tuckermanii</i>	Red	Not Listed	Not Listed	Not Listed
Yellow Spikerush	<i>Eleocharis flavescens</i>	Yellow	Not Listed	Not Listed	Not Listed
Ovate Spikerush	<i>Eleocharis ovata</i>	Yellow	Not Listed	Not Listed	Not Listed
Slender Cottongrass	<i>Eriophorum gracile</i>	Yellow	Not Listed	Not Listed	Not Listed
Long's Bulrush	<i>Scirpus longii</i>	Yellow	Special Concern	Special Concern	Vulnerable
Redroot	<i>Lachnanthes caroliana</i>	Red	Special Concern	Threatened	Threatened
Coastal Plain Blue-eyed-grass	<i>Sisyrinchium fuscatum</i>	Red	Not Listed	Not Listed	Not Listed
Sharp-fruited Rush	<i>Juncus acuminatus</i>	Yellow	Not Listed	Not Listed	Not Listed
Greene's Rush	<i>Juncus greenei</i>	Red	Not Listed	Not Listed	Not Listed
Grass-leaved Rush	<i>Juncus marginatus</i>	Yellow	Not Listed	Not Listed	Not Listed

Common Name	Scientific Name	NSDNR Status	COSEWIC Status	SARA Status	NSESA Status
One-sided Rush	<i>Juncus secundus</i>	Red	Not Listed	Not Listed	Not Listed
Woodland Rush	<i>Juncus subcaudatus</i>	Yellow	Not Listed	Not Listed	Not Listed
Dudley's Rush	<i>Juncus dudleyi</i>	Yellow	Not Listed	Not Listed	Not Listed
Wild Chives	<i>Allium schoenoprasum</i>	Red	Not Listed	Not Listed	Not Listed
Wild Leek	<i>Allium tricoccum</i>	Red	Not Listed	Not Listed	Not Listed
Canada Lily	<i>Lilium canadense</i>	Yellow	Not Listed	Not Listed	Not Listed
Golden Crest	<i>Lophiola aurea</i>	Red	Special Concern	Threatened	Threatened
Thread-Like Naiad	<i>Najas gracillima</i>	Red	Not Listed	Not Listed	Not Listed
Long-bracted Frog Orchid	<i>Coeloglossum viride</i>	Red	Not Listed	Not Listed	Not Listed
Ram's-Head Lady's-Slipper	<i>Cypripedium arietinum</i>	Red	Not Listed	Not Listed	Endangered
Yellow Lady's-slipper	<i>Cypripedium parviflorum</i>	Yellow	Not Listed	Not Listed	Not Listed
Showy Lady's-Slipper	<i>Cypripedium reginae</i>	Red	Not Listed	Not Listed	Not Listed
Downy Rattlesnake-Plantain	<i>Goodyera pubescens</i>	Red	Not Listed	Not Listed	Not Listed
Lesser Rattlesnake-plantain	<i>Goodyera repens</i>	Yellow	Not Listed	Not Listed	Not Listed
Southern Twayblade	<i>Listera australis</i>	Red	Not Listed	Not Listed	Not Listed
White Adder's-Mouth	<i>Malaxis monophyllos</i>	Red	Not Listed	Not Listed	Not Listed
Tuberclad Orchid	<i>Platanthera flava</i>	Yellow	Not Listed	Not Listed	Not Listed
Large Round-Leaved Orchid	<i>Platanthera macrophylla</i>	Yellow	Not Listed	Not Listed	Not Listed
Case's Ladies'-Tresses	<i>Spiranthes casei</i>	Yellow	Not Listed	Not Listed	Not Listed
Shining Ladies'-Tresses	<i>Spiranthes lucida</i>	Red	Not Listed	Not Listed	Not Listed
Yellow Ladies'-tresses	<i>Spiranthes ochroleuca</i>	Yellow	Not Listed	Not Listed	Not Listed
Short-awned Foxtail	<i>Alopecurus aequalis</i>	Yellow	Not Listed	Not Listed	Not Listed
Slim-stemmed Reed Grass	<i>Calamagrostis stricta</i>	Yellow	Not Listed	Not Listed	Not Listed
Narrow-leaved Panic Grass	<i>Dichanthelium linearifolium</i>	Yellow	Not Listed	Not Listed	Not Listed
Slender Panic Grass	<i>Dichanthelium xanthophysum</i>	Red	Not Listed	Not Listed	Not Listed
Wiegand's Wild Rye	<i>Elymus wiegandii</i>	Red	Not Listed	Not Listed	Not Listed
Spreading Wild Rye	<i>Elymus hystrix</i>	Red	Not Listed	Not Listed	Not Listed
Nodding Fescue	<i>Festuca subverticillata</i>	Red	Not Listed	Not Listed	Not Listed
Canada Rice Grass	<i>Piptatherum canadense</i>	Yellow	Not Listed	Not Listed	Not Listed
Tuckerman's Panic Grass	<i>Panicum tuckermanii</i>	Yellow	Not Listed	Not Listed	Not Listed
Redtop Panic Grass	<i>Panicum rigidulum</i>	Yellow	Not Listed	Not Listed	Not Listed
Glaucous Blue Grass	<i>Poa glauca</i>	Yellow	Not Listed	Not Listed	Not Listed
Slender Rice Grass	<i>Piptatherum pungens</i>	Yellow	Not Listed	Not Listed	Not Listed
Fries' Pondweed	<i>Potamogeton friesii</i>	Red	Not Listed	Not Listed	Not Listed
White-stemmed Pondweed	<i>Potamogeton praelongus</i>	Yellow	Not Listed	Not Listed	Not Listed
Richardson's Pondweed	<i>Potamogeton richardsonii</i>	Red	Not Listed	Not Listed	Not Listed
Flat-stemmed Pondweed	<i>Potamogeton zosteriformis</i>	Yellow	Not Listed	Not Listed	Not Listed
Northern Maidenhair Fern	<i>Adiantum pedatum</i>	Red	Not Listed	Not Listed	Not Listed
Steller's Rockbrake	<i>Cryptogramma stelleri</i>	Red	Not Listed	Not Listed	Not Listed
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>	Yellow	Not Listed	Not Listed	Not Listed
Green Spleenwort	<i>Asplenium viride</i>	Yellow	Not Listed	Not Listed	Not Listed
Fragrant Wood Fern	<i>Dryopteris fragrans</i>	Yellow	Not Listed	Not Listed	Not Listed

Common Name	Scientific Name	NSDNR Status	COSEWIC Status	SARA Status	NSESA Status
Smooth Cliff Fern	<i>Woodsia glabella</i>	Yellow	Not Listed	Not Listed	Not Listed
Marsh Horsetail	<i>Equisetum palustre</i>	Red	Not Listed	Not Listed	Not Listed
Meadow Horsetail	<i>Equisetum pratense</i>	Yellow	Not Listed	Not Listed	Not Listed
Acadian Quillwort	<i>Isoetes acadiensis</i>	Yellow	Not Listed	Not Listed	Not Listed
Prototype Quillwort	<i>Isoetes prototypus</i>	Yellow	Special Concern	Special Concern	Vulnerable
Triangle Moonwort	<i>Botrychium lanceolatum</i>	Yellow	Not Listed	Not Listed	Not Listed
Common Moonwort	<i>Botrychium lunaria</i>	Red	Not Listed	Not Listed	Not Listed
Least Moonwort	<i>Botrychium simplex</i>	Yellow	Not Listed	Not Listed	Not Listed
Northern Adder's-tongue	<i>Ophioglossum pusillum</i>	Yellow	Not Listed	Not Listed	Not Listed
<b>Lichens</b>					
Ghost Antler Lichen	<i>Pseudevernia cladonia</i>	Yellow	Not at Risk	No Status	Not Listed
Boreal Felt Lichen (Atlantic pop.)	<i>Erioderma pedicellatum</i>	Red	Endangered	Endangered	Endangered

Scientific Name	Common Name	NSDNR Status	COSEWIC Status	SARA Status	NSESA Status
<i>Abies balsamea</i>	Balsam Fir	Green	Not Listed	Not Listed	Not Listed
<i>Acer rubrum</i>	Red Maple	Green	Not Listed	Not Listed	Not Listed
<i>Acer spicatum</i>	Mountain Maple	Green	Not Listed	Not Listed	Not Listed
<i>Achillea millefolium</i>	Common Yarrow	Green	Not Listed	Not Listed	Not Listed
<i>Alnus incana</i>	Speckled Alder	Green	Not Listed	Not Listed	Not Listed
<i>Alnus viridis</i>	Green Alder	Green	Not Listed	Not Listed	Not Listed
<i>Amelanchier sp.</i>	Serviceberry	N/A	N/A	N/A	N/A
<i>Anaphalis margaritacea</i>	Pearly Everlasting	Green	Not Listed	Not Listed	Not Listed
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	Green	Not Listed	Not Listed	Not Listed
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	Green	Not Listed	Not Listed	Not Listed
<i>Arctostaphylos uva-ursi</i>	Bearberry	Green	Not Listed	Not Listed	Not Listed
<i>Betula alleghaniensis</i>	Yellow Birch	Green	Not Listed	Not Listed	Not Listed
<i>Betula papyrifera</i>	Paper Birch	Green	Not Listed	Not Listed	Not Listed
<i>Betula populifolia</i>	Gray Birch	Green	Not Listed	Not Listed	Not Listed
<i>Bidens frondosa</i>	Devil's Beggar-Ticks	Green	Not Listed	Not Listed	Not Listed
<i>Brachyelytrum septentrionale</i>	Bearded Short-Husk	Green	Not Listed	Not Listed	Not Listed
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	Green	Not Listed	Not Listed	Not Listed
<i>Calopogon tuberosus</i>	Tuberous Grass-Pink	Green	Not Listed	Not Listed	Not Listed
<i>Carex crinita</i>	Fringed Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Carex debilis</i>	White-Edge Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Carex echinata</i>	Little Prickly Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Carex folliculata</i>	Long Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Carex leptalea</i>	Bristly-Stalk Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Carex limosa</i>	Mud Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Carex lurida</i>	Shallow Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Carex magellanica (= C. paupercula)</i>	A Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Carex scoparia</i>	Pointed Broom Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Carex stricta</i>	Tussock Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Carex trisperma</i>	Three-Seed Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Centaurea nigra</i>	Black Starthistle	Exotic	Not Listed	Not Listed	Not Listed
<i>Chamaedaphne calyculata</i>	Leatherleaf	Green	Not Listed	Not Listed	Not Listed
<i>Chelone glabra</i>	White Turtlehead	Green	Not Listed	Not Listed	Not Listed
<i>Clintonia borealis</i>	Clinton Lily	Green	Not Listed	Not Listed	Not Listed
<i>Comptonia peregrina</i>	Sweet Fern	Green	Not Listed	Not Listed	Not Listed
<i>Coptis trifolia</i>	Goldthread	Green	Not Listed	Not Listed	Not Listed
<i>Cornus canadensis</i>	Dwarf Dogwood	Green	Not Listed	Not Listed	Not Listed
<i>Coronilla varia</i>	Common Crown-Vetch	Exotic	Not Listed	Not Listed	Not Listed
<i>Cypripedium acaule</i>	Pink Lady's-Slipper	Green	Not Listed	Not Listed	Not Listed
<i>Danthonia compressa</i>	Flattened Oatgrass	Green	Not Listed	Not Listed	Not Listed
<i>Danthonia spicata</i>	Poverty Oat-Grass	Green	Not Listed	Not Listed	Not Listed
<i>Daucus carota</i>	Wild Carrot	Exotic	Not Listed	Not Listed	Not Listed
<i>Dennstaedtia punctilobula</i>	Eastern Hay-Scented Fern	Green	Not Listed	Not Listed	Not Listed
<i>Dianthus armeria</i>	Deptford-Pink	Exotic	Not Listed	Not Listed	Not Listed
<i>Diervilla lonicera</i>	Northern Bush-Honeysuckle	Green	Not Listed	Not Listed	Not Listed
<i>Doellingeria umbellata</i>	Parasol White-Top	Green	Not Listed	Not Listed	Not Listed
<i>Drosera rotundifolia</i>	Roundleaf Sundew	Green	Not Listed	Not Listed	Not Listed
<i>Dryopteris intermedia</i>	EverGreen Woodfern	Green	Not Listed	Not Listed	Not Listed
<i>Dulichium arundinaceum</i>	Three-Way Sedge	Green	Not Listed	Not Listed	Not Listed
<i>Eleocharis obtusa</i>	Blunt Spike-Rush	Green	Not Listed	Not Listed	Not Listed
<i>Empetrum nigrum</i>	Black Crowberry	Green	Not Listed	Not Listed	Not Listed
<i>Epigaea repens</i>	Trailing Arbutus	Green	Not Listed	Not Listed	Not Listed
<i>Epilobium ciliatum</i>	Hairy Willow-Herb	Green	Not Listed	Not Listed	Not Listed
<i>Epipactis helleborine</i>	Eastern Helleborine	Exotic	Not Listed	Not Listed	Not Listed
<i>Equisetum arvense</i>	Field Horsetail	Green	Not Listed	Not Listed	Not Listed
<i>Equisetum sylvaticum</i>	Woodland Horsetail	Green	Not Listed	Not Listed	Not Listed
<i>Erechtites hieraciifolius</i>	Fireweed	Green	Not Listed	Not Listed	Not Listed
<i>Erigeron strigosus</i>	Daisy Fleabane	Green	Not Listed	Not Listed	Not Listed
<i>Eriophorum virginicum</i>	Tawny Cotton-Grass	Green	Not Listed	Not Listed	Not Listed
<i>Eupatorium perfoliatum</i>	Common Boneset	Green	Not Listed	Not Listed	Not Listed
<i>Euphrasia stricta</i>	Drug Eyebright	Exotic	Not Listed	Not Listed	Not Listed
<i>Eurybia radula</i>	Rough-Leaved Aster	Green	Not Listed	Not Listed	Not Listed
<i>Euthamia graminifolia</i>	Flat-Top Fragrant-Golden-Rod	Green	Not Listed	Not Listed	Not Listed
<i>Festuca rubra</i>	Red Fescue	Green	Not Listed	Not Listed	Not Listed
<i>Fragaria virginiana</i>	Virginia Strawberry	Green	Not Listed	Not Listed	Not Listed
<i>Fraxinus americana</i>	White Ash	Green	Not Listed	Not Listed	Not Listed
<i>Gaultheria hispida</i>	Creeping Snowberry	Green	Not Listed	Not Listed	Not Listed
<i>Gaultheria procumbens</i>	Teaberry	Green	Not Listed	Not Listed	Not Listed
<i>Gaylussacia baccata</i>	Black Huckleberry	Green	Not Listed	Not Listed	Not Listed
<i>Glyceria borealis</i>	Small Floating Manna-Grass	Green	Not Listed	Not Listed	Not Listed
<i>Glyceria canadensis</i>	Canada Manna-Grass	Green	Not Listed	Not Listed	Not Listed
<i>Glyceria striata</i>	Fowl Manna-Grass	Green	Not Listed	Not Listed	Not Listed
<i>Gymnocarpium dryopteris</i>	Northern Oak Fern	Green	Not Listed	Not Listed	Not Listed
<i>Hamamelis virginiana</i>	American Witch-Hazel	Green	Not Listed	Not Listed	Not Listed
<i>Hieracium canadense</i>	Canada Hawkweed	Green	Not Listed	Not Listed	Not Listed
<i>Hieracium pilosella</i>	Mouseear	Exotic	Not Listed	Not Listed	Not Listed

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<i>Hieracium piloselloides</i>	Tall Hawkweed	Exotic	Not Listed	Not Listed	Not Listed
<i>Hieracium scabrum</i>	Rough Hawkweed	Green	Not Listed	Not Listed	Not Listed
<i>Houstonia (Hedyotis) caerulea</i>	Common Bluets	Green	Not Listed	Not Listed	Not Listed
<i>Hydrocotyle americana</i>	American Water-Pennywort	Green	Not Listed	Not Listed	Not Listed
<i>Hypericum boreale</i>	Northern St. John's-Wort	Green	Not Listed	Not Listed	Not Listed
<i>Hypericum perforatum</i>	A St. John's-Wort	Exotic	Not Listed	Not Listed	Not Listed
<i>Ilex verticillata</i>	Black Holly	Green	Not Listed	Not Listed	Not Listed
<i>Juncus canadensis</i>	Canada Rush	Green	Not Listed	Not Listed	Not Listed
<i>Juncus effusus</i>	Soft Rush	Green	Not Listed	Not Listed	Not Listed
<i>Juncus tenuis</i>	Slender Rush	Green	Not Listed	Not Listed	Not Listed
<i>Juniperus communis</i>	Ground Juniper	Green	Not Listed	Not Listed	Not Listed
<i>Kalmia angustifolia</i>	Sheep-Laurel	Green	Not Listed	Not Listed	Not Listed
<i>Kalmia polifolia</i>	Pale Laurel	Green	Not Listed	Not Listed	Not Listed
<i>Larix laricina</i>	American Larch	Green	Not Listed	Not Listed	Not Listed
<i>Ledum groenlandicum</i>	Common Labrador Tea	Green	Not Listed	Not Listed	Not Listed
<i>Leucanthemum vulgare</i>	Oxeye Daisy	Exotic	Not Listed	Not Listed	Not Listed
<i>Linnaea borealis</i>	Twinflower	Green	Not Listed	Not Listed	Not Listed
<i>Lonicera villosa</i>	Mountain Fly-Honeysuckle	Green	Not Listed	Not Listed	Not Listed
<i>Lotus corniculatus</i>	Birds-Foot Trefoil	Exotic	Not Listed	Not Listed	Not Listed
<i>Lycopodium annotinum</i>	Stiff Clubmoss	Green	Not Listed	Not Listed	Not Listed
<i>Lycopodium clavatum</i>	Running Pine	Green	Not Listed	Not Listed	Not Listed
<i>Lycopodium dendroideum</i>	Treelike Clubmoss	Green	Not Listed	Not Listed	Not Listed
<i>Lycopus americanus</i>	American Bugleweed	Green	Not Listed	Not Listed	Not Listed
<i>Lycopus uniflorus</i>	Northern Bugleweed	Green	Not Listed	Not Listed	Not Listed
<i>Lysimachia terrestris</i>	Swamp Loosestrife	Green	Not Listed	Not Listed	Not Listed
<i>Maianthemum canadense</i>	Wild Lily-of-The-Valley	Green	Not Listed	Not Listed	Not Listed
<i>Medeola virginiana</i>	Indian Cucumber-Root	Green	Not Listed	Not Listed	Not Listed
<i>Melilotus officinalis</i>	Yellow Sweetclover	Exotic	Not Listed	Not Listed	Not Listed
<i>Mimulus ringens</i>	Square-Stem Monkeyflower	Green	Not Listed	Not Listed	Not Listed
<i>Mitchella repens</i>	Partridge-Berry	Green	Not Listed	Not Listed	Not Listed
<i>Monotropa hypopithys</i>	American Pinesap	Green	Not Listed	Not Listed	Not Listed
<i>Monotropa uniflora</i>	Indian-Pipe	Green	Not Listed	Not Listed	Not Listed
<i>Nemopanthus mucronatus</i>	Mountain Holly	Green	Not Listed	Not Listed	Not Listed
<i>Oclemena acuminata</i>	Whorled Aster	Green	Not Listed	Not Listed	Not Listed
<i>Oclemena nemoralis</i>	Bog Aster	Green	Not Listed	Not Listed	Not Listed
<i>Oenothera biennis</i>	Common Evening-Primrose	Green	Not Listed	Not Listed	Not Listed
<i>Onoclea sensibilis</i>	Sensitive Fern	Green	Not Listed	Not Listed	Not Listed
<i>Osmunda cinnamomea</i>	Cinnamon Fern	Green	Not Listed	Not Listed	Not Listed
<i>Osmunda claytoniana</i>	Interrupted Fern	Green	Not Listed	Not Listed	Not Listed
<i>Osmunda regalis</i>	Royal Fern	Green	Not Listed	Not Listed	Not Listed
<i>Oxalis montana</i>	White Wood-Sorrel	Green	Not Listed	Not Listed	Not Listed
<i>Oxalis stricta</i>	Upright Yellow Wood-Sorrel	Green	Not Listed	Not Listed	Not Listed
<i>Petasites frigidus</i>	Sweet Coltsfoot	Green	Not Listed	Not Listed	Not Listed
<i>Phegopteris connectilis</i>	Northern Beech Fern	Green	Not Listed	Not Listed	Not Listed
<i>Photinia (= Aronia) melanocarpa</i>	Black Chokeberry	Green	Not Listed	Not Listed	Not Listed
<i>Picea glauca</i>	White Spruce	Green	Not Listed	Not Listed	Not Listed
<i>Picea mariana</i>	Black Spruce	Green	Not Listed	Not Listed	Not Listed
<i>Picea rubens</i>	Red Spruce	Green	Not Listed	Not Listed	Not Listed
<i>Pinus strobus</i>	Eastern White Pine	Green	Not Listed	Not Listed	Not Listed
<i>Platanthera clavellata</i>	Small Green Woodland Orchid	Green	Not Listed	Not Listed	Not Listed
<i>Pogonia ophioglossoides</i>	Rose Pogonia	Green	Not Listed	Not Listed	Not Listed
<i>Polygonum (Fallopia) convolvulus</i>	Black Bindweed	Exotic	Not Listed	Not Listed	Not Listed
<i>Polypodium virginianum</i>	Rock Polypody	Green	Not Listed	Not Listed	Not Listed
<i>Polystichum acrostichoides</i>	Christmas Fern	Green	Not Listed	Not Listed	Not Listed
<i>Populus balsamifera</i>	Balsam Poplar	Green	Not Listed	Not Listed	Not Listed
<i>Populus grandidentata</i>	Large-Tooth Aspen	Green	Not Listed	Not Listed	Not Listed
<i>Populus tremuloides</i>	Quaking Aspen	Green	Not Listed	Not Listed	Not Listed
<i>Potentilla recta</i>	Sulphur Cinquefoil	Exotic	Not Listed	Not Listed	Not Listed
<i>Potentilla simplex</i>	Old-Field Cinquefoil	Green	Not Listed	Not Listed	Not Listed
<i>Prenanthes trifoliolata</i>	Three-Leaved Rattlesnake-root	Green	Not Listed	Not Listed	Not Listed
<i>Prunella vulgaris</i>	Self-Heal	Green	Not Listed	Not Listed	Not Listed
<i>Prunus pennsylvanica</i>	Fire Cherry	Green	Not Listed	Not Listed	Not Listed
<i>Pteridium aquilinum</i>	Bracken Fern	Green	Not Listed	Not Listed	Not Listed
<i>Rhododendron canadense</i>	Rhodora	Green	Not Listed	Not Listed	Not Listed
<i>Rosa virginiana</i>	Virginia Rose	Green	Not Listed	Not Listed	Not Listed
<i>Rubus allegheniensis</i>	Allegheny Blackberry	Green	Not Listed	Not Listed	Not Listed
<i>Rubus hispida</i>	Bristly Dewberry	Green	Not Listed	Not Listed	Not Listed
<i>Rubus idaeus</i>	Red Raspberry	Green	Not Listed	Not Listed	Not Listed
<i>Rubus pubescens</i>	Dwarf Red Raspberry	Green	Not Listed	Not Listed	Not Listed
<i>Salix discolor</i>	Pussy Willow	Green	Not Listed	Not Listed	Not Listed
<i>Salix eriocephala</i>	Heart-Leaved Willow	Green	Not Listed	Not Listed	Not Listed
<i>Sambucus racemosa</i>	Red Elderberry	Green	Not Listed	Not Listed	Not Listed
<i>Sarracenia purpurea</i>	Northern Pitcher-Plant	Green	Not Listed	Not Listed	Not Listed
<i>Scirpus cyperinus</i>	Cottongrass Bulrush	Green	Not Listed	Not Listed	Not Listed
<i>Scirpus microcarpus</i>	Small-Fruit Bulrush	Green	Not Listed	Not Listed	Not Listed



Scientific Name	Common Name	NSDNR Status	COSEWIC Status	SARA Status	NSESA Status
<i>Scutellaria galericulata</i>	Hooded Skullcap	Green	Not Listed	Not Listed	Not Listed
<i>Solidago puberula</i>	Downy Goldenrod	Green	Not Listed	Not Listed	Not Listed
<i>Solidago rugosa</i>	Rough-Leaf Goldenrod	Green	Not Listed	Not Listed	Not Listed
<i>Solidago uliginosa</i>	Bog Goldenrod	Green	Not Listed	Not Listed	Not Listed
<i>Sorbus americana</i>	American Mountain-Ash	Green	Not Listed	Not Listed	Not Listed
<i>Sorbus aucuparia</i>	European Mountain-Ash	Exotic	Not Listed	Not Listed	Not Listed
<i>Sparganium americanum</i>	American Bur-Reed	Green	Not Listed	Not Listed	Not Listed
<i>Spiraea alba</i>	Narrow-Leaved Meadow-Sweet	Green	Not Listed	Not Listed	Not Listed
<i>Spiraea tomentosa</i>	Hardhack Spiraea	Green	Not Listed	Not Listed	Not Listed
<i>Spiranthes cernua</i>	Nodding Ladies'-Tresses	Green	Not Listed	Not Listed	Not Listed
<i>Symphyotrichum lateriflorum</i>	Farewell-Summer	Green	Not Listed	Not Listed	Not Listed
<i>Symphyotrichum novi-belgii</i>	New Belgium American-Aster	Green	Not Listed	Not Listed	Not Listed
<i>Thelypteris noveboracensis</i>	New York Fern	Green	Not Listed	Not Listed	Not Listed
<i>Triadenum virginicum</i>	Marsh St. John's Wort	Green	Not Listed	Not Listed	Not Listed
<i>Trientalis borealis</i>	Northern Starflower	Green	Not Listed	Not Listed	Not Listed
<i>Trifolium arvense</i>	Rabbit-Foot Clover	Exotic	Not Listed	Not Listed	Not Listed
<i>Trifolium aureum</i>	Yellow Clover	Exotic	Not Listed	Not Listed	Not Listed
<i>Trillium undulatum</i>	Painted Trillium	Green	Not Listed	Not Listed	Not Listed
<i>Tsuga canadensis</i>	Eastern Hemlock	Green	Not Listed	Not Listed	Not Listed
<i>Tussilago farfara</i>	Colt's Foot	Exotic	Not Listed	Not Listed	Not Listed
<i>Typha latifolia</i>	Broad-Leaf Cattail	Green	Not Listed	Not Listed	Not Listed
<i>Vaccinium angustifolium</i>	Late Lowbush Blueberry	Green	Not Listed	Not Listed	Not Listed
<i>Vaccinium macrocarpon</i>	Large Cranberry	Green	Not Listed	Not Listed	Not Listed
<i>Vaccinium myrtilloides</i>	Velvetleaf Blueberry	Green	Not Listed	Not Listed	Not Listed
<i>Vaccinium oxycoccos</i>	Small Cranberry	Green	Not Listed	Not Listed	Not Listed
<i>Veronica officinalis</i>	Gypsy-Weed	Exotic	Not Listed	Not Listed	Not Listed
<i>Viburnum nudum</i>	Poosum-Haw Viburnum	Green	Not Listed	Not Listed	Not Listed
<i>Viola sp.</i>	violets	N/A	N/A	N/A	N/A