APPENDIX A
THE MUNICIPALITY OF THE COUNTY OF COLCHESTER
LAND USE BY LAW

Municipality of Colchester

Chapter 56
Wind Turbine Development Bylaw

1. Title & Scope:

1.1 This Bylaw is enacted pursuant to Section 172 of the Municipal Government Act, SNS 1998, c.18 and shall be known and may be cited as the "Wind Turbine Development Bylaw" of the Municipality of Colchester and shall apply to all lands within the Municipality of the County of Colchester.

1.2 This Bylaw does not exempt any person from complying with the requirements of other bylaws or regulations in force within the Municipality of the County of Colchester and from obtaining any licence, permission, permit, authority or approval as otherwise required by the Municipality, the Province of Nova Scotia, and/or the Government of Canada.

1.3 This by-law shall apply to all large and small scale wind turbines including those existing prior to the effective date of this by-law, except Section 4 which shall not apply so as to invalidate the location of any wind turbine pre-existing the effective date of this by-law. This Bylaw shall not apply to micro-scale wind turbines.

2. Definitions:

For the purposes of this Bylaw:

2.1 **"Decommissioning"** means the final closing down and dismantling of a wind turbine and associated infrastructure once the project has reached the end of its operation life;

2.2 **"Development Officer"** means the Development Officer appointed by the Council of the Municipality of the County of Colchester;

2.3 **"Dwelling"** means all structures intended for regular human occupation, such as a house or cottage but not a camp or an accessory structure such as a shed or storage area;

2.4 **"Camp"** means a recreational shelter typically used for weekend or short term activities such as hunting, fishing or snowmobiling. Camps are more rustic than cottages and usually lack some of the basic facilities such as running water, electricity, and separate kitchen;

2.5 **"Cottage"** means a seasonal home that is serviced with running water, onsite sewage disposal system and electricity and that is equipped to accommodate an

extended period of stay. Cottages are able to evolve into retirement or permanent homes;

2.6 **"Environmental Assessment"** means all documentation required under the *Canadian Environmental Assessment Act* and *Nova Scotia Environment Act* and regulations;

2.7 **"Licence"** means a Wind Turbine Development Licence issued pursuant to this Bylaw;

2.8 **"Nacelle"** means the frame and housing at the top of the tower that is part of a wind turbine enclosing components such as, the gearbox and generator, protecting them from the weather;

2.9 **"Nameplate Capacity"** means the manufacturer's maximum rated output of the wind turbine expressed in kilowatts;

2.10 **"Municipality"** means the Municipality of the County of Colchester;

2.11 **"Owner"**and**"Operator"**mean respectively any Owner or Operator of a wind turbine licensed under this Bylaw;

2.12 **"Setback"** means the measured distance from the base of the wind turbine tower;

2.13 **"Wind Farm"** means two or more large scale wind turbines electrically connected to the transmission grid or local distribution network;

2.14 **"Wind Power Project"** means a Wind Farm or Wind Turbine and associated property, substations and other utility systems;

2.15 **"Wind Turbine"** means a wind energy conversion system erected to produce electrical power by capturing the kinetic energy in wind and converting it into electricity;

2.16 **"Wind Turbine Height"** means the distance measured from grade to the highest point of the blade's arc;

2.17 **"Wind Turbine - Large Scale"** means any Wind Turbine, which has a Nameplate Capacity of greater than 100kW, which may be developed as a stand alone turbine or in combination with other turbines in a Wind Farm;

2.18 **"Wind Turbine - Small Scale"** means a Wind Turbine which has a Nameplate Capacity of equal to or less than 100kW, but not less than 1kW, which may be developed as a stand alone turbine or in combination with other turbines in a wind farm;

2.19 **"Wind Turbine - Micro Scale"** means a Wind Turbine which has a Nameplate Capacity of equal to or less than 1kW.

3. Administration:

3.1 No person shall install or operate a Wind Turbine in the Municipality of the County of Colchester without first having obtained a Licence from the Development Officer.

3.2 A Licence for a Wind Turbine shall be issued by the Development Officer subject to the following requirements:

a) The Owner or Operator submits a completed application in such form as is approved from time to time by the Municipality;
b) The application shall be cosigned by the registered property owner if the land is not owned by the Owner and/or Operator of the Wind Turbine;
c) A completed application form is accompanied with an application fee in an amount that is to be determined by Municipal Council from time to time;
d) The requirements contained in Section 4 and Section 5 and 6 of this Bylaw have been met.

3.3 Duration of Licence:

a) A Licence issued under this Bylaw will be in effect for 25 years unless otherwise cancelled or suspended.

b) An Owner or Operator may apply to renew a Licence and a completed application must be submitted to the Development Officer no less than thirty days prior to the expiry date of the effective Licence. An application for renewal will be accompanied with an application fee that is set by Municipal Council from time to time. A License shall be renewed for a period of 20 years provided the application includes information, prepared by a qualified individual, that demonstrates the Wind Turbine(s) can safely operate for the additional time period.

c) A Licence issued under this Bylaw shall automatically lapse and become null and void if, in the opinion of the Development Officer:

(*i*) construction of the Wind Power Project has not commenced within eighteen (18) months of the date the Licence was issued;

(*ii*) substantial completion of the Wind Power Project has not occurred within five (5) years of the date that the Licence was issued;

(*iii)* following the issuance of a Licence, new or corrected information that materially affects the application is brought to the attention of the Development Officer;

(iv) the applicant fails to meet the requirements of Section 7 of this Bylaw; or

(v) the entire Wind Power Project has ceased operation for a period of at least one year, unless the Owner or Operator thereof can reasonably establish that additional time is needed to repair or rebuild part or all of the Wind Power Project because of damage or loss caused by circumstances beyond the reasonable control of the Owner or Operator.

3.4 Notice of Decision:

a) Within a reasonable amount of time, not to exceed 45 days, of receiving a completed application for a Licence or renewal thereof, the Development Officer shall either issue the Licence or notify the applicant of a decision to refuse the issuance:

b) A decision to refuse an application for a Licence or Renewal thereof shall be served to the applicant in writing by ordinary mail and shall include the reasons for not issuing or renewing the License.

4. Location Conditions:

A Wind Power Project shall meet the following conditions:

a) The minimum Setback for a Large Scale Wind Turbine from an external property line and public roads will be one (1) times the total height of the Wind Turbine. This Setback will not apply where the adjoining property is part of the Wind Power Project.

b) The minimum Setback for the location of a Large Scale Wind Turbine from an existing dwelling, such as a house or cottage but not a camp, on a neighbouring property is 700 metres.

c) The applicant may request a reduction of the 700m setback down to a minimum of 500m with written permission from the neighbouring property owner. Written permission will be obtained from the neighbouring property owner in a fashion approved by the Municipality.

d) The minimum Setback from an external property line for a Small Scale Wind Turbine shall be two (2) times the total height of the Wind Turbine. This Setback will not apply where the adjoining property is part of the Wind Power Project.

5 Conditions of Operation

5.1 Finish

A Wind Turbine shall have a non-reflective matte finish in an unobtrusive colour.

5.2 Lettering and Signage

A Wind Turbine tower shall not contain any commercial advertising. However, the hub or Nacelle may display the manufacturer's, Operator's or Owner's name

or logo. Site signs will be limited to those which identify the Wind Power Project, locate access points and provide safety and educational information.

5.3 Tower Access and Safety

a) A wind power project shall be protected from unauthorized access by a security fence, with a lockable gate and a minimum height of 1.8 metres, or by having any ladder or permanent tower access located no closer to the ground than 3.7metres or for monopole designs, with internal access only, a lockable door.

b) The minimum rotor blade ground clearance will be 7.5 metres.

5.4 Lighting

A Wind Turbine shall not be provided with artificial lighting except for lighting that is required by Transportation Canada or other regulatory authorities.

5.5 Temporary Uses - test towers

Facilities for the assessment of wind energy resources (test towers) may be erected for the life of the wind power project if they continue to be used. If they are no longer required as part of the project, they shall be removed within one year of inactivity.

5.6 Outdoor Storage

Outdoor storage shall be considered an accessory use to a wind power project and any such storage occurring after the completion of construction activities of the wind power project shall be screened from view from adjacent residential Dwellings and public highways.

6. Information Required at Time of Application

Along with the application for a Licence, the applicant shall provide:

a) A site plan, drawn to scale by an engineer or surveyor, showing the location of the Wind Turbines and accessory components of the Wind Power Project;

b) A plan, drawn to scale, showing location of adjacent structures and identifying all Dwellings and public roads within 1 kilometres of any proposed Large Scale Wind Turbines;

c) A copy of the Environmental Assessment, if applicable. The notice of federal and/or provincial approvals, along with any changes, comments or conditions will be forwarded to the Municipality upon issuance;

e) The recognised design standard for the proposed turbines;

f) A copy of a Decommissioning Plan as prepared by the applicant. The Decommissioning Plan will identify above ground components of the Wind Power Project to be removed from the site along with any site remediation, excluding roads, required to return the site to a natural state. Decommissioning will

commence within one (1) year after the owner or operator has surrendered the License or the License has been terminated by force of Section 3.3 of this Bylaw. Decommissioning shall be completed within twelve (12) months after its commencement;

g) A copy of approvals from Transportation Canada and Navigation Canada and/or such other regulatory approval that may be required; and

h) Evidence and results of public notification to Section 8 of this Bylaw.

7. Requirements of the Applicant During the Construction Phase

It shall be a condition of a Licence, issued under this Bylaw, that:

a) once determined, the applicant shall submit the engineer drawings for the foundations supporting the Wind Turbines as prepared and stamped by a professional engineer, licensed to practice in Nova Scotia;

b) within two (2) months of installation of a single Wind Turbine (or completion of a phase in a multi-phased wind turbine project), the applicant will submit a location certificate for each foundation, that confirms that the location of each such Wind Turbine is in compliance with the applicable Setbacks stipulated in this Bylaw;

c) when an Environmental Assessment is required, under Section 6c, above, construction will not commence until the final approvals of the Environmental Assessment are issued and submitted to the Administrator of this Bylaw.

8. Community Information Meeting

8.1 As part of the application for Large Scale Wind Turbine Project Licence, the applicant shall arrange or have conducted a community meeting, in the community where the Wind Power Project is to be located, to present the proposal and answer any questions concerning the project.

8.2 Notice of Meeting

The applicant will provide sufficient notice to enable municipal councillors and staff to attend the meeting. Notice of meeting will be advertised in the local and daily newspaper a minimum of two times, first notice being two weeks prior to the meeting date. At the time of first notice, the applicant will advise the Municipality of the meeting date, time and location.

8.3 Citizen Monitoring Committee

The applicant shall offer opportunity to the community to establish a citizen monitoring committee for the duration of the construction phase of the project.

9. Enforcement

9.1 Right of Inspection

The Development Officer and any employee of the Municipality authorized by the Development Officer may, for the purpose of ensuring compliance with this By-law, including compliance with the Decommissioning Plan enter in or upon any land or premises at any reasonable time upon reasonable notice thereof but without a warrant. If a person refuses to allow the administrator to exercise, or attempts to interfere or interferes with the administrator in the exercise of a power pursuant to this Act, the administrator may apply to a judge of the Supreme Court of Nova Scotia for an order to allow the administrator entry to the property and an order restraining a person from further interference.

9.2 Offence

It shall be an offence to:

a) contravene any provision of this Bylaw, including any licensing requirement, location condition or condition of operation and construction;

b) contravene any condition in a Wind Turbine Development Licence, or renewal thereof under this bylaw; and

c) fail to comply with any representations contained within an application in respect of which a Licence has been issued.

9.3 Punishment

Offences pursuant to subsection 9.2 are punishable on summary conviction by a fine of not less than $1,000 and not more than $5,000 and to imprisonment of not more than two months in default of payment thereof.

9.4 Additional Penalty

In addition to any penalty under subsection 9.3, in the event of an offence against this Bylaw, the Development Officer may suspend a Licence for a period of up to 3 months in respect of a first conviction and may revoke a Licence in respect of a second conviction within any 3 year period.

A suspension or revocation shall preclude any person from applying for or being granted Licence or renewal for the period of the suspension in the case of a suspension, and for 5 years in the case of a revocation, in respect of the same development in respect of which the offence was committed.

9.5 Enforcement of Decommissioning Plan

At the end of the operational life of the Wind Power Project, occurring either at the choice of the Owner and/or Operator or for any reason contemplated in this Bylaw, and upon a finding by the Development Officer that the Decommissioning

Plan has not been carried out in a way satisfactory to the Development Officer, the Development Officer may:

(i) give notice to the Owner and/or Operator advising him of any steps necessary to comply with the Decommission Plan and asking that the Owner and/or Operator to take these steps to complete Decommissioning at his costs;

(ii) after giving notice and providing the Owner and/or Operator with a reasonable time to complete Decommissioning, carry out any necessary steps for the Decommissioning of the Wind Power Project on behalf of the Owner and/or Operator. All costs incurred in the course of such Decommissioning of the Wind Power Project shall be the responsibility of the Owner and/or Operator and payable by the Owner and/or Operator to the Development Officer.

This Section shall operate in addition to the provisions contained on Section 9.3 of this Bylaw.

9.6 Appeals

Any person who, upon application, is refused a Wind Turbine Licence or renewal or whose Wind Turbine Licence is suspended may, by written notice to the Development Officer, within 30 days of receiving written notification of the refusal, suspension or revocation, file an appeal to Council and Council shall hear the appeal at a hearing within 60 days of the filing of the appeal and Council may allow the appeal, dismiss the appeal or vary the decision under appeal.

10. Severability

It is hereby declared that each and every of the foregoing Sections of this Bylaw is severable and that if any provision of this Bylaw should for any reason be declared invalid by any court, it is the intention and desire of the Council of the Municipality of the County of Colchester that each and every of the then remaining provisions hereof should remain in full force and effect.

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HUMAN HEALTH AND WIND FARMS – A LITERATURE REVIEW

In support of the Environmental Assessment (EA) for the Truro Heights 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 (Canadian Wind Energy Association [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 (Chief Medical Officer of Health of Ontario 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 (Scientific Committee on Emerging and Newly Identified Health Risks 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 (Electric and Magnetic Fields Research and Public Information Dissemination Program 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).

As part of a project prepared by the Finnish Meteorological Institute entitled "Wind Energy in Cold Climates (WECO)", a set of safety guidelines for wind developments in ice prone areas was developed. A risk assessment methodology demonstrated that the risk of being struck by ice thrown from a turbine is diminishingly small at distances greater than approximately 250 m from the turbine in a climate where moderate icing occurs (Morgan *et al*. 1998). With proper setbacks and on-sight safety awareness, hazards are minimized (Colby 2008; Massachusetts Department of Environmental Protection & Massachusetts Department of Public Health 2012).

Turbines for the proposed Project have been located greater than 740 m (turbine 5) from the nearest provincial road (Morgan Road) and 719 m (turbine 5) from the nearest seasonal woods camp. These mitigative strategies will decrease and/or eliminate the risk of injury from ice to nearby workers and drivers. 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).

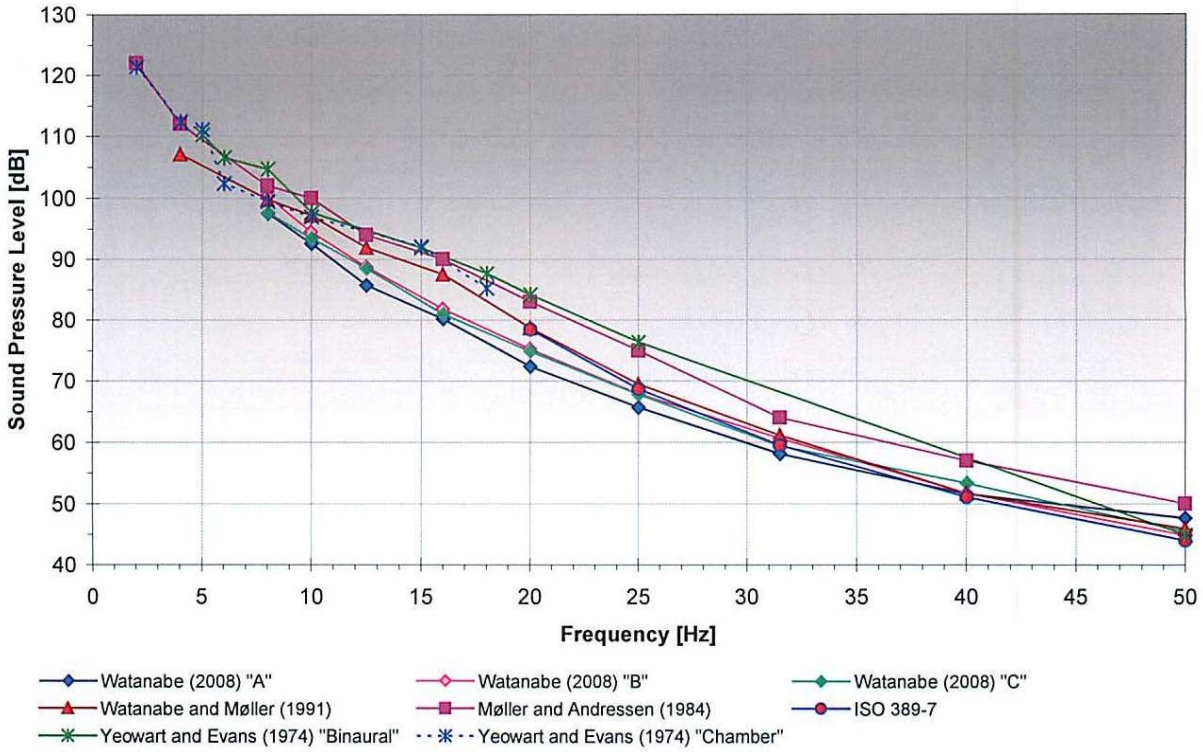

Figure 1: Threshold of Hearing Data from Various Papers (HGC 2010).

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

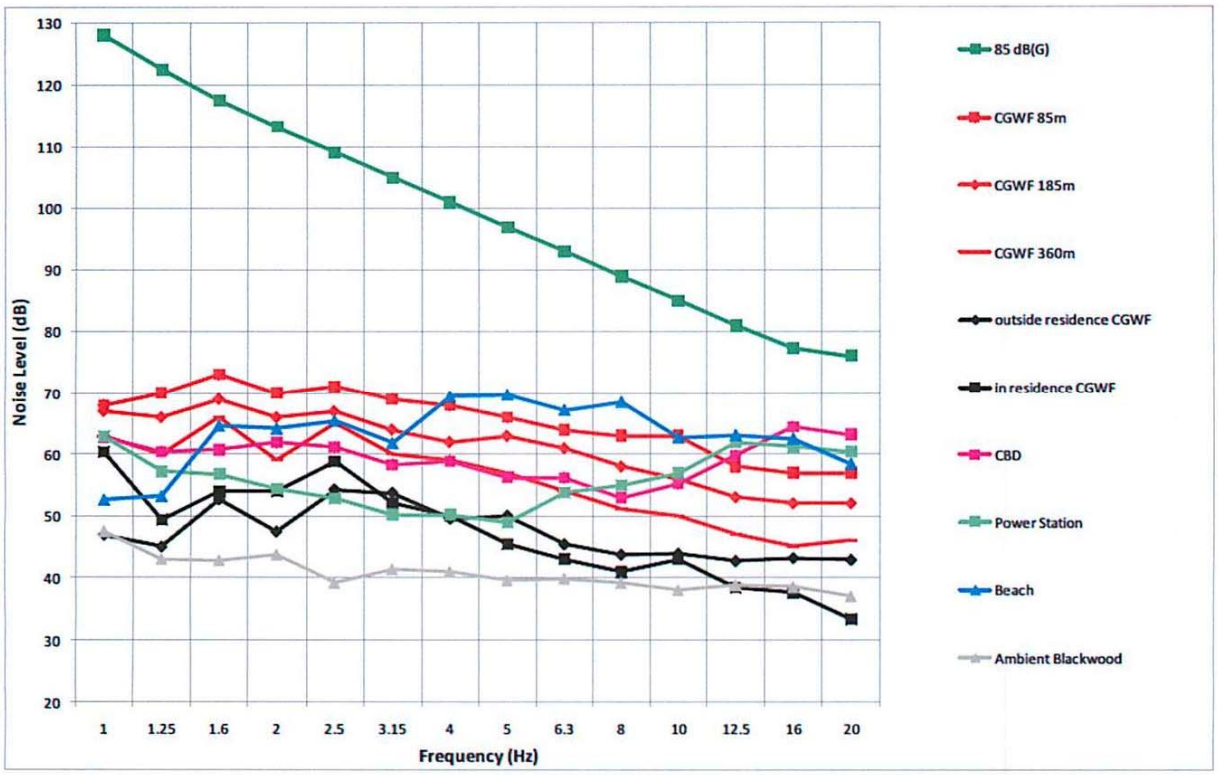

Figure 2: Summary of Measurement at the Clements Gap Wind Farm and Other Sources (Sonus Pty Ltd 2010)

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).

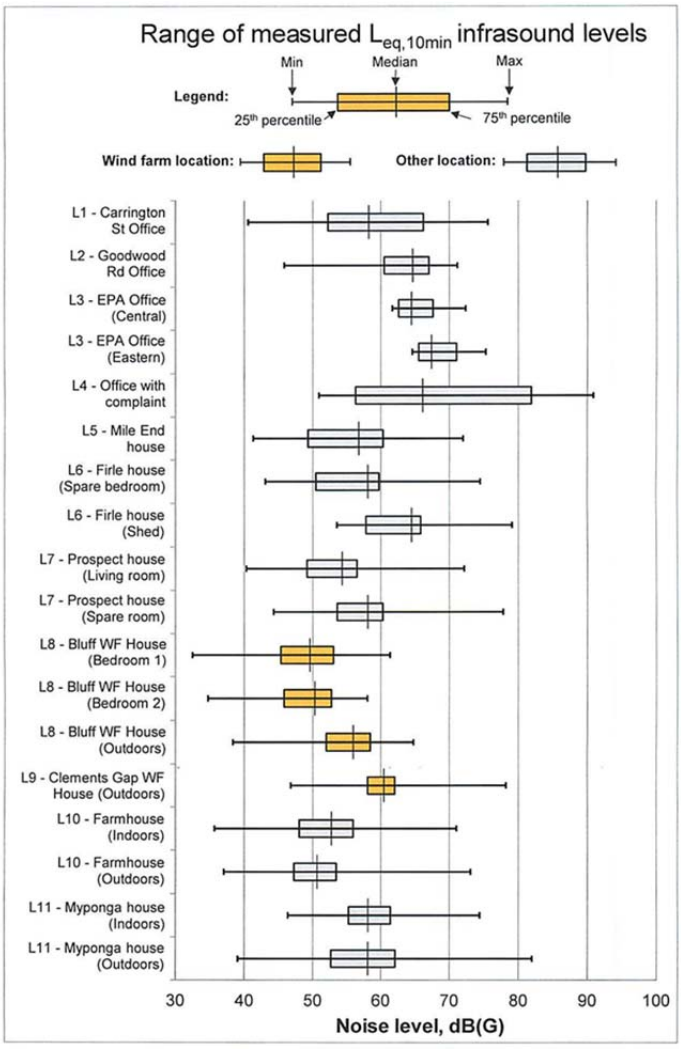

Figure 3: Range of Measured Infrasound Levels (Evans *et al*. 2013).

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.

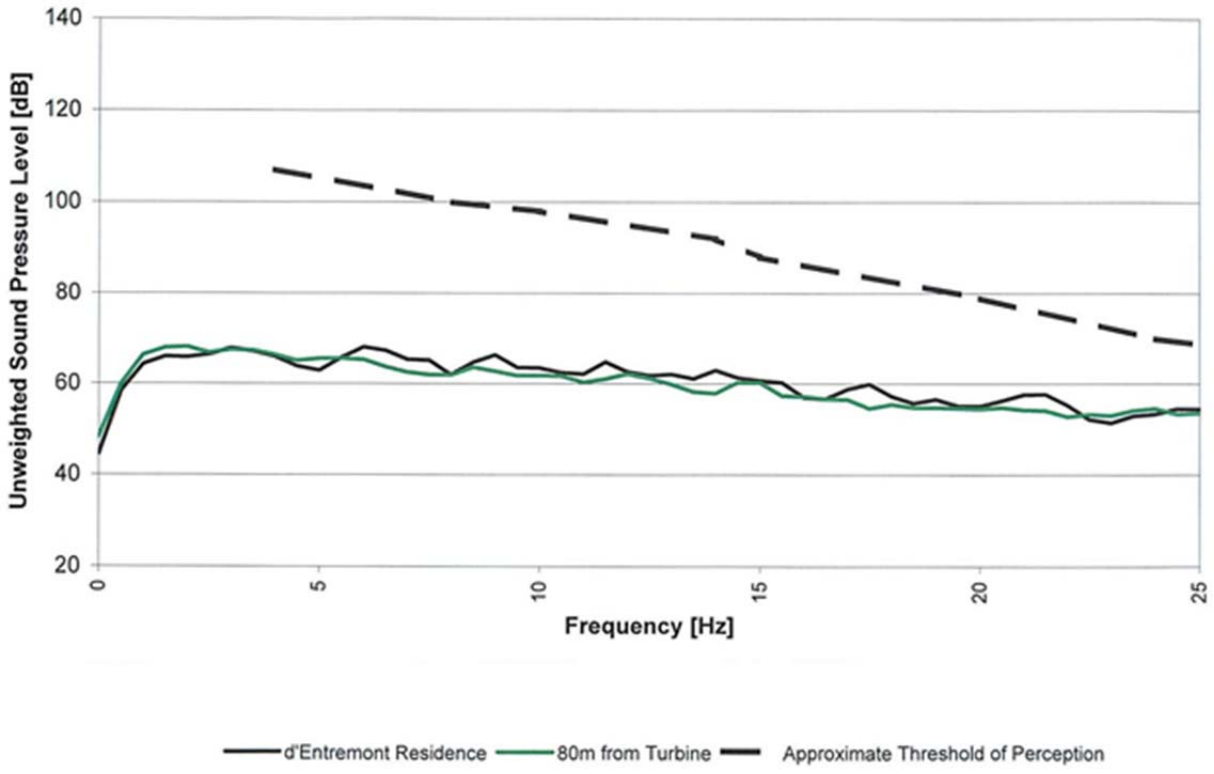

Figure 4: Infrasound Measurements at Pubnico Wind Farm (HGC 2006).

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" (Ellenbogan *et al*. 2012).

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APPENDIX D
WETLAND METHODOLOGY AND CHARACTERIZATIONS

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.

<u>Identification of Hydrophytic Vegetation</u>

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).

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[1]

Plant Species Classification	Abbreviation[2]	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.

[1] Source: Reed 1988

[2] 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.

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

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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	Treed swamp	Terrene	Basin	Outflow (drainage)	Organic (A1-Histosol)	1) Saturated at surface 2) Drainage patterns 3) Surface water (5 cm)	Gentle	New York fern (*Thelypteris noveboracensis*); cinnamon fern (*Osmundastrum cinnamomeum*); wooly bullrush (*Scirpus cyperinus*); American bullrush (*Scirpus americanus*); flat-topped white aster (*Doellingeria umbellata*)	yellow birch (*Betula alleghaniensis)*; black spruce (*Picea mariana*); balsam fir (*Abais balsamea)*	black spruce red maple (*Acer rubrum*)	Drains to the north via an ephemeral drainage channel.
2	Treed swamp	Terrene	Basin	Isolated	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Drainage patterns	Gentle	bluejoint grass (*Calamagrotis canadensis*); cinnamon fern; wooly bullrush	balsam fir; red maple; yellow birch; black spruce	red maple; white birch (*Betula papyrifera*); black spruce	None observed.
3a (north)	Shrub swamp	Terrene	Basin	Outflow (inferred)	Organic (A1-Histosol)	1) Saturated at surface 2) Surface water (10 to 15 cm deep)	Gentle	cinnamon fern; sensitive fern (*Onoclea sensibilis*); bunchberry (*Cornus canadensis*); three seeded sedge (*Carex trisperma*)	yellow birch; white birch; red maple	None (cutover)	None observed.
3b (south)	Treed swamp	Terrene	Basin	Outflow (inferred)	Organic (A1-Histosol)	1) Saturated at surface 2) Groundwater at 20 cm 3) Water stained leaves	Gentle	cinnamon fern; mountain holly (*Nemopanthus mucronata*); black spruce	black spruce; red maple; mountain holly	black spruce; red maple; white birch	None observed.
4	Shrub swamp	Terrene	Basin	Isolated	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Standing water	Gentle	woolly bullrush	trembling aspen (*Populus tremuloides)*; red maple; yellow birch	None	None observed.
5	Treed swamp	Terrene	Basin	Inflow (ephemeral)	Organic over bedrock (A1 - Histosol)	1) Saturated at surface 2) Standing water	Gentle	woolly bullrush; cinnamon fern	balsam fir; red maple	red maple; black spruce	Ephemeral drainage input in the south, no output observed.
6	Treed swamp	Terrene	Basin	Outflow (ephemeral)	Organic over bedrock (A1 - Histosol)	1) Standing water	Gentle	woolly bullrush; cinnamon fern	balsam fir; red maple	black spruce	Drains into road side ditch.
7	Treed swamp	Lotic stream (confined)	Basin	Outflow (ephemeral)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface; 2) Water stained leaves; 3) Drainage patterns 4) Oxidized photospheres	Gentle	New York fern; flat-topped white aster; cinnamon fern; grass sp.	balsam fir; yellow birch; black spruce	yellow birch	Ephemeral drainage input observed from the north. Drains into roadside ditch which sources watercourse 1.
8	Shrub swamp	Lotic stream (confined)	Basin	Throughflow (intermittent)	Organic (A1-Histosol)	1) Saturated at surface 2) Groundwater at 20 cm 3) Water stained leaves	Gentle	fringed sedge (*Carex critita*)	white birch; red maple	None	Ephemeral drainage input observed from the west. Ephemeral drainage output observed to the east.
9	Treed swamp	Terrene	Slope	Outflow (ephemeral)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Drainage patterns 3) Surface water (2 cm)	Gentle	cinnamon fern; rice cut grass (*Leersia oryzoides*); hay scented fern (*Dennstaedtia punctilobula*)	balsam fir; black spruce; white birch	black spruce; white birch; red maple	Drains ephemerally to the east.

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	
10a (north)	Treed swamp	Terrene	Basin	Outflow (inferred)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Groundwater within 20 cm 3) Drainage patterns 4) Water stained leaves	Gentle	New York fern; cinnamon fern	balsam fir; yellow birch	balsam fir; yellow birch	None observed.
10b (south)	Shrub swamp							New York fern; flat-topped white aster	balsam fir; yellow birch	None	
11	Treed swamp	Terrene	Basin	Isolated	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Hydrogen sulphide odor 3) Standing water	Gentle	cinnamon fern; New York fern	None	balsam fir; red maple	None observed.
12	Shrub swamp	Terrene	Basin	Inflow (ephemeral)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface; 2) Oxidized rhizospheres	Gentle	fringed sedge; sensitive fern	white birch; red maple	None	Ephemeral drainage input observed from the west.
13	Shrub swamp	Terrene	Flat / sloped	Throughflow (ephemeral)	Organic over sandy redox (S5 - Sandy redox)	1) Saturated at surface; 2) Drainage patterns; 3) Groundwater at 25 cm	Gentle	fringed sedge; cinnamon fern	white birch; black spruce	None	Drains east into watercourse 2.
14a (north)	Treed swamp	Terrene	Basin	Outflow	Organic (A-1 Histosol)	1) Saturated at surface 2) Drainage patterns 3) Surface water (5 cm)	Gentle	New York fern; cinnamon fern; woolly bullrush; American bullrush	yellow birch; black spruce; balsam fir	black spruce; red maple	Drains southeast across road into watercourse 2.
14b (south)	Treed swamp	Lotic stream (confined)	Flat / sloped	Outflow	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Water stained leaves 3) Surface water (5 cm)	Gentle	cinnamon fern; rice cut grass; hay scented fern	balsam fir; black spruce; white birch	black spruce; white birch; red maple	Drained by watercourse 2 to the east.
15	Treed swamp	Lotic stream (confined)	Basin	Outflow (inferred)	Organic over sandy redox (S5 - Sandy redox)	1) Saturated at surface 2) Groundwater within 20 cm 3) Drainage patterns 4) Water stained leaves	Gentle	New York fern; flat-topped white aster	balsam fir; red maple; yellow birch	balsam fir; red maple; yellow birch	None observed.
16	Shrub swamp	Lotic stream (confined)	Basin	Throughflow (ephemeral)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Drainage patterns 3) Surface water (2 cm deep)	Gentle	wooly bullrush	balsam fir; yellow birch	None	Drainage inflow observed from the east. Inferred outflow to the west.
17a	Treed swamp	Lotic stream (confined)	Basin	Outflow	Organic (A1-Histosol)	1) Saturated at surface 2) Drainage patterns 3) Water stained leaves 4) Groundwater at 10 cm	Gentle	cinnamon fern; bluejoint grass; sensitive fern	balsam fir	white birch; black spruce	Drained by watercourse 3 to the east.
17b	Treed swamp	Terrene	Basin	Outflow	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Drainage patterns	Gentle	cinnamon fern; sensitive fern	balsam fir	black spruce	Drains to the west into wetland 16.
17c	Shrub swamp	Terrene	Basin	Outflow	Organic over depleted mineral soils (A2 - Histic epipedon)	Saturated at surface	Gentle	woolly bullrush; bluejoint grass	white birch; balsam fir; red maple	None	Drains to the northeast into wetland 17A
17d	Treed swamp	Terrene	Basin	Outflow (ephemeral)	Organic (A1-Histosol)	Saturated at surface	Gentle	New York fern; cinnamon fern; balsam fir; bunchberry	balsam fir; yellow birch; black spruce	balsam fir; yellow birch; red maple	Ephemeral drainage output to the southwest.
17e	Treed swamp	Terrene	Basin	Outflow	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Drainage patterns 3) Water stained leaves 4) Groundwater within 15 cm	Gentle	cinnamon fern; evergreen wood fern (*Dryopteris intermediate*)	yellow birch	yellow birch	Drains to the north into wetland 17A.
17f	Treed swamp	Terrene	Basin	Outflow (ephemeral)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Groundwater at 10 cm 3) Drainage patterns	Gentle	cinnamon fern; New York fern; wood sorrel (*Oxalis spp.*)	yellow birch	yellow birch; red maple	Drainage output to the south.

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	
18	Treed swamp	Terrene	Basin	Isolated	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Surface water (10 cm deep)	Gentle	cinnamon fern; New York fern; bunchberry	balsam fir	balsam fir; red maple; white birch	Likely drains to the east via sub-surface seepage into wetland 20.
19	Treed swamp	Terrene	Basin	Outflow (ephemeral)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Standing water (3 cm deep)	Gentle	cinnamon fern; evergreen wood fern; wood sorrel; starflower (*Trientalis borealis*)	yellow birch	black spruce	Drainage output to the south.
20	Treed swamp	Terrene	Slope	Outflow (ephemeral)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Surface water (5 cm deep)	Gentle	sensitive fern; fringed sedge; hay scented fern; evergreen wood fern; bluejoint	balsam fir	red maple; white birch	Drainage output to the east.
21	Treed swamp	Terreme	Basin	Throughflow (entrenched)	Organic (A1-Histosol)	1) Saturated at surface 2) Groundwater at 10 cm	Moderate	three seeded sedge; bunchberry; New York fern	speckled alder (*Alnus incana*); red maple; yellow birch	red maple	The desktop review results indicate that watercourse 5 flows through this wetland south of the assessment area. Drainage input from the north was also observed.
22	Treed swamp	Terrene	Basin	Throughflow (entrenched)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Groundwater within 10 cm	Gentle to moderate	hay scented fern; evergreen wood fern; cinnamon fern	balsam fir; yellow birch; speckled alder; red maple	red maple; yellow birch; balsam fir	Watercourse 4 flows through this wetland from south to north.
23	Treed swamp	Terrene	Basin	Outflow (inferred)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Groundwater within 25 cm	Gentle	New York fern; balsam fir; swamp dewberry (*Rubus hispidus*)	balsam fir; yellow birch	yellow birch	None observed. Likely drains into watercourse 5.
24	Treed swamp	Lotic stream (confined)	Basin	Throughflow	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Groundwater at 20 cm	Gentle	tall white aster (*Aster umbellatus*); bog goldenrod (*Solidago uliginosa*); cinnamon fern	balsam fir; speckled alder	balsam fir	Watercourse 6 flows through this wetland from north to south.
25	Treed swamp	Terrene	Basin	Outflow (inferred)	Organic over depleted mineral soils (A2 - Histic epipedon)	1) Saturated at surface 2) Groundwater at 10 cm	Gentle	Labrador tea (*Rhododendron groenlandicum*); lambkill (*Kalmia agustofolia*); snowberry (*Symphoricarpos albus*); bunchberry	black spruce	black spruce	None observed.

APPENDIX E
ACCDC AND PROJECT SITE PLANT LISTS

Table E1: Short List of Rare Plant and Lichen Species Identified Within 100 KM of the Project Site *Project # 12-4328/4544*

SCIENTIFIC NAME	COMMON NAME	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Adiantum pedatum	Northern Maidenhair Fern	Not Listed	Not Listed	Not Listed	Red
Allium tricoccum	Wild Leek	Not Listed	Not Listed	Not Listed	Red
Alopecurus aequalis	Short-awned Foxtail	Not Listed	Not Listed	Not Listed	Yellow
Amelanchier nantucketensis	Nantucket Serviceberry	Not Listed	Not Listed	Not Listed	Red
Anemone canadensis	Canada Anemone	Not Listed	Not Listed	Not Listed	Yellow
Anemone quinquefolia	Wood Anemone	Not Listed	Not Listed	Not Listed	Yellow
Anemone virginiana	Virginia Anemone	Not Listed	Not Listed	Not Listed	Yellow
Anemone virginiana var. alba	Virginia Anemone	Not Listed	Not Listed	Not Listed	Yellow
Anemone virginiana var. virginiana	Virginia Anemone	Not Listed	Not Listed	Not Listed	Yellow
Antennaria parlinii	Parlin's Pussytoes	Not Listed	Not Listed	Not Listed	Red
Arabis drummondii	Drummond's Rockcress	Not Listed	Not Listed	Not Listed	Yellow
Arabis hirsuta var. pycnocarpa	Western Hairy Rockcress	Not Listed	Not Listed	Not Listed	Red
Asplenium trichomanes	Maidenhair Spleenwort	Not Listed	Not Listed	Not Listed	Yellow
Asplenium trichomanes-ramosum	Green Spleenwort	Not Listed	Not Listed	Not Listed	Yellow
Betula michauxii	Newfoundland Dwarf Birch	Not Listed	Not Listed	Not Listed	Yellow
Betula pumila var. pumila	Bog Birch	Not Listed	Not Listed	Not Listed	Yellow
Bidens connata	Purple-stemmed Beggarticks	Not Listed	Not Listed	Not Listed	Yellow
Bidens hyperborea	Estuary Beggarticks	Not Listed	Not Listed	Not Listed	Yellow
Botrychium lanceolatum var. angustisegmentum	Triangle Moonwort	Not Listed	Not Listed	Not Listed	Yellow
Botrychium lunaria	Common Moonwort	Not Listed	Not Listed	Not Listed	Red
Botrychium simplex	Least Moonwort	Not Listed	Not Listed	Not Listed	Yellow
Bromus latiglumis	Broad-Glumed Brome	Not Listed	Not Listed	Not Listed	Red
Calamagrostis stricta	Slim-stemmed Reed Grass	Not Listed	Not Listed	Not Listed	Yellow
Calamagrostis stricta ssp. stricta	Slim-stemmed Reed Grass	Not Listed	Not Listed	Not Listed	Yellow
Calamagrostis stricta var. stricta	Slim-stemmed Reed Grass	Not Listed	Not Listed	Not Listed	Yellow
Caltha palustris	Yellow Marsh Marigold	Not Listed	Not Listed	Not Listed	Yellow
Campanula aparinoides	Marsh Bellflower	Not Listed	Not Listed	Not Listed	Yellow
Cardamine maxima	Large Toothwort	Not Listed	Not Listed	Not Listed	Red
Cardamine parviflora var. arenicola	Small-flowered Bittercress	Not Listed	Not Listed	Not Listed	Yellow
Carex adusta	Lesser Brown Sedge	Not Listed	Not Listed	Not Listed	Yellow
Carex atratiformis	Scabrous Black Sedge	Not Listed	Not Listed	Not Listed	Yellow
Carex bebbii	Bebb's Sedge	Not Listed	Not Listed	Not Listed	Red
Carex capillaris	Hairlike Sedge	Not Listed	Not Listed	Not Listed	Yellow
Carex castanea	Chestnut Sedge	Not Listed	Not Listed	Not Listed	Red
Carex chordorrhiza	Creeping Sedge	Not Listed	Not Listed	Not Listed	Red
Carex comosa	Bearded Sedge	Not Listed	Not Listed	Not Listed	Yellow
Carex eburnea	Bristle-leaved Sedge	Not Listed	Not Listed	Not Listed	Yellow
Carex garberi	Garber's Sedge	Not Listed	Not Listed	Not Listed	Red
Carex haydenii	Hayden's Sedge	Not Listed	Not Listed	Not Listed	Red
Carex hirtifolia	Pubescent Sedge	Not Listed	Not Listed	Not Listed	Yellow
Carex houghtoniana	Houghton's Sedge	Not Listed	Not Listed	Not Listed	Yellow
Carex hystericina	Porcupine Sedge	Not Listed	Not Listed	Not Listed	Red
Carex laxiflora var. laxiflora	Loose-Flowered Sedge	Not Listed	Not Listed	Not Listed	Red
Carex livida var. radicaulis	Livid Sedge	Not Listed	Not Listed	Not Listed	Red
Carex peckii	Peck's Sedge	Not Listed	Not Listed	Not Listed	Red
Carex pellita	Woolly Sedge	Not Listed	Not Listed	Not Listed	Red
Carex plantaginea	Plantain-Leaved Sedge	Not Listed	Not Listed	Not Listed	Red
Carex prairea	Prairie Sedge	Not Listed	Not Listed	Not Listed	Red
Carex tenera	Tender Sedge	Not Listed	Not Listed	Not Listed	Yellow
Carex tuckermanii	Tuckerman's Sedge	Not Listed	Not Listed	Not Listed	Red
Carex wiegandii	Wiegand's Sedge	Not Listed	Not Listed	Not Listed	Red
Caulophyllum thalictroides	Blue Cohosh	Not Listed	Not Listed	Not Listed	Red
Chenopodium rubrum	Red Pigweed	Not Listed	Not Listed	Not Listed	Red
Clematis occidentalis	Purple Clematis	Not Listed	Not Listed	Not Listed	Red
Clethra alnifolia	Coastal Sweet Pepperbush	Special Concern	Vulnerable	Special Concern	Yellow
Coeloglossum viride var. virescens	Long-bracted Frog Orchid	Not Listed	Not Listed	Not Listed	Red
Conioselinum chinense	Chinese Hemlock-parsley	Not Listed	Not Listed	Not Listed	Yellow
Conopholis americana	American Cancer-root	Not Listed	Not Listed	Not Listed	Red
Cryptogramma stelleri	Steller's Rockbrake	Not Listed	Not Listed	Not Listed	Red
Cuscuta cephalanthi	Buttonbush Dodder	Not Listed	Not Listed	Not Listed	Red
Cynoglossum virginianum var. boreale	Wild Comfrey	Not Listed	Not Listed	Not Listed	Red
Cypripedium arietinum	Ram's-Head Lady's-Slipper	Not Listed	Endangered	Not Listed	Red
Cypripedium parviflorum	Yellow Lady's-slipper	Not Listed	Not Listed	Not Listed	Yellow
Cypripedium parviflorum var. makasin	Yellow Lady's-slipper	Not Listed	Not Listed	Not Listed	Yellow
Cypripedium parviflorum var. pubescens	Yellow Lady's-slipper	Not Listed	Not Listed	Not Listed	Yellow
Cypripedium reginae	Showy Lady's-Slipper	Not Listed	Not Listed	Not Listed	Red

Table E1: Short List of Rare Plant and Lichen Species Identified Within 100 KM of the Project Site *Project # 12-4328/4544*

SCIENTIFIC NAME	COMMON NAME	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Desmodium canadense	Canada Tick-trefoil	Not Listed	Not Listed	Not Listed	Red
Desmodium glutinosum	Large Tick-Trefoil	Not Listed	Not Listed	Not Listed	Red
Dichanthelium linearifolium	Narrow-leaved Panic Grass	Not Listed	Not Listed	Not Listed	Yellow
Dirca palustris	Eastern Leatherwood	Not Listed	Not Listed	Not Listed	Red
Draba arabisans	Rock Whitlow-Grass	Not Listed	Not Listed	Not Listed	Red
Draba glabella	Rock Whitlow-Grass	Not Listed	Not Listed	Not Listed	Red
Dryopteris fragrans var. remotiuscula	Fragrant Wood Fern	Not Listed	Not Listed	Not Listed	Yellow
Eleocharis olivacea	Yellow Spikerush	Not Listed	Not Listed	Not Listed	Yellow
Eleocharis ovata	Ovate Spikerush	Not Listed	Not Listed	Not Listed	Yellow
Elymus hystrix	Spreading Wild Rye	Not Listed	Not Listed	Not Listed	Red
Elymus hystrix var. bigeloviana	Spreading Wild Rye	Not Listed	Not Listed	Not Listed	Red
Elymus wiegandii	Wiegand's Wild Rye	Not Listed	Not Listed	Not Listed	Red
Empetrum eamesii	Pink Crowberry	Not Listed	Not Listed	Not Listed	Yellow
Epilobium coloratum	Purple-veined Willowherb	Not Listed	Not Listed	Not Listed	Yellow
Epilobium strictum	Downy Willowherb	Not Listed	Not Listed	Not Listed	Yellow
Equisetum pratense	Meadow Horsetail	Not Listed	Not Listed	Not Listed	Yellow
Erigeron hyssopifolius	Hyssop-leaved Fleabane	Not Listed	Not Listed	Not Listed	Yellow
Erigeron philadelphicus	Philadelphia Fleabane	Not Listed	Not Listed	Not Listed	Yellow
Erioderma pedicellatum (Atlantic pop.)	Boreal Felt Lichen (Atlantic pop.)	Endangered	Endangered	Endangered	Red
Eriophorum gracile	Slender Cottongrass	Not Listed	Not Listed	Not Listed	Yellow
Festuca subverticillata	Nodding Fescue	Not Listed	Not Listed	Not Listed	Red
Floerkea proserpinacoides	False Mermaidweed	Not Listed	Not Listed	Not at Risk	Yellow
Fraxinus nigra	Black Ash	Not Listed	Not Listed	Not Listed	Yellow
Fraxinus pennsylvanica	Red Ash	Not Listed	Not Listed	Not Listed	Red
Galium boreale	Northern Bedstraw	Not Listed	Not Listed	Not Listed	Red
Galium labradoricum	Labrador Bedstraw	Not Listed	Not Listed	Not Listed	Yellow
Geocaulon lividum	Northern Comandra	Not Listed	Not Listed	Not Listed	Yellow
Goodyera pubescens	Downy Rattlesnake-Plantain	Not Listed	Not Listed	Not Listed	Red
Goodyera repens	Lesser Rattlesnake-plantain	Not Listed	Not Listed	Not Listed	Yellow
Gratiola neglecta	Clammy Hedge-Hyssop	Not Listed	Not Listed	Not Listed	Yellow
Hedeoma pulegioides	American False Pennyroyal	Not Listed	Not Listed	Not Listed	Yellow
Helianthemum canadense	Long-branched Frostweed	Not Listed	Endangered	Not Listed	Red
Hepatica nobilis	Round-Lobe Hepatica	Not Listed	Not Listed	Not Listed	Red
Hepatica nobilis var. obtusa	Round-lobed Hepatica	Not Listed	Not Listed	Not Listed	Red
Hieracium robinsonii	Robinson's Hawkweed	Not Listed	Not Listed	Not Listed	Yellow
Hudsonia ericoides	Pinebarren Golden Heather	Not Listed	Not Listed	Not Listed	Yellow
Hudsonia tomentosa	Woolly Beach-heath	Not Listed	Not Listed	Not Listed	Red
Hypericum dissimulatum	Disguised St John's-wort	Not Listed	Not Listed	Not Listed	Yellow
Hypericum majus	Large St. John's-wort	Not Listed	Not Listed	Not Listed	Red
Impatiens pallida	Pale Jewelweed	Not Listed	Not Listed	Not Listed	Yellow
Isoetes acadiensis	Acadian Quillwort	Not Listed	Not Listed	Not Listed	Yellow
Isoetes prototypus	Prototype Quillwort	Special Concern	Vulnerable	Special Concern	Red
Juncus dudleyi	Dudley's Rush	Not Listed	Not Listed	Not Listed	Yellow
Juncus greenei	Greene's Rush	Not Listed	Not Listed	Not Listed	Red
Juncus marginatus	Grass-leaved Rush	Not Listed	Not Listed	Not Listed	Yellow
Juncus stygius ssp. americanus	Moor Rush	Not Listed	Not Listed	Not Listed	Yellow
Lactuca hirsuta var. sanguinea	Hairy Lettuce	Not Listed	Not Listed	Not Listed	Yellow
Laportea canadensis	Canada Wood Nettle	Not Listed	Not Listed	Not Listed	Yellow
Lilaeopsis chinensis	Eastern Lilaeopsis	Special Concern	Vulnerable	Special Concern	Yellow
Lilium canadense	Canada Lily	Not Listed	Not Listed	Not Listed	Yellow
Limosella australis	Southern Mudwort	Not Listed	Not Listed	Not Listed	Yellow
Listera australis	Southern Twayblade	Not Listed	Not Listed	Not Listed	Red
Lobelia spicata	Pale-Spiked Lobelia	Not Listed	Not Listed	Not Listed	Red
Malaxis brachypoda	White Adder's-Mouth	Not Listed	Not Listed	Not Listed	Red
Megalodonta beckii	Water Beggarticks	Not Listed	Not Listed	Not Listed	Yellow
Minuartia groenlandica	Greenland Stitchwort	Not Listed	Not Listed	Not Listed	Yellow
Montia fontana	Water Blinks	Not Listed	Not Listed	Not Listed	Red
Myriophyllum farwellii	Farwell's Water Milfoil	Not Listed	Not Listed	Not Listed	Yellow
Myriophyllum verticillatum	Whorled Water Milfoil	Not Listed	Not Listed	Not Listed	Yellow
Ophioglossum pusillum	Northern Adder's-tongue	Not Listed	Not Listed	Not Listed	Yellow
Osmorhiza depauperata	Blunt Sweet Cicely	Not Listed	Not Listed	Not Listed	Red
Osmorhiza longistylis	Smooth Sweet Cicely	Not Listed	Not Listed	Not Listed	Yellow
Pilea pumila	Dwarf Clearweed	Not Listed	Not Listed	Not Listed	Red
Piptatherum canadense	Canada Rice Grass	Not Listed	Not Listed	Not Listed	Yellow
Platanthera flava	Tubercled Orchid	Not Listed	Not Listed	Not Listed	Yellow
Platanthera flava var. flava	Tubercled Orchid	Not Listed	Not Listed	Not Listed	Yellow

Table E1: Short List of Rare Plant and Lichen Species Identified Within 100 KM of the Project Site *Project # 12-4328/4544*

SCIENTIFIC NAME	COMMON NAME	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Platanthera flava var. herbiola	Tubercled Orchid	Not Listed	Not Listed	Not Listed	Yellow
Platanthera macrophylla	Large Round-Leaved Orchid	Not Listed	Not Listed	Not Listed	Yellow
Poa glauca	Glaucous Blue Grass	Not Listed	Not Listed	Not Listed	Yellow
Polygala sanguinea	Blood Milkwort	Not Listed	Not Listed	Not Listed	Yellow
Polygonum arifolium	Halberd-leaved Tearthumb	Not Listed	Not Listed	Not Listed	Yellow
Polygonum scandens	Climbing False Buckwheat	Not Listed	Not Listed	Not Listed	Yellow
Potamogeton obtusifolius	Blunt-leaved Pondweed	Not Listed	Not Listed	Not Listed	Yellow
Potamogeton zosteriformis	Flat-stemmed Pondweed	Not Listed	Not Listed	Not Listed	Yellow
Primula mistassinica	Mistassini Primrose	Not Listed	Not Listed	Not Listed	Yellow
Puccinellia fasciculata	Saltmarsh Alkali Grass	Not Listed	Not Listed	Not Listed	Extirpated
Ranunculus pensylvanicus	Pennsylvania Buttercup	Not Listed	Not Listed	Not Listed	Red
Ranunculus sceleratus	Cursed Buttercup	Not Listed	Not Listed	Not Listed	Red
Rhamnus alnifolia	Alder-leaved Buckthorn	Not Listed	Not Listed	Not Listed	Yellow
Rudbeckia laciniata	Cut-Leaved Coneflower	Not Listed	Not Listed	Not Listed	Yellow
Rudbeckia laciniata var. gaspereauensis	Cut-Leaved Coneflower	Not Listed	Not Listed	Not Listed	Yellow
Rumex salicifolius var. mexicanus	Triangular-valve Dock	Not Listed	Not Listed	Not Listed	Yellow
Salix pedicellaris	Bog Willow	Not Listed	Not Listed	Not Listed	Yellow
Salix sericea	Silky Willow	Not Listed	Not Listed	Not Listed	Yellow
Samolus valerandi ssp. parviflorus	Seaside Brookweed	Not Listed	Not Listed	Not Listed	Yellow
Sanicula odorata	Clustered Sanicle	Not Listed	Not Listed	Not Listed	Red
Saxifraga paniculata ssp. neogaea	White Mountain Saxifrage	Not Listed	Not Listed	Not Listed	Yellow
Senecio pseudoarnica	Seabeach Ragwort	Not Listed	Not Listed	Not Listed	Yellow
Shepherdia canadensis	Soapberry	Not Listed	Not Listed	Not Listed	Yellow
Solidago hispida	Hairy Goldenrod	Not Listed	Not Listed	Not Listed	Red
Spiranthes casei var. casei	Case's Ladies'-Tresses	Not Listed	Not Listed	Not Listed	Yellow
Spiranthes lucida	Shining Ladies'-Tresses	Not Listed	Not Listed	Not Listed	Red
Spiranthes ochroleuca	Yellow Ladies'-tresses	Not Listed	Not Listed	Not Listed	Yellow
Stellaria humifusa	Saltmarsh Starwort	Not Listed	Not Listed	Not Listed	Yellow
Stellaria longifolia	Long-leaved Starwort	Not Listed	Not Listed	Not Listed	Yellow
Suaeda rolandii	Roland's Sea-Blite	Not Listed	Not Listed	Not Listed	Red
Symphyotrichum boreale	Boreal Aster	Not Listed	Not Listed	Not Listed	Yellow
Symphyotrichum ciliolatum	Fringed Blue Aster	Not Listed	Not Listed	Not Listed	Yellow
Symphyotrichum undulatum	Wavy-leaved Aster	Not Listed	Not Listed	Not Listed	Yellow
Teucrium canadense	Canada Germander	Not Listed	Not Listed	Not Listed	Yellow
Thuja occidentalis	Eastern White Cedar	Not Listed	Vulnerable	Not Listed	Red
Tiarella cordifolia	Heart-leaved Foamflower	Not Listed	Not Listed	Not Listed	Yellow
Triosteum aurantiacum	Orange-fruited Tinker's Weed	Not Listed	Not Listed	Not Listed	Yellow
Utricularia gibba	Humped Bladderwort	Not Listed	Not Listed	Not Listed	Yellow
Vaccinium boreale	Northern Blueberry	Not Listed	Not Listed	Not Listed	Red
Vaccinium caespitosum	Dwarf Bilberry	Not Listed	Not Listed	Not Listed	Yellow
Vaccinium uliginosum	Alpine Bilberry	Not Listed	Not Listed	Not Listed	Yellow
Vallisneria americana	Wild Celery	Not Listed	Not Listed	Not Listed	Red
Viburnum edule	Squashberry	Not Listed	Not Listed	Not Listed	Yellow
Viola nephrophylla	Northern Bog Violet	Not Listed	Not Listed	Not Listed	Yellow
Woodsia glabella	Smooth Cliff Fern	Not Listed	Not Listed	Not Listed	Yellow
Zizia aurea	Golden Alexanders	Not Listed	Not Listed	Not Listed	Yellow

Scientific Name	Common Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Abies balsamea	Balsam Fir	Not Listed	Not Listed	Not Listed	Green
Acer pensylvanicum	Striped Maple	Not Listed	Not Listed	Not Listed	Green
Acer rubrum	Red Maple	Not Listed	Not Listed	Not Listed	Green
Acer saccharum	Sugar Maple	Not Listed	Not Listed	Not Listed	Green
Acer spicatum	Mountain Maple	Not Listed	Not Listed	Not Listed	Green
Achillea millefolium	Common Yarrow	Not Listed	Not Listed	Not Listed	Green
Actaea rubra	Red Baneberry	Not Listed	Not Listed	Not Listed	Green
Agrostis perennans	Upland Bent Grass	Not Listed	Not Listed	Not Listed	Green
Alnus incana	Speckled Alder	Not Listed	Not Listed	Not Listed	Green
Amelanchier bartramiana	Bartram's Serviceberry	Not Listed	Not Listed	Not Listed	Green
Anaphalis margaritacea	Pearly Everlasting	Not Listed	Not Listed	Not Listed	Green
Aralia nudicaulis	Wild Sarsaparilla	Not Listed	Not Listed	Not Listed	Green
Arisaema triphyllum	Jack-in-the-pulpit	Not Listed	Not Listed	Not Listed	Green
Betula alleghaniensis	Yellow Birch	Not Listed	Not Listed	Not Listed	Green
Betula papyrifera	Paper Birch	Not Listed	Not Listed	Not Listed	Green
Betula populifolia	Gray Birch	Not Listed	Not Listed	Not Listed	Green
Brachyelytrum septentrionale	Bearded Short-Husk	Not Listed	Not Listed	Not Listed	Green
Calamagrostis canadensis	Bluejoint Reed Grass	Not Listed	Not Listed	Not Listed	Green
Carex crinita	Fringed Sedge	Not Listed	Not Listed	Not Listed	Green
Carex debilis	White-edged Sedge	Not Listed	Not Listed	Not Listed	Green
Carex exilis	Coastal Sedge	Not Listed	Not Listed	Not Listed	Green
Carex intumescens	Bladder Sedge	Not Listed	Not Listed	Not Listed	Green
Carex lurida	Sallow Sedge	Not Listed	Not Listed	Not Listed	Green
Carex scoparia	Broom Sedge	Not Listed	Not Listed	Not Listed	Green
Carex stipata	Awl-fruited Sedge	Not Listed	Not Listed	Not Listed	Green
Carex trisperma	Three-seeded Sedge	Not Listed	Not Listed	Not Listed	Green
Centaurea nigra	Black Knapweed	Not Listed	Not Listed	Not Listed	Exotic
Circaea alpina	Small Enchanter's Nightshade	Not Listed	Not Listed	Not Listed	Green
Clintonia borealis	Yellow Bluebead Lily	Not Listed	Not Listed	Not Listed	Green
Coptis trifolia	Goldthread	Not Listed	Not Listed	Not Listed	Green
Cornus canadensis	Bunchberry	Not Listed	Not Listed	Not Listed	Green
Cypripedium acaule	Pink Lady's-slipper	Not Listed	Not Listed	Not Listed	Green
Danthonia compressa	Flattened Oat Grass	Not Listed	Not Listed	Not Listed	Green

Scientific Name	Common Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Danthonia spicata	Poverty Oat Grass	Not Listed	Not Listed	Not Listed	Green
Dennstaedtia punctilobula	Eastern Hay-scented Fern	Not Listed	Not Listed	Not Listed	Green
Doellingeria umbellata	Hairy Flat-top White Aster	Not Listed	Not Listed	Not Listed	Green
Dryopteris campyloptera	Mountain Wood Fern	Not Listed	Not Listed	Not Listed	Green
Dryopteris cristata	Crested Wood Fern	Not Listed	Not Listed	Not Listed	Green
Dryopteris intermedia	Evergreen Wood Fern	Not Listed	Not Listed	Not Listed	Green
Equisetum arvense	Field Horsetail	Not Listed	Not Listed	Not Listed	Green
Equisetum sylvaticum	Woodland Horsetail	Not Listed	Not Listed	Not Listed	Green
Eriophorum virginicum	Tawny Cottongrass	Not Listed	Not Listed	Not Listed	Green
Eriophorum viridicarinatum	Green-keeled Cottongrass	Not Listed	Not Listed	Not Listed	Green
Euphrasia stricta	Stiff Eyebright	Not Listed	Not Listed	Not Listed	Exotic
Eurybia radula	Low Rough Aster	Not Listed	Not Listed	Not Listed	Green
Euthamia graminifolia	Grass-leaved Goldenrod	Not Listed	Not Listed	Not Listed	Green
Fagus grandifolia	American Beech	Not Listed	Not Listed	Not Listed	Green
Fragaria virginiana	Wild Strawberry	Not Listed	Not Listed	Not Listed	Green
Fraxinus americana	White Ash	Not Listed	Not Listed	Not Listed	Green
Galium palustre	Common Marsh Bedstraw	Not Listed	Not Listed	Not Listed	Green
Gaultheria hispidula	Creeping Snowberry	Not Listed	Not Listed	Not Listed	Green
Gaultheria procumbens	Eastern Teaberry	Not Listed	Not Listed	Not Listed	Green
Gaylussacia baccata	Black Huckleberry	Not Listed	Not Listed	Not Listed	Green
Glyceria canadensis	Canada Manna Grass	Not Listed	Not Listed	Not Listed	Green
Glyceria striata	Fowl Manna Grass	Not Listed	Not Listed	Not Listed	Green
Gymnocarpium dryopteris	Common Oak Fern	Not Listed	Not Listed	Not Listed	Green
Hieracium canadense	Canada Hawkweed	Not Listed	Not Listed	Not Listed	Green
Hieracium vulgatum	Common Hawkweed	Not Listed	Not Listed	Not Listed	Exotic
Hieracium paniculatum	Panicled Hawkweed	Not Listed	Not Listed	Not Listed	Green
Hieracium pilosella	Mouse-ear Hawkweed	Not Listed	Not Listed	Not Listed	Exotic
Hieracium piloselloides	Tall Hawkweed	Not Listed	Not Listed	Not Listed	Exotic
Hypericum perforatum	Common St. John's-wort	Not Listed	Not Listed	Not Listed	Exotic
Ilex verticillata	Common Winterberry	Not Listed	Not Listed	Not Listed	Green
Impatiens capensis	Spotted Jewelweed	Not Listed	Not Listed	Not Listed	Green
Juncus canadensis	Canada Rush	Not Listed	Not Listed	Not Listed	Green
Juncus effusus	Soft Rush	Not Listed	Not Listed	Not Listed	Green

Scientific Name	Common Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Juncus tenuis	Path Rush	Not Listed	Not Listed	Not Listed	Green
Kalmia angustifolia	Sheep Laurel	Not Listed	Not Listed	Not Listed	Green
Ledum groenlandicum	Common Labrador Tea	Not Listed	Not Listed	Not Listed	Green
Leontodon autumnalis	Fall Dandelion	Not Listed	Not Listed	Not Listed	Exotic
Linnaea borealis	Twinflower	Not Listed	Not Listed	Not Listed	Green
Lonicera villosa	Mountain Fly Honeysuckle	Not Listed	Not Listed	Not Listed	Green
Lycopodium annotinum	Stiff Clubmoss	Not Listed	Not Listed	Not Listed	Green
Lycopodium dendroideum	Round-branched Tree-clubmoss	Not Listed	Not Listed	Not Listed	Green
Lycopus uniflorus	Northern Water Horehound	Not Listed	Not Listed	Not Listed	Green
Lysimachia terrestris	Swamp Yellow Loosestrife	Not Listed	Not Listed	Not Listed	Green
Lythrum salicaria	Purple Loosestrife	Not Listed	Not Listed	Not Listed	Exotic
Maianthemum canadense	Wild Lily-of-the-valley	Not Listed	Not Listed	Not Listed	Green
Mitchella repens	Partridgeberry	Not Listed	Not Listed	Not Listed	Green
Monotropa uniflora	Indian Pipe	Not Listed	Not Listed	Not Listed	Green
Nemopanthus mucronatus	Mountain Holly	Not Listed	Not Listed	Not Listed	Green
Oclemena acuminata	Whorled Wood Aster	Not Listed	Not Listed	Not Listed	Green
Onoclea sensibilis	Sensitive Fern	Not Listed	Not Listed	Not Listed	Green
Osmunda cinnamomea	Cinnamon Fern	Not Listed	Not Listed	Not Listed	Green
Osmunda claytoniana	Interrupted Fern	Not Listed	Not Listed	Not Listed	Green
Oxalis montana	Common Wood Sorrel	Not Listed	Not Listed	Not Listed	Green
Petasites frigidus	Northern Sweet Coltsfoot	Not Listed	Not Listed	Not Listed	Green
Phegopteris connectilis	Northern Beech Fern	Not Listed	Not Listed	Not Listed	Green
Phleum pratense	Common Timothy	Not Listed	Not Listed	Not Listed	Exotic
Picea glauca	White Spruce	Not Listed	Not Listed	Not Listed	Green
Picea mariana	Black Spruce	Not Listed	Not Listed	Not Listed	Green
Picea rubens	Red Spruce	Not Listed	Not Listed	Not Listed	Green
Pinus strobus	Eastern White Pine	Not Listed	Not Listed	Not Listed	Green
Plantago major	Common Plantain	Not Listed	Not Listed	Not Listed	Exotic
Platanthera clavellata	Club Spur Orchid	Not Listed	Not Listed	Not Listed	Green
Platanthera lacera	Ragged Fringed Orchid	Not Listed	Not Listed	Not Listed	Green
Polygonum (Fallopia) convolvulus	Black Bindweed	Not Listed	Not Listed	Not Listed	Exotic
Polygonum sagittatum	Arrow-Leaved Tearthumb	Not Listed	Not Listed	Not Listed	Green
Polystichum acrostichoides	Christmas Fern	Not Listed	Not Listed	Not Listed	Green

Scientific Name	Common Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Populus grandidentata	Large-toothed Aspen	Not Listed	Not Listed	Not Listed	Green
Populus tremuloides	Trembling Aspen	Not Listed	Not Listed	Not Listed	Green
Potamogeton epihydrus	Ribbon-leaved Pondweed	Not Listed	Not Listed	Not Listed	Green
Potentilla simplex	Old Field Cinquefoil	Not Listed	Not Listed	Not Listed	Green
Prenanthes altissima	Tall Rattlesnakeroot	Not Listed	Not Listed	Not Listed	Green
Prenanthes trifoliolata	Three-leaved Rattlesnakeroot	Not Listed	Not Listed	Not Listed	Green
Prunella vulgaris	Common Self-heal	Not Listed	Not Listed	Not Listed	Green
Prunus pensylvanica	Pin Cherry	Not Listed	Not Listed	Not Listed	Green
Pteridium aquilinum	Bracken Fern	Not Listed	Not Listed	Not Listed	Green
Ranunculus repens	Creeping Buttercup	Not Listed	Not Listed	Not Listed	Exotic
Rhododendron canadense	Rhodora	Not Listed	Not Listed	Not Listed	Green
Ribes glandulosum	Skunk Currant	Not Listed	Not Listed	Not Listed	Green
Rubus allegheniensis	Alleghaney Blackberry	Not Listed	Not Listed	Not Listed	Green
Rubus hispidus	Bristly Dewberry	Not Listed	Not Listed	Not Listed	Green
Rubus idaeus	Red Raspberry	Not Listed	Not Listed	Not Listed	Green
Rubus pubescens	Dwarf Red Raspberry	Not Listed	Not Listed	Not Listed	Green
Rumex acetosella	Sheep Sorrel	Not Listed	Not Listed	Not Listed	Exotic
Salix discolor	Pussy Willow	Not Listed	Not Listed	Not Listed	Green
Sarracenia purpurea	Northern Pitcher Plant	Not Listed	Not Listed	Not Listed	Green
Scirpus cyperinus	Common Woolly Bulrush	Not Listed	Not Listed	Not Listed	Green
Senecio viscosus	Sticky Ragwort	Not Listed	Not Listed	Not Listed	Exotic
Solidago canadensis	Canada Goldenrod	Not Listed	Not Listed	Not Listed	Green
Solidago flexicaulis	Zigzag Goldenrod	Not Listed	Not Listed	Not Listed	Green
Solidago rugosa	Rough-stemmed Goldenrod	Not Listed	Not Listed	Not Listed	Green
Sparganium americanum	American Burreed	Not Listed	Not Listed	Not Listed	Green
Spiraea alba	White Meadowsweet	Not Listed	Not Listed	Not Listed	Green
Spiraea tomentosa	Steeplebush	Not Listed	Not Listed	Not Listed	Green
Spiranthes cernua	Nodding Ladies'-tresses	Not Listed	Not Listed	Not Listed	Green
Streptopus lanceolatus	Rose Twisted-stalk	Not Listed	Not Listed	Not Listed	Green
Symphyotrichum lateriflorum	Calico Aster	Not Listed	Not Listed	Not Listed	Green
Symphyotrichum novi-belgii	New York Aster	Not Listed	Not Listed	Not Listed	Green
Thelypteris noveboracensis	New York Fern	Not Listed	Not Listed	Not Listed	Green
Trientalis borealis	Northern Starflower	Not Listed	Not Listed	Not Listed	Green

Scientific Name	Common Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Trillium undulatum	Painted Trillium	Not Listed	Not Listed	Not Listed	Green
Tsuga canadensis	Eastern Hemlock	Not Listed	Not Listed	Not Listed	Green
Tussilago farfara	Coltsfoot	Not Listed	Not Listed	Not Listed	Exotic
Typha latifolia	Broad-leaved Cattail	Not Listed	Not Listed	Not Listed	Green
Vaccinium myrtilloides	Velvet-leaved Blueberry	Not Listed	Not Listed	Not Listed	Green
Veronica americana	American Speedwell	Not Listed	Not Listed	Not Listed	Green
Veronica officinalis	Common Speedwell	Not Listed	Not Listed	Not Listed	Exotic
Viburnum lantanoides	Hobblebush	Not Listed	Not Listed	Not Listed	Green
Viburnum nudum	Northern Wild Raisin	Not Listed	Not Listed	Not Listed	Green
Viola sp.	N/A	N/A	N/A	N/A	N/A

Appendix E – Truro Heights Footprint, Plant Species Observed during 2012 Field Survey **Project # 12-4544**

Scientific Name	Common Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Abies balsamea	Balsam Fir	Not Listed	Not Listed	Not Listed	Green
Acer pensylvanicum	Striped Maple	Not Listed	Not Listed	Not Listed	Green
Acer rubrum	Red Maple	Not Listed	Not Listed	Not Listed	Green
Agrimonia striata	Woodland Agrimony	Not Listed	Not Listed	Not Listed	Green
Alnus incana	Speckled Alder	Not Listed	Not Listed	Not Listed	Green
Anaphalis margaritacea	Pearly Everlasting	Not Listed	Not Listed	Not Listed	Green
Aralia nudicaulis	Wild Sarsaparilla	Not Listed	Not Listed	Not Listed	Green
Arisaema triphyllum	Jack-in-the-pulpit	Not Listed	Not Listed	Not Listed	Green
Betula alleghaniensis	Yellow Birch	Not Listed	Not Listed	Not Listed	Green
Betula papyrifera	Paper Birch	Not Listed	Not Listed	Not Listed	Green
Betula populifolia	Gray Birch	Not Listed	Not Listed	Not Listed	Green
Brachyelytrum septentrionale	Bearded Short-Husk	Not Listed	Not Listed	Not Listed	Green
Calamagrostis canadensis	Bluejoint Reed Grass	Not Listed	Not Listed	Not Listed	Green
Carex crinita	Fringed Sedge	Not Listed	Not Listed	Not Listed	Green
Carex intumescens	Bladder Sedge	Not Listed	Not Listed	Not Listed	Green
Carex lurida	Sallow Sedge	Not Listed	Not Listed	Not Listed	Green
Carex trisperma	Three-seeded Sedge	Not Listed	Not Listed	Not Listed	Green
Clintonia borealis	Yellow Bluebead Lily	Not Listed	Not Listed	Not Listed	Green
Comptonia peregrina	Sweet-fern	Not Listed	Not Listed	Not Listed	Green
Coptis trifolia	Goldthread	Not Listed	Not Listed	Not Listed	Green
Cornus canadensis	Bunchberry	Not Listed	Not Listed	Not Listed	Green
Corylus cornuta	Beaked Hazel	Not Listed	Not Listed	Not Listed	Green
Danthonia compressa	Flattened Oat Grass	Not Listed	Not Listed	Not Listed	Green
Danthonia spicata	Poverty Oat Grass	Not Listed	Not Listed	Not Listed	Green
Dennstaedtia punctilobula	Eastern Hay-scented Fern	Not Listed	Not Listed	Not Listed	Green
Diervilla lonicera	Northern Bush Honeysuckle	Not Listed	Not Listed	Not Listed	Green
Doellingeria umbellata	Hairy Flat-top White Aster	Not Listed	Not Listed	Not Listed	Green
Dryopteris campyloptera	Mountain Wood Fern	Not Listed	Not Listed	Not Listed	Green
Dryopteris cristata	Crested Wood Fern	Not Listed	Not Listed	Not Listed	Green
Equisetum arvense	Field Horsetail	Not Listed	Not Listed	Not Listed	Green
Equisetum sylvaticum	Woodland Horsetail	Not Listed	Not Listed	Not Listed	Green
Eriophorum virginicum	Tawny Cottongrass	Not Listed	Not Listed	Not Listed	Green
Eupatorium perfoliatum	Common Boneset	Not Listed	Not Listed	Not Listed	Green

Scientific Name	Common Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Eurybia radula	Low Rough Aster	Not Listed	Not Listed	Not Listed	Green
Euthamia graminifolia	Grass-leaved Goldenrod	Not Listed	Not Listed	Not Listed	Green
Fagus grandifolia	American Beech	Not Listed	Not Listed	Not Listed	Green
Fragaria virginiana	Wild Strawberry	Not Listed	Not Listed	Not Listed	Green
Frangula alnus	Glossy Buckthorn	Not Listed	Not Listed	Not Listed	Exotic
Fraxinus americana	White Ash	Not Listed	Not Listed	Not Listed	Green
Galium palustre	Common Marsh Bedstraw	Not Listed	Not Listed	Not Listed	Green
Gaultheria hispidula	Creeping Snowberry	Not Listed	Not Listed	Not Listed	Green
Gaultheria procumbens	Eastern Teaberry	Not Listed	Not Listed	Not Listed	Green
Gaylussacia baccata	Black Huckleberry	Not Listed	Not Listed	Not Listed	Green
Geum macrophyllum	Large-leaved Avens	Not Listed	Not Listed	Not Listed	Green
Glyceria striata	Fowl Manna Grass	Not Listed	Not Listed	Not Listed	Green
Gymnocarpium dryopteris	Common Oak Fern	Not Listed	Not Listed	Not Listed	Green
Hydrocotyle americana	American Marsh Pennywort	Not Listed	Not Listed	Not Listed	Green
Hypericum canadense	Canada St. John's-wort	Not Listed	Not Listed	Not Listed	Green
Ilex verticillata	Common Winterberry	Not Listed	Not Listed	Not Listed	Green
Juncus canadensis	Canada Rush	Not Listed	Not Listed	Not Listed	Green
Juncus effusus	Soft Rush	Not Listed	Not Listed	Not Listed	Green
Kalmia angustifolia	Sheep Laurel	Not Listed	Not Listed	Not Listed	Green
Ledum groenlandicum	Common Labrador Tea	Not Listed	Not Listed	Not Listed	Green
Linnaea borealis	Twinflower	Not Listed	Not Listed	Not Listed	Green
Lonicera villosa	Mountain Fly Honeysuckle	Not Listed	Not Listed	Not Listed	Green
Lycopus uniflorus	Northern Water Horehound	Not Listed	Not Listed	Not Listed	Green
Lycopodium annotinum	Stiff Clubmoss	Not Listed	Not Listed	Not Listed	Green
Lycopodium dendroideum	Round-branched Tree-clubmoss	Not Listed	Not Listed	Not Listed	Green
Lysimachia terrestris	Swamp Yellow Loosestrife	Not Listed	Not Listed	Not Listed	Green
Maianthemum canadense	Wild Lily-of-the-valley	Not Listed	Not Listed	Not Listed	Green
Medeola virginiana	Indian Cucumber Root	Not Listed	Not Listed	Not Listed	Green
Mitchella repens	Partridgeberry	Not Listed	Not Listed	Not Listed	Green
Monotropa uniflora	Indian Pipe	Not Listed	Not Listed	Not Listed	Green
Nemopanthus mucronatus	Mountain Holly	Not Listed	Not Listed	Not Listed	Green
Oclemena acuminata	Whorled Wood Aster	Not Listed	Not Listed	Not Listed	Green
Onoclea sensibilis	Sensitive Fern	Not Listed	Not Listed	Not Listed	Green

Scientific Name	Common Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Osmunda cinnamomea	Cinnamon Fern	Not Listed	Not Listed	Not Listed	Green
Osmunda claytoniana	Interrupted Fern	Not Listed	Not Listed	Not Listed	Green
Oxalis montana	Common Wood Sorrel	Not Listed	Not Listed	Not Listed	Green
Packera schweinitziana	Schweinitz's Groundsel	Not Listed	Not Listed	Not Listed	Green
Picea mariana	Black Spruce	Not Listed	Not Listed	Not Listed	Green
Picea rubens	Red Spruce	Not Listed	Not Listed	Not Listed	Green
Pinus strobus	Eastern White Pine	Not Listed	Not Listed	Not Listed	Green
Polygonum sagittatum	Arrow-Leaved Tearthumb	Not Listed	Not Listed	Not Listed	Green
Polystichum acrostichoides	Christmas Fern	Not Listed	Not Listed	Not Listed	Green
Potamogeton epihydrus	Ribbon-leaved Pondweed	Not Listed	Not Listed	Not Listed	Green
Potentilla simplex	Old Field Cinquefoil	Not Listed	Not Listed	Not Listed	Green
Populus grandidentata	Large-toothed Aspen	Not Listed	Not Listed	Not Listed	Green
Populus tremuloides	Trembling Aspen	Not Listed	Not Listed	Not Listed	Green
Prenanthes trifoliolata	Three-leaved Rattlesnakeroot	Not Listed	Not Listed	Not Listed	Green
Prunella vulgaris	Common Self-heal	Not Listed	Not Listed	Not Listed	Green
Pteridium aquilinum	Bracken Fern	Not Listed	Not Listed	Not Listed	Green
Ranunculus recurvatus	Hooked Buttercup	Not Listed	Not Listed	Not Listed	Green
Ranunculus repens	Creeping Buttercup	Not Listed	Not Listed	Not Listed	Exotic
Ribes hirtellum	Smooth Gooseberry	Not Listed	Not Listed	Not Listed	Green
Rubus allegheniensis	Alleghaney Blackberry	Not Listed	Not Listed	Not Listed	Green
Rubus hispidus	Bristly Dewberry	Not Listed	Not Listed	Not Listed	Green
Rubus idaeus	Red Raspberry	Not Listed	Not Listed	Not Listed	Green
Rubus pubescens	Dwarf Red Raspberry	Not Listed	Not Listed	Not Listed	Green
Scirpus cyperinus	Common Woolly Bulrush	Not Listed	Not Listed	Not Listed	Green
Scutellaria lateriflora	Mad-dog Skullcap	Not Listed	Not Listed	Not Listed	Green
Solidago canadensis	Canada Goldenrod	Not Listed	Not Listed	Not Listed	Green
Solidago rugosa	Rough-stemmed Goldenrod	Not Listed	Not Listed	Not Listed	Green
Sparganium americanum	American Burreed	Not Listed	Not Listed	Not Listed	Green
Spiraea alba	White Meadowsweet	Not Listed	Not Listed	Not Listed	Green
Spiraea tomentosa	Steeplebush	Not Listed	Not Listed	Not Listed	Green
Symphyotrichum lateriflorum	Calico Aster	Not Listed	Not Listed	Not Listed	Green
Taraxacum officinale	Common Dandelion	Not Listed	Not Listed	Not Listed	Exotic
Thalictrum pubescens	Tall Meadow-rue	Not Listed	Not Listed	Not Listed	Green

Scientific Name	Common Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Thelypteris noveboracensis	New York Fern	Not Listed	Not Listed	Not Listed	Green
Trientalis borealis	Northern Starflower	Not Listed	Not Listed	Not Listed	Green
Tussilago farfara	Coltsfoot	Not Listed	Not Listed	Not Listed	Exotic
Typha latifolia	Broad-leaved Cattail	Not Listed	Not Listed	Not Listed	Green
Vaccinium myrtilloides	Velvet-leaved Blueberry	Not Listed	Not Listed	Not Listed	Green
Viburnum nudum	Northern Wild Raisin	Not Listed	Not Listed	Not Listed	Green

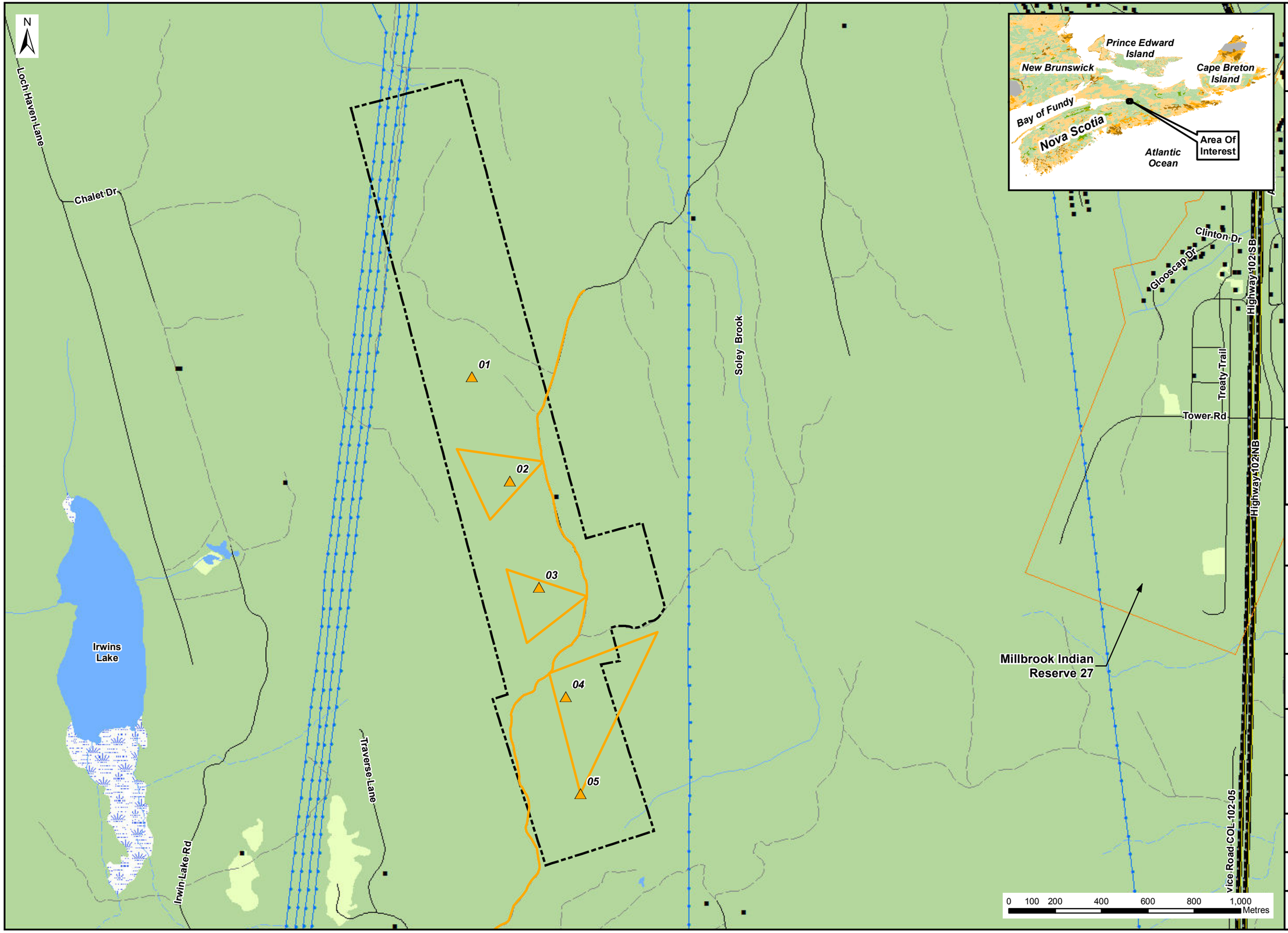
APPENDIX F
MOOSE SURVEY METHODOLOGY

Snow-tracking surveys are an effective method of evaluating the terrestrial fauna community in an area. Survey areas within the Project site were developed with the following considerations:

- Coverage of the Project site: Survey areas were designed to cover as much of the Project site as possible;
- Habitat: Multiple habitats were targeted including mature softwood forest, young hardwood forest, mixed wood forest, and wetlands;
- Development footprint: Survey areas focused on land incorporating the development footprint (access roads and turbines), to the extent possible; and
- Access: The Project site incorporates a large tract of land which is only accessible via a limited number of logging roads. Transects were designed to start and finish at existing logging roads/access roads.

Two pre-construction surveys were completed on February 11 and the March 26, 2013 using the snow-tracking methodology, and were conducted 1 to 7 days after a ≥ 10 cm snowfall. Survey areas were located across the Project site, and included a total of nine transects ranging in lengths from 329 m to 772 m, as well of 2.8 km of logging roads (Drawing F1). Surveys were conducted by a team of biologists with a demonstrable knowledge of mammalian animal sign and the ability to distinguish Mainland moose sign from that of other species. Logging roads were surveyed via snowmobile, while the remaining three transects were surveyed on-foot. All wildlife sign, primarily tracks but also including foraging sign, scat, and rubs, encountered during the surveys were identified to species, where possible. In addition, the locations of all noteworthy observations were recorded using GPS receivers capable of sub 5 m accuracy, with representative photos taken.

It should be noted that survey areas did not include the Tower Road Extension. Previous field studies revealed that habitats in this area consist primarily of extremely dense, softwood regeneration, along with large areas of windthrow. It is likely that Mainland moose would actively avoid this area due to travel hindrance created by the dense vegetation and downed woody debris. Furthermore, if Mainland moose were to occur in this area, the effectiveness of snow-tracking would be limited by lack of visibility in the thick brush.



Notes:

1. Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

Legend:

- Project Site Boundary
- Proposed Turbine
- Moose Survey Transects
- Building
- Major Roads and Highways
- Roads
- Access Roads / Trails
- Existing Transmission Lines
- Mapped Stream
- Indefinite Stream
- Water Bodies
- Mapped Wet Area
- Cleared Area

Moose Survey Transects

ESKASONI Corporate Division

MILLBROOK FIRST NATION

Community Wind Farms Inc.

juwi

Strum CONSULTING

Date: April 2013	Project #: 12-4328/12-4544
Scale: 1:15,000	Drawing #: 1
Drawn By: H. Serhan	
Checked By: M. Smith	

APPENDIX G
BIRD SURVEY METHODOLOGY AND RESULTS

Pre-construction (baseline) avian field surveys were completed to complement desktop information and to characterize the pre-construction (baseline) bird community at the Project site throughout the year. These surveys were carried out by an expert birder and were designed with the purpose of collecting data on species presence, abundance, and habitat usage at the Project site during the months coinciding with fall migration, spring migration, breeding season and the winter season. All field surveys were designed to conform to protocols outlined in the document "Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds" (CWS 2007).

Surveys were completed in February, April, May, June, September, October, and November of 2012 and February 2013. The following information was recorded at each survey location:

- Weather conditions (temperature, wind speed, cloud cover, and presence of precipitation);
- Date and time of day;
- Habitat description; and
- GPS coordinates of the survey location.

Surveys employed point count, area search, and stopover count methodologies depending on the season and target species. Regardless of survey methodology, the following elements were consistent among surveys:

- surveys were four hours in duration, commencing as close to sunrise as possible;
- species presence and abundance were recorded based on visual and acoustic observations;
- approximate distance to each bird was recorded using a scale of 0-50 m, 50-100 m and further than 100 m;
- behavioural patterns were noted to determine whether birds flying over the site would be within the future blade-swept area of a turbine; and
- survey locations during each survey were separated by a minimum distance of 300 m, whenever possible, to account for all present habitat types throughout the Project site.

REFERENCES

CWS (Canadian Wildlife Service). 2007. Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds. 33 pp.

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Common Name	Number Observed	Distance to Observer (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation				
February 21/2012	Mill/TH1	0474149E, 5022136N	Field, some standing mixedwoods	10 km/h NE	-14	Clear	None	7:44 AM	American Crow	18	50-100
...	...	...	...	...	...	...	...	...	Bald Eagle	1	50-100
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	6	50-100
...	...	...	...	...	...	...	...	...	Common Raven	6	50-100
...	...	...	...	...	...	...	...	...	European Starling	27	50-100
...	...	...	...	...	...	...	...	...	Herring Gull	14	50-100
...	...	...	...	...	...	...	...	...	Red-breasted Nuthatch	2	50-100
...	...	...	...	...	...	...	...	...	Rock Pigeon	9	50-100
...	...	...	...	...	...	...	...	...	Snow Bunting	9	50-100
...	Mill/TH2	0473219E, 5019219N	Shrub hardwoods, high proportion of yellow birch	10 km/h NE	-14	Clear	None	8:14 AM	American Crow	4	50-100
...	...	...	...	...	...	...	...	...	American Goldfinch	20	0-50
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	12	0-50
...	...	...	...	...	...	...	...	...	Blue Jay	8	50-100
...	...	...	...	...	...	...	...	...	Common Raven	1	100+
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	8	50-100
...	...	...	...	...	...	...	...	...	Mourning Dove	2	FO
...	...	...	...	...	...	...	...	...	Red-breasted Nuthatch	2	50-100
...	...	...	...	...	...	...	...	...	White-winged Crossbill	4	0-50
...	Mill/TH3	0473332E, 5018951N	Young hardwood	10 km/h NE	-14	Clear	None	8:27 AM	Blue Jay	1	50-100
...	...	...	...	...	...	...	...	...	Boreal Chickadee	2	0-50
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	6	FO
...	...	...	...	...	...	...	...	...	White-breasted Nuthatch	2	50-100
...	Mill/TH4	0473341E, 5018660N	Young hardwood	10 km/h NE	-14	Clear	None	8:39 AM	American Goldfinch	16	50-100
...	...	...	...	...	...	...	...	...	Blue Jay	2	50-100
...	...	...	...	...	...	...	...	...	Common Raven	2	100+
...	...	...	...	...	...	...	...	...	Pine Siskin	8	FO
...	...	...	...	...	...	...	...	...	White-winged Crossbill	6	50-100
...	Mill/TH5	0473185E, 5018431N	Young mixed	10 km/h NE	-14	Clear	None	8:51 AM	American Crow	4	100+
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	16	0-50
...	...	...	...	...	...	...	...	...	Blue Jay	4	50-100
...	...	...	...	...	...	...	...	...	Common Raven	1	100+
...	...	...	...	...	...	...	...	...	Evening Grosbeak	1	FO
...	...	...	...	...	...	...	...	...	Gray Jay	2	0-50
...	Mill/TH6	0473155E, 5019500N	Young hardwood	10 km/h NE	-14	Clear	None	9:27 AM	Golden-crowned Kinglet	1	50-100
	...	...	...	...	...	...	...	...	Pine Siskin	1	50-100

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Common Name	Number Observed	Distance to Observer (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation				
...	Mill/TH7	0473243E, 5019782N	Young hardwood	10 km/h NE	-14	Clear	None	9:39 AM	Common Raven	1	100+
...	...	...	...	...	...	...	...	...	Pine Siskin	2	FO
...	Mill/TH8	0473319E, 5020050N	Young mixed	10 km/h NE	-14	Clear	None	9:49 AM	American Crow	4	50-100
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	4	100+
...	...	...	...	...	...	...	...	...	Blue Jay	2	100+
...	...	...	...	...	...	...	...	...	Common Raven	4	100+
...	...	...	...	...	...	...	...	...	Pine Siskin	2	FO
...	...	...	...	...	...	...	...	...	Red-breasted Nuthatch	1	100+
...	...	...	...	...	...	...	...	...	White-winged Crossbill	2	50-100
...	Mill/TH9	0472984E, 50119881N	Young mixed	10 km/h NE, gusting to 20 km/h	-10	Clear	None	10:12 AM	American Crow	1	100+
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	2	50-100
...	...	...	...	...	...	...	...	...	Gray Jay	1	50-100
...	...	...	...	...	...	...	...	...	Hairy Woodpecker	1	0-50
...	Mill/TH10	0472736E, 5019990N	Young mixed	10 km/h NE, gusting to 20 km/h	-10	Clear	None	10:28 AM	American Crow	2	100+
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+
...	...	...	...	...	...	...	...	...	Common Raven	2	0-50
...	...	...	...	...	...	...	...	...	Evening Grosbeak	1	FO
...	...	...	...	...	...	...	...	...	Pine Siskin	2	FO
...	...	...	...	...	...	...	...	...	White-winged Crossbill	6	FO
...	Mill/TH11	0472577E, 5020184N	Mid-aged mixed	10 km/h NE, gusting to 20 km/h	-10	Clear	None	10:49 AM	American Crow	2	100+
...	Mill/TH12	0472670E, 5020441N	Young hardwood	10 km/h NE, gusting to 20 km/h	-10	Clear	None	11:03 AM	American Crow	2	0-50
...	...	...	...	...	...	...	...	...	American Goldfinch	4	50-100
...	...	...	...	...	...	...	...	...	Common Raven	1	100+
...	...	...	...	...	...	...	...	...	Boreal Chickadee	2	0-50
February 11/2013	Mill/TH13	473105E, 5017743N	Young Mixedwood	10 km/h	5	Clear	None	7:58 AM	American Crow	1	100+
...	...	...	...	...	...	...	...	...	Barred Owl	1	100+
...	...	...	...	...	...	...	...	...	Common Raven	1	100+
...	...	...	...	...	...	...	...	...	Downy Woodpecker	2	50-100
...	Mill/TH14	473348E, 5017645N	Mixedwood	10km/h	6	Clear	None	8:19 AM	Black-capped Chickadee	2	50-100
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Common Name	Number Observed	Distance to Observer (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation				
...	...	...	...	...	...	...	...	...	Common Raven	1	100+
...	...	...	...	...	...	...	...	...	Downy Woodpecker	2	0-50
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	0-50
...	Mill/TH15	473096E, 5017936N	Young hardwood	10km/h	6	Clear	None	8:25 AM	American Crow	2	100+
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	2	0-50
...	Mill/TH16	473563E, 5017826N	Softwood/Stream	10km/h	6	Clear	None	8:49 AM	Black-capped Chickadee	3	100+
...	...	...	...	...	...	...	...	...	Blue Jay	2	100+
...	...	...	...	...	...	...	...	...	Hairy Woodpecker	1	50-100
...	...	...	...	...	...	...	...	...	Hairy Woodpecker	1	100+
...	Mill/TH17	473487E, 5018013N	Sugar maple mid-mature	10km/h	6	Clear	None	9:07 AM	Black-capped Chickadee	1	100+
...	...	...	...	...	...	...	...	...	Downy Woodpecker	1	100+
...	Mill/TH18	473389E, 5018413N	Mixedwood	10km/h	6	Clear	None	9:41 AM	None Observed	-	-
...	Mill/TH19	473488E, 5018282N	Regenerating Cutblock	10km/h	6	Clear	None	9:25 AM	None Observed	-	-
...	Mill/TH20	473275E, 5018249N	Regenerating Cutblock Fir dominated	10km/h	6	Clear	None	9:59 AM	Common Raven	1	50-100
...	...	...	...	...	...	...	...	...	Downy Woodpecker	1	100+
...	Mill/TH21	473287E, 5017963N	Windfall hardwood stand	10km/h	6	Clear	None	10:19 AM	American Crow	1	100+
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	2	100+
...	...	...	...	...	...	...	...	...	Blue Jay	2	0-50
...	...	...	...	...	...	...	...	...	Common Raven	1	100+
...	Mill/TH22	473039E, 5018225N	Young mixed wood	10km/h	5	Clear	None	10:42 AM	Black-capped Chickadee	2	50-100
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+
...	Mill/TH23	473158E, 5018392N	Young Hardwood	10km/h	5	Clear	None	10:52 AM	Downy Woodpecker	1	100+
...	Mill/TH24	473305E, 5018563N	Young Hardwood	10km/h	5	Clear	None	11:06 AM	Common Raven	4	100+
...	...	...	...	...	...	...	...	...	Common Redpoll	1	0-50
...	...	...	...	...	...	...	...	...	Downy Woodpecker	2	100+

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status	Number of Observations	Number of Individuals Observed
American Crow	*Corvus brachyrhynchos*	Not Listed	Not Listed	Not Listed	Green	11	41
American Goldfinch	*Spinus tristis*	Not Listed	Not Listed	Not Listed	Green	3	40
Bald Eagle	*Haliaeetus leucocephalus*	Not Listed	Not Listed	Not at Risk	Green	1	1
Barred Owl	*Strix varia*	Not Listed	Not Listed	Not Listed	Green	1	1
Black-capped Chickadee	*Poecile atricapillus*	Not Listed	Not Listed	Not Listed	Green	10	50
Blue Jay	*Cyanocitta cristata*	Not Listed	Not Listed	Not Listed	Green	10	24
Boreal Chickadee	*Poecile hudsonicus*	Not Listed	Not Listed	Not Listed	Yellow	2	4
Common Raven	*Corvus corax*	Not Listed	Not Listed	Not Listed	Green	13	26
Common Redpoll	*Acanthis flammea*	Not Listed	Not Listed	Not Listed	Green	1	1
Dark-eyed Junco	*Junco hyemalis*	Not Listed	Not Listed	Not Listed	Green	2	14
Downy Woodpecker	*Picoides pubescens*	Not Listed	Not Listed	Not Listed	Green	6	9
European Starling	*Sturnus vulgaris*	Not Listed	Not Listed	Not Listed	Exotic	1	27
Evening Grosbeak	*Coccothraustes vespertinus*	Not Listed	Not Listed	Not Listed	Green	2	2
Golden-crowned Kinglet	*Regulus satrapa*	Not Listed	Not Listed	Not Listed	Yellow	3	4
Gray Jay	*Perisoreus canadensis*	Not Listed	Not Listed	Not Listed	Yellow	2	3
Hairy Woodpecker	*Picoides villosus*	Not Listed	Not Listed	Not Listed	Green	3	3
Herring Gull	*Larus argentatus*	Not Listed	Not Listed	Not Listed	Green	1	14
Mourning Dove	*Zenaida macroura*	Not Listed	Not Listed	Not Listed	Green	1	2
Pine Siskin	*Spinus pinus*	Not Listed	Not Listed	Not Listed	Yellow	5	15
Red-breasted Nuthatch	*Sitta canadensis*	Not Listed	Not Listed	Not Listed	Green	3	5
Rock Pigeon	*Columba livia*	Not Listed	Not Listed	Not Listed	Exotic	1	9
Snow Bunting	*Plectrophenax nivalis*	Not Listed	Not Listed	Not Listed	Green	1	9
White-breasted Nuthatch	*Sitta carolinensis*	Not Listed	Not Listed	Not Listed	Green	1	2
White-winged Crossbill	*Loxia leucoptera*	Not Listed	Not Listed	Not Listed	Green	4	18

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
April 28/2012	Mill/TH2	0473219E, 5019219N	Shrub hardwoods, high proportion of yellow birch	40 km/h W	3	Overcast	None	9:00 AM	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	50-100	-
...	...	...	...	...	...	...	...	...	Purple Finch	1	0-50	-
...	Mill/TH3	0473332E, 5018951N	Young hardwood	40 km/h W	3	Overcast	None	9:20 AM	Black-capped Chickadee	2	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	100+	-
...	...	...	...	...	...	...	...	...	Pine Siskin	2	50-100	-
...	...	...	...	...	...	...	...	...	Purple Finch	1	50-100	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	100+	-
...	Mill/TH4	0473341E, 5018660N	Young hardwood	40 km/h W	4	Overcast	None	9:44 AM	American Crow	2	100+	-
...	...	...	...	...	...	...	...	...	Northern Flicker	1	100+	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	100+	-
...	Mill/TH5	0473185E, 5018431N	Young mixed	40 km/h W	4	Overcast	None	9:58 AM	Golden-crowned Kinglet	1	50-100	-
...	Mill/TH6	0473155E, 5019500N	Young hardwood	40 km/h W	3	Overcast	None	8:44 AM	American Robin	2	0-50	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	100+	-
...	Mill/TH7	0473243E, 5019782N	Young hardwood	40 km/h SE	2	Flurries	Flurries	6:54 AM	American Black Duck	1	0-50	-
...	...	...	...	...	...	...	...	...	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	0-50	-
...	...	...	...	...	...	...	...	...	Mallard	1	0-50	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	100+	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	1	0-50	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	2	50-100	-
...	Mill/TH8	0473319E, 5020050N	Young mixed	40 km/h SE	2	Flurries	Flurries	6:38 AM	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	American Robin	2	0-50	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	1	50-100	-
...	...	...	...	...	...	...	...	...	Mourning Dove	1	0-50	-
...	...	...	...	...	...	...	...	...	Purple Finch	1	0-50	-
...	Mill/TH9	0472984E, 50119881N	Young mixed	40 km/h W	2	Flurries	Flurries	7:15 AM	Common Raven	2	100+	-
...	...	...	...	...	...	...	...	...	Hermit Thrush	1	50-100	-
...	...	...	...	...	...	...	...	...	Northern Flicker	1	100+	-
...	...	...	...	...	...	...	...	...	Pileated Woodpecker	1	100+	-
...	...	...	...	...	...	...	...	...	Purple Finch	1	0-50	-

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	…	…	…	…	…	…	…	…	Ruffed Grouse	1	100+	-
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	50-100	-
…	Mill/TH10	0472736E, 5019990N	Young mixed	40 km/h W	2	Overcast	None	7:37 AM	American Goldfinch	4	50-100	-
…	…	…	…	…	…	…	…	…	American Robin	1	0-50	-
…	…	…	…	…	…	…	…	…	American Robin	1	50-100	-
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	2	0-50	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	0-50	1P
…	…	…	…	…	…	…	…	…	Common Raven	1	50-100	-
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	100+	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	2	0-50	-
…	…	…	…	…	…	…	…	…	Palm Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Pileated Woodpecker	1	50-100	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	0-50	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	100+	1P
…	…	…	…	…	…	…	…	…	Ruffed Grouse	1	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	0-50	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	100+	1P
…	Mill/TH11	0472577E, 5020184N	Mid-aged mixed	40 km/h W	2	Overcast	None	7:59 AM	American Robin	1	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	1	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	2	0-50	1P
…	…	…	…	…	…	…	…	…	Common Raven	1	FO NW	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	50-100	1P
…	…	…	…	…	…	…	…	…	Pine Siskin	2	0-50	1P
…	…	…	…	…	…	…	…	…	Purple Finch	3	0-50	1P
…	…	…	…	…	…	…	…	…	Song Sparrow	1	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	0-50	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	100+	1P
…	Mill/TH12	0472670E, 5020441N	Young hardwood	40 km/h W	2	Overcast	None	8:18 AM	Hermit Thrush	1	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	1	0-50	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	0-50	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	50-100	1P
…	…	…	…	…	…	…	…	…	Pine Siskin	2	0-50	1P
…	…	…	…	…	…	…	…	…	Purple Finch	4	50-100	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	1	0-50	1P
May 7/2012	Mill/TH8	0473319E, 5020050N	Young mixed	Calm	5	Overcast	Light showers	6:09 AM	American Crow	1	100+	1P
…	…	…	…	…	…	…	…	…	American Goldfinch	1	0-50	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	…	…	…	…	…	…	…	…	American Robin	3	0-50	1P
…	…	…	…	…	…	…	…	…	American Robin	4	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	6	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	0-50	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	50-100	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	50-100	1P
…	…	…	…	…	…	…	…	…	Common Raven	1	100+	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	0-50	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	100+	1P
…	…	…	…	…	…	…	…	…	Hairy Woodpecker	1	0-50	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	8	100+	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Pileated Woodpecker	1	50-100	1P
…	…	…	…	…	…	…	…	…	Winter Wren	2	100+	1P
…	Mill/TH7	0473243E, 5019782N	Young hardwood	Calm	5	Overcasat	Light showers	6:25 AM	American Crow	2	100+	1P
…	…	…	…	…	…	…	…	…	American Robin	2	0-50	1P
…	…	…	…	…	…	…	…	…	American Robin	4	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	7	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	2	0-50	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	100+	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	0-50	1P
…	…	…	…	…	…	…	…	…	Common Raven	1	100+	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	50-100	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	100+	1P
…	…	…	…	…	…	…	…	…	Downy Woodpecker	1	50-100	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	1	0-50	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	8	100+	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	0-50	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	50-100	1P
…	…	…	…	…	…	…	…	…	Red-breasted Nuthatch	1	100+	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	1	50-100	1P
…	…	…	…	…	…	…	…	…	Ruffed Grouse	1	50-100	1P
…	…	…	…	…	…	…	…	…	Swainson's Thrush	2	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	4	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	50-100	1P
…	…	…	…	…	…	…	…	…	Winter Wren	1	100+	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	0-50	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	100+	1P
…	Mill/TH9	0472984E, 50119881N	Young mixed	Calm	5	Overcaat	Light showers	6:48 AM	American Crow	2	100+	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	…	…	…	…	…	…	…	…	American Robin	3	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	6	100+	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	50-100	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	50-100	1P
…	…	…	…	…	…	…	…	…	Common Raven	1	100+	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	3	100+	1P
…	…	…	…	…	…	…	…	…	Mourning Dove	1	50-100	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	50-100	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Pine Siskin	3	0-50	1P
…	…	…	…	…	…	…	…	…	Ruffed Grouse	1	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	50-100	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	1	100+	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	50-100	1P
…	Mill/TH10	0472736E, 5019990N	Young mixed	Calm	6	Overcast	Very light showers	7:09 AM	American Crow	1	100+	1P
…	…	…	…	…	…	…	…	…	American Robin	5	0-50	1P
…	…	…	…	…	…	…	…	…	American Robin	7	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	7	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	50-100	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	100+	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	0-50	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	50-100	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	100+	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	100+	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	5	100+	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	50-100	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Pine Siskin	2	50-100	1P
…	…	…	…	…	…	…	…	…	Purple Finch	2	0-50	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	50-100	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	100+	1P
…	…	…	…	…	…	…	…	…	Ruffed Grouse	1	100+	1P
…	…	…	…	…	…	…	…	…	Swainson's Thrush	2	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	1	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	3	50-100	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	7	100+	1P
…	…	…	…	…	…	…	…	…	Winter Wren	1	100+	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	100+	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	Mill/TH11	0472577E, 5020184N	Mid-aged mixed	Calm	6	Overcast	Very light showers	7:31 AM	American Crow	1	100+	1P
…	…	…	…	…	…	…	…	…	American Goldfinch	2	0-50	1P
…	…	…	…	…	…	…	…	…	American Goldfinch	1	100+	1P
…	…	…	…	…	…	…	…	…	American Robin	4	0-50	1P
…	…	…	…	…	…	…	…	…	American Robin	5	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	8	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	100+	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	50-100	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	100+	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	2	100+	1P
…	…	…	…	…	…	…	…	…	Evening Grosbeak	1	0-50	1P
…	…	…	…	…	…	…	…	…	Hairy Woodpecker	2	50-100	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Palm Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	50-100	1P
…	…	…	…	…	…	…	…	…	Purple Finch	2	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	3	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	5	50-100	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	100+	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	100+	1P
…	Mill/TH12	0472670E, 5020441N	Young hardwood	Calm	7	Overcast	None	7:52 AM	American Robin	2	0-50	1P
…	…	…	…	…	…	…	…	…	American Crow	1	100+	1P
…	…	…	…	…	…	…	…	…	American Goldfinch	3	FO SW	1P
…	…	…	…	…	…	…	…	…	American Robin	6	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	5	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	3	0-50	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	50-100	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	50-100	1P
…	…	…	…	…	…	…	…	…	Common Raven	1	0-50	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	50-100	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	100+	1P
…	…	…	…	…	…	…	…	…	Evening Grosbeak	1	50-100	1P
…	…	…	…	…	…	…	…	…	Mourning Dove	1	50-100	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Palm Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Purple Finch	2	0-50	1P
…	…	…	…	…	…	…	…	…	Red-winged Blackbird	1	FO NW	1P
…	…	…	…	…	…	…	…	…	Ring-necked Pheasant	2	100+	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	1	50-100	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	…	…	…	…	…	…	…	…	Ruffed Grouse	1	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	4	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	3	50-100	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	1	100+	1P
…	…	…	…	…	…	…	…	…	Winter Wren	1	100+	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	100+	1P
…	Mill/TH6	0473155E, 5019500N	Young hardwood	Calm	7	Overcast	None	8:20 AM	American Crow	1	100+	1P
…	…	…	…	…	…	…	…	…	American Goldfinch	1	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	4	0-50	1P
…	…	…	…	…	…	…	…	…	American Robin	4	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	9	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	0-50	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	100+	1P
…	…	…	…	…	…	…	…	…	Common Grackle	1	FO NW	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	100+	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	1	0-50	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	5	100+	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Purple Finch	2	0-50	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	1	0-50	1P
…	…	…	…	…	…	…	…	…	Swainson's Thrush	1	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	5	50-100	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	100+	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	0-50	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	100+	1P
…	Mill/TH2	0473219E, 5019219N	Shrub hardwoods, high proportion of yellow birch	Calm	7	Overcast	None	8:39 AM	American Crow	2	100+	1P
…	…	…	…	…	…	…	…	…	American Goldfinch	2	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	5	0-50	1P
…	…	…	…	…	…	…	…	…	American Robin	5	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	2	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	50-100	1P
…	…	…	…	…	…	…	…	…	Blue Jay	2	50-100	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	50-100	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	100+	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	50-100	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	100+	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	…	…	…	…	…	…	…	…	Evening Grosbeak	1	0-50	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	1	50-100	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	4	100+	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Purple Finch	2	0-50	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	50-100	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	1	0-50	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	1	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	3	50-100	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	4	100+	1P
…	…	…	…	…	…	…	…	…	Winter Wren	1	100+	1P
…	Mill/TH3	0473332E, 5018951N	Young hardwood	Calm	8	Overcast	None	9:01 AM	American Goldfinch	1	0-50	1P
…	…	…	…	…	…	…	…	…	American Goldfinch	2	50-100	1P
…	…	…	…	…	…	…	…	…	American Goldfinch	2	100+	1P
…	…	…	…	…	…	…	…	…	American Robin	2	0-50	1P
…	…	…	…	…	…	…	…	…	American Robin	4	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	7	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	2	50-100	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	50-100	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	50-100	1P
…	…	…	…	…	…	…	…	…	Hairy Woodpecker	1	100+	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	5	100+	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	1	50-100	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	2	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	50-100	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	4	100+	1P
…	…	…	…	…	…	…	…	…	Winter Wren	1	100+	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	100+	1P
…	Mill/TH4	0473341E, 5018660N	Young hardwood	Calm	8	Overcast	None	9:31 AM	American Crow	1	100+	1P
…	…	…	…	…	…	…	…	…	American Robin	3	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	4	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	2	50-100	1P
…	…	…	…	…	…	…	…	…	Blue Jay	2	50-100	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	100+	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	2	0-50	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	3	50-100	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	…	…	…	…	…	…	…	…	Hermit Thrush	6	100+	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Pine Siskin	1	50-100	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	50-100	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	1	50-100	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	3	100+	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	0-50	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	100+	1P
…	Mill/TH5	0473185E, 5018431N	Young mixed	Calm	8	Overcast	None	9:46 AM	American Crow	1	100+	1P
…	…	…	…	…	…	…	…	…	American Robin	2	0-50	1P
…	…	…	…	…	…	…	…	…	American Robin	2	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	6	100+	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	100+	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	0-50	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	50-100	1P
…	…	…	…	…	…	…	…	…	Red-breasted Nuthatch	1	100+	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	1	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	10	0-50	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	0-50	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	100+	1P
May 21/2012	…	0473319E, 5020050N	Young mixed	10 km/h S	13	Clear	None	9:09 AM	American Crow	1	100+	1P
…	…	…	…	…	…	…	…	…	American Robin	4	0-50	1P
…	…	…	…	…	…	…	…	…	Black-throated Green Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Blue Jay	2	0-50	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	50-100	1P
…	…	…	…	…	…	…	…	…	Chestnut-sided Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	2	100+	1P
…	…	…	…	…	…	…	…	…	Least Flycatcher	1	0-50	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	1	0-50	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	1	100+	1P
…	…	…	…	…	…	…	…	…	Mourning Dove	2	50-100	1P
…	…	…	…	…	…	…	…	…	Northern Parula	1	0-50	1P
…	…	…	…	…	…	…	…	…	Ovenbird	1	50-100	1P
…	…	…	…	…	…	…	…	…	Ovenbird	1	100+	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	50-100	1P
…	…	…	…	…	…	…	…	…	Winter Wren	2	100+	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
...	Mill/TH7	0473243E, 5019782N	Young hardwood	10 km/h S	13	Clear	None	9:22 AM	American Crow	1	100+	1P
...	...	...	...	...	...	...	...	...	American Goldfinch	1	0-50	1P
...	...	...	...	...	...	...	...	...	American Robin	1	50-100	1P
...	...	...	...	...	...	...	...	...	American Robin	2	100+	1P
...	...	...	...	...	...	...	...	...	Black-and-white Warbler	1	0-50	1P
...	...	...	...	...	...	...	...	...	Black-and-white Warbler	1	100+	1P
...	...	...	...	...	...	...	...	...	Black-throated Green	1	0-50	1P
...	...	...	...	...	...	...	...	...	Black-throated Green	1	50-100	1P
...	...	...	...	...	...	...	...	...	Black-throated Green	1	100+	1P
...	...	...	...	...	...	...	...	...	Blue Jay	1	50-100	1P
...	...	...	...	...	...	...	...	...	Blue-headed Vireo	1	100+	1P
...	...	...	...	...	...	...	...	...	Hermit Thrush	2	100+	1P
...	...	...	...	...	...	...	...	...	Mourning Dove	1	100+	1P
...	...	...	...	...	...	...	...	...	Ovenbird	2	100+	1P
...	...	...	...	...	...	...	...	...	Purple Finch	2	50-100	1P
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	100+	1P
...	...	...	...	...	...	...	...	...	Yellow-bellied Flycatcher	1	50-100	1P
...	Mill/TH9	0472984E, 50119881N	Young mixed	10 km/h S	13	Clear	None	9:35 AM	American Crow	4	100+	1P
...	...	...	...	...	...	...	...	...	American Robin	2	0-50	1P
...	...	...	...	...	...	...	...	...	American Robin	2	50-100	1P
...	...	...	...	...	...	...	...	...	American Robin	3	100+	1P
...	...	...	...	...	...	...	...	...	Black-and-white Warbler	3	0-50	1P
...	...	...	...	...	...	...	...	...	Black-and-white Warbler	1	100+	1P
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	1	100+	1P
...	...	...	...	...	...	...	...	...	Black-throated Blue	1	50-100	1P
...	...	...	...	...	...	...	...	...	Black-throated Green	1	50-100	1P
...	...	...	...	...	...	...	...	...	Black-throated Green	1	100+	1P
...	...	...	...	...	...	...	...	...	Blue Jay	1	50-100	1P
...	...	...	...	...	...	...	...	...	Eastern Wood-Pewee	1	100+	1P
...	...	...	...	...	...	...	...	...	Hermit Thrush	2	0-50	1P
...	...	...	...	...	...	...	...	...	Hermit Thrush	4	100+	1P
...	...	...	...	...	...	...	...	...	Magnolia Warbler	1	0-50	1P
...	...	...	...	...	...	...	...	...	Magnolia Warbler	2	50-100	1P
...	...	...	...	...	...	...	...	...	Mourning Dove	1	50-100	1P
...	...	...	...	...	...	...	...	...	Northern Flicker	1	0-50	1P
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	100+	1P
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	1	0-50	1P
...	Mill/TH10	0472736E, 5019990N	Young mixed	10 km/h S	15	Clear	None	9:48 AM	American Crow	1	100+	1P
...	...	...	...	...	...	...	...	...	American Robin	4	0-50	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	…	…	…	…	…	…	…	…	American Robin	2	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	3	100+	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	4	0-50	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	2	50-100	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	1	100+	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	100+	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	2	50-100	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	100+	1P
…	…	…	…	…	…	…	…	…	Hermit Thrush	4	100+	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	3	50-100	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	2	100+	1P
…	…	…	…	…	…	…	…	…	Mourning Dove	1	100+	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Ovenbird	2	0-50	1P
…	…	…	…	…	…	…	…	…	Ovenbird	2	100+	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	50-100	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	1	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	100+	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	2	50-100	2P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	2	100+	2P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	50-100	2P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	100+	2P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	4	0-50	2P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	1	50-100	2P
…	…	…	…	…	…	…	…	…	Common Yellowthroat	1	50-100	2P
…	Mill/TH11	0472577E, 5020184N	Mid-aged mixed	10 km/h S	15	Clear	None	10:07 AM	American Goldfinch	6	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	2	50-100	2P
…	…	…	…	…	…	…	…	…	American Robin	3	100+	2P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	3	0-50	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	2	50-100	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	2	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	0-50	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	3	0-50	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	4	50-100	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	5	100+	1P
…	…	…	…	…	…	…	…	…	Blue Jay	2	50-100	2P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	50-100	2P
…	…	…	…	…	…	…	…	…	Common Yellowthroat	1	0-50	1P
…	…	…	…	…	…	…	…	…	Common Yellowthroat	1	50-100	1P
…	…	…	…	…	…	…	…	…	Eastern Wood-Pewee	1	100+	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	…	…	…	…	…	…	…	…	Hermit Thrush	3	100+	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	4	0-50	2P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	4	50-100	2P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	2	100+	2P
…	…	…	…	…	…	…	…	…	Mourning Dove	1	100+	1P
…	…	…	…	…	…	…	…	…	Northern Parula	1	50-100	2P
…	…	…	…	…	…	…	…	…	Northern Parula	1	100+	2P
…	…	…	…	…	…	…	…	…	Ovenbird	2	50-100	2P
…	…	…	…	…	…	…	…	…	Ovenbird	3	100+	2P
…	…	…	…	…	…	…	…	…	Pine Siskin	1	0-50	2P
…	…	…	…	…	…	…	…	…	Purple Finch	1	50-100	2P
…	…	…	…	…	…	…	…	…	Ruby-throated Hummingbird	2	0-50	2P
…	…	…	…	…	…	…	…	…	Swainson's Thrush	1	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	50-100	1P
…	…	…	…	…	…	…	…	…	Winter Wren	1	100+	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	0-50	2P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	100+	2P
…	Mill/TH12	0472670E, 5020441N	Young hardwood	10 km/h S	15	Clear	None	10:28 AM	Alder Flycatcher	2	0-50	1P
…	…	…	…	…	…	…	…	…	American Crow	1	50-100	1P
…	…	…	…	…	…	…	…	…	American Goldfinch	2	50-100	1P
…	…	…	…	…	…	…	…	…	American Redstart	1	0-50	1P
…	…	…	…	…	…	…	…	…	American Redstart	2	50-100	1P
…	…	…	…	…	…	…	…	…	American Redstart	1	100+	1P
…	…	…	…	…	…	…	…	…	American Robin	2	100+	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	2	0-50	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	2	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	50-100	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	7	0-50	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	4	50-100	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	5	100+	1P
…	…	…	…	…	…	…	…	…	Least Flycatcher	1	50-100	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	3	50-100	1P
…	…	…	…	…	…	…	…	…	Mourning Dove	1	100+	1P
…	…	…	…	…	…	…	…	…	Ovenbird	2	100+	1P
…	…	…	…	…	…	…	…	…	Red-eyed Vireo	1	0-50	1P
…	…	…	…	…	…	…	…	…	Ruby-throated	1	0-50	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	1	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-bellied Flycatcher	1	100+	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	Mill/TH6	0473155E, 5019500N	Young hardwood	10 km/h S	15	Clear	None	10:50 AM	American Redstart	2	0-50	1P
…	…	…	…	…	…	…	…	…	American Redstart	1	100+	1P
…	…	…	…	…	…	…	…	…	American Robin	1	0-50	1P
…	…	…	…	…	…	…	…	…	American Robin	1	50-100	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	2	0-50	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	2	50-100	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	1	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	2	50-100	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	6	0-50	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	4	50-100	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	4	100+	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	100+	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	50-100	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	100+	1P
…	…	…	…	…	…	…	…	…	Dark-eyed Junco	1	0-50	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	3	0-50	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	4	50-100	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	2	100+	1P
…	…	…	…	…	…	…	…	…	Mourning Dove	1	100+	1P
…	…	…	…	…	…	…	…	…	Nashville Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Ovenbird	1	50-100	1P
…	…	…	…	…	…	…	…	…	Ovenbird	2	100+	1P
…	…	…	…	…	…	…	…	…	Purple Finch	1	0-50	1P
…	…	…	…	…	…	…	…	…	Ruby-crowned Kinglet	1	0-50	1P
…	…	…	…	…	…	…	…	…	Ruffed Grouse	1	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	2	0-50	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Yellow-rumped Warbler	1	100+	1P
…	Mill/TH2	0473219E, 5019219N	Shrub hardwoods, high proportion of yellow birch	10 km/h S	15	Clear	None	11:04 AM	American Crow	1	100+	1P
…	…	…	…	…	…	…	…	…	American Redstart	2	50-100	1P
…	…	…	…	…	…	…	…	…	American Robin	2	0-50	1P
…	…	…	…	…	…	…	…	…	American Robin	2	100+	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	1	0-50	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	2	50-100	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	1	100+	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
...	...	...	...	...	...	...	...	...	Black-billed Cuckoo	1	50-100	1P
...	...	...	...	...	...	...	...	...	Black-throated Green Warbler	3	0-50	1P
...	...	...	...	...	...	...	...	...	Black-throated Green	6	50-100	1P
...	...	...	...	...	...	...	...	...	Blue-headed Vireo	1	0-50	1P
...	...	...	...	...	...	...	...	...	Blue-headed Vireo	2	50-100	1P
...	...	...	...	...	...	...	...	...	Blue-headed Vireo	2	100+	1P
...	...	...	...	...	...	...	...	...	Magnolia Warbler	3	0-50	1P
...	...	...	...	...	...	...	...	...	Magnolia Warbler	4	50-100	1P
...	...	...	...	...	...	...	...	...	Magnolia Warbler	2	100+	1P
...	...	...	...	...	...	...	...	...	Northern Parula	1	50-100	1P
...	...	...	...	...	...	...	...	...	Ovenbird	1	50-100	1P
...	...	...	...	...	...	...	...	...	Ovenbird	2	100+	1P
...	...	...	...	...	...	...	...	...	Purple Finch	1	0-50	1P
...	...	...	...	...	...	...	...	...	Purple Finch	4	50-100	1P
...	...	...	...	...	...	...	...	...	Red-eyed Vireo	1	50-100	1P
...	Mill/TH3	0473332E, 5018951N	Young hardwood	10 km/h S	15	Clear	None	11:17 AM	American Goldfinch	1	50-100	1P
...	...	...	...	...	...	...	...	...	Black-and-white Warbler	1	50-100	1P
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	1	50-100	1P
...	...	...	...	...	...	...	...	...	Black-throated Green	4	100+	1P
...	...	...	...	...	...	...	...	...	Blue-headed Vireo	2	100+	1P
...	...	...	...	...	...	...	...	...	Magnolia Warbler	1	0-50	1P
...	...	...	...	...	...	...	...	...	Magnolia Warbler	2	100+	1P
...	...	...	...	...	...	...	...	...	Northern Flicker	1	100+	1P
...	...	...	...	...	...	...	...	...	Ovenbird	1	0-50	1P
...	...	...	...	...	...	...	...	...	Ovenbird	2	100+	1P
...	...	...	...	...	...	...	...	...	Purple Finch	1	50-100	1P
...	Mill/TH4	0473341E, 5018660N	Young hardwood	10 km/h S	15	Clear	None	11:33 AM	American Crow	1	100+	1P
...	...	...	...	...	...	...	...	...	American Goldfinch	2	50-100	1P
...	...	...	...	...	...	...	...	...	American Robin	1	50-100	1P
...	...	...	...	...	...	...	...	...	American Robin	1	100+	1P
...	...	...	...	...	...	...	...	...	Black-and-white Warbler	1	50-100	1P
...	...	...	...	...	...	...	...	...	Black-and-white Warbler	2	100+	1P
...	...	...	...	...	...	...	...	...	Black-throated Green	2	50-100	1P
...	...	...	...	...	...	...	...	...	Black-throated Green	4	100+	1P
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	1P
...	...	...	...	...	...	...	...	...	Blue-headed Vireo	1	50-100	1P
...	...	...	...	...	...	...	...	...	Blue-headed Vireo	1	100+	1P
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	1	100+	1P

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
…	…	…	…	…	…	…	…	…	Hermit Thrush	1	100+	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	3	100+	1P
…	…	…	…	…	…	…	…	…	Northern Parula	1	100+	1P
…	…	…	…	…	…	…	…	…	Ovenbird	1	0-50	1P
…	…	…	…	…	…	…	…	…	Ovenbird	2	50-100	1P
…	…	…	…	…	…	…	…	…	Ovenbird	4	100+	1P
…	…	…	…	…	…	…	…	…	Pine Siskin	1	100+	1P
…	…	…	…	…	…	…	…	…	Ruffed Grouse	1	100+	1P
…	…	…	…	…	…	…	…	…	White-throated Sparrow	2	50-100	1P
…	Mill/TH5	0473185E, 5018431N	Young mixed	10 km/h S	16	Clear	None	11:50 AM	American Crow	1	100+	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	1	50-100	1P
…	…	…	…	…	…	…	…	…	Black-and-white Warbler	1	100+	1P
…	…	…	…	…	…	…	…	…	Black-capped Chickadee	1	100+	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	1	50-100	1P
…	…	…	…	…	…	…	…	…	Black-throated Green	2	100+	1P
…	…	…	…	…	…	…	…	…	Blue Jay	1	100+	1P
…	…	…	…	…	…	…	…	…	Blue-headed Vireo	1	50-100	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	1	0-50	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	2	50-100	1P
…	…	…	…	…	…	…	…	…	Magnolia Warbler	3	100+	1P
…	…	…	…	…	…	…	…	…	Northern Flicker	1	100+	1P
…	…	…	…	…	…	…	…	…	Northern Parula	1	100+	1P
…	…	…	…	…	…	…	…	…	Ovenbird	1	50-100	1P
…	…	…	…	…	…	…	…	…	Ovenbird	2	100+	1P

Table G4: Spring Bird Survey Results Summary, Millbrook/Truro Heights Community Wind Projects ***Project # 12-4328/12-4544***

Common Name	Scientific Name	NSDNR Status	COSEWIC Status	SARA Status	NSESA Status	Number of Times Observed	Number of Individuals Observed
Alder Flycatcher	*Empidonax alnorum*	Green	Not Listed	Not Listed	Not Listed	1	2
American Black Duck	*Anas rubripes*	Green	Not Listed	Not Listed	Not Listed	1	1
American Crow	*Corvus brachyrhynchos*	Green	Not Listed	Not Listed	Not Listed	22	29
American Goldfinch	*Spinus tristis*	Green	Not Listed	Not Listed	Not Listed	15	31
American Redstart	*Setophaga ruticilla*	Green	Not Listed	Not Listed	Not Listed	6	9
American Robin	*Turdus migratorius*	Green	Not Listed	Not Listed	Not Listed	56	190
Black-and-white Warbler	*Mniotilta varia*	Green	Not Listed	Not Listed	Not Listed	23	37
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Red	Not Listed	Not Listed	Not Listed	1	1
Black-capped Chickadee	*Poecile atricapillus*	Green	Not Listed	Not Listed	Not Listed	24	33
Black-throated Blue Warbler	*Dendroica caerulescens*	Green	Not Listed	Not Listed	Not Listed	1	1
Black-throated Green Warbler	*Dendroica virens*	Green	Not Listed	Not Listed	Not Listed	25	77
Blue Jay	*Cyanocitta cristata*	Green	Not Listed	Not Listed	Not Listed	22	27
Blue-headed Vireo	*Vireo solitarius*	Green	Not Listed	Not Listed	Not Listed	23	27
Chestnut-sided Warbler	*Dendroica pensylvanica*	Green	Not Listed	Not Listed	Not Listed	1	1
Common Grackle	*Quiscalus quiscula*	Green	Not Listed	Not Listed	Not Listed	1	1
Common Raven	*Corvus corax*	Green	Not Listed	Not Listed	Not Listed	7	8
Common Yellowthroat	*Geothlypis trichas*	Green	Not Listed	Not Listed	Not Listed	3	3
Dark-eyed Junco	*Junco hyemalis*	Green	Not Listed	Not Listed	Not Listed	17	18
Downy Woodpecker	*Picoides pubescens*	Green	Not Listed	Not Listed	Not Listed	1	1
Eastern Wood-Pewee	*Contopus virens*	Yellow	Not Listed	Not Listed	Not Listed	2	2
Evening Grosbeak	*Coccothraustes vespertinus*	Green	Not Listed	Not Listed	Not Listed	3	3
Golden-crowned Kinglet	*Regulus satrapa*	Yellow	Not Listed	Not Listed	Not Listed	2	2
Hairy Woodpecker	*Picoides villosus*	Green	Not Listed	Not Listed	Not Listed	3	4
Hermit Thrush	*Catharus guttatus*	Green	Not Listed	Not Listed	Not Listed	23	74
Least Flycatcher	*Empidonax minimus*	Green	Not Listed	Not Listed	Not Listed	2	2
Magnolia Warbler	*Dendroica magnolia*	Green	Not Listed	Not Listed	Not Listed	23	54
Mallard	*Anas platyrhynchos*	Green	Not Listed	Not Listed	Not Listed	1	1
Mourning Dove	*Zenaida macroura*	Green	Not Listed	Not Listed	Not Listed	10	11
Nashville Warbler	*Vermivora ruficapilla*	Green	Not Listed	Not Listed	Not Listed	1	1
Northern Flicker	*Colaptes auratus*	Green	Not Listed	Not Listed	Not Listed	21	21
Northern Parula	*Parula americana*	Green	Not Listed	Not Listed	Not Listed	6	6
Ovenbird	*Seiurus aurocapilla*	Green	Not Listed	Not Listed	Not Listed	19	34
Palm Warbler	*Dendroica palmarum*	Green	Not Listed	Not Listed	Not Listed	3	3
Pileated Woodpecker	*Dryocopus pileatus*	Green	Not Listed	Not Listed	Not Listed	3	3
Pine Siskin	*Spinus pinus*	Yellow	Not Listed	Not Listed	Not Listed	8	14
Purple Finch	*Carpodacus purpureus*	Green	Not Listed	Not Listed	Not Listed	29	43
Red-breasted Nuthatch	*Sitta canadensis*	Green	Not Listed	Not Listed	Not Listed	2	2
Red-eyed Vireo	*Vireo olivaceus*	Green	Not Listed	Not Listed	Not Listed	2	2
Red-winged Blackbird	*Agelaius phoeniceus*	Green	Not Listed	Not Listed	Not Listed	1	1
Ring-necked Pheasant	*Phasianus colchicus*	Exotic	Not Listed	Not Listed	Not Listed	1	2
Ruby-crowned Kinglet	*Regulus calendula*	Yellow	Not Listed	Not Listed	Not Listed	11	12
Ruby-throated Hummingbird	*Archilochus colubris*	Green	Not Listed	Not Listed	Not Listed	2	3
Ruffed Grouse	*Bonasa umbellus*	Green	Not Listed	Not Listed	Not Listed	14	14
Song Sparrow	*Melospiza melodia*	Green	Not Listed	Not Listed	Not Listed	1	1
Swainson's Thrush	*Catharus ustulatus*	Green	Not Listed	Not Listed	Not Listed	4	6
White-throated Sparrow	*Zonotrichia albicollis*	Green	Not Listed	Not Listed	Not Listed	34	96
Winter Wren	*Troglodytes troglodytes*	Green	Not Listed	Not Listed	Not Listed	8	10
Yellow-bellied Flycatcher	*Empidonax flaviventris*	Yellow	Not Listed	Not Listed	Not Listed	2	2
Yellow-rumped Warbler	*Dendroica coronata*	Green	Not Listed	Not Listed	Not Listed	34	46

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
June 8/2012	Mill/TH8	0473319E, 5020050N	Young mixed	Calm	9	Overcast/Fog	None	6:23AM	American Crow	1	100+	
									American Goldfinch	4	0-50	
									American Redstart	1	0-50	
									American Redstart	1	50-100	
									American Robin	2	0-50	
									American Robin	2	50-100	
									American Robin	4	100+	
									Black-and-white Warbler	1	0-50	
									Black-capped Chickadee	2	0-50	1P
									Black-throated Green Warbler	2	0-50	
									Black-throated Green Warbler	2	50-100	
									Common Yellowthroat	1	0-50	
									Dark-eyed Junco	1	0-50	
									Least Flycatcher	3	0-50	
									Magnolia Warbler	1	0-50	
									Magnolia Warbler	1	50-100	
									Mourning Dove	4	0-50	2 Adult, 2 young
									Northern Flicker	2	0-50	1P
									Ovenbird	1	0-50	
									Red Crossbill	1	100+	
									Red-eyed Vireo	2	0-50	
									Red-eyed Vireo	1	50-100	
									Red-eyed Vireo	1	100+	
									Swainson's Thrush	1	0-50	
									Swainson's Thrush	1	50-100	
									White-throated Sparrow	2	0-50	1P
									White-throated Sparrow	2	50-100	1P
									Winter Wren	1	0-50	
									Winter Wren	1	100+	
	Mill/TH7	0473243E, 5019782N	Young hardwood	10 km/h NE	9	Overcast/Fog	None	6:43AM	American Goldfinch	2	0-50	
									American Redstart	4	0-50	
									American Redstart	2	50-100	
									American Robin	6	0-50	
									American Robin	4	50-100	
									American Robin	2	100+	
									Black-and-white Warbler	1	0-50	
									Black-throated Green Warbler	2	0-50	
									Magnolia Warbler	1	0-50	
									Magnolia Warbler	1	50-100	
									Mourning Dove	1	0-50	
									Northern Flicker	3	0-50	Family
									Ovenbird	4	0-50	
									Ovenbird	1	50-100	
									Red-eyed Vireo	2	0-50	
									Red-eyed Vireo	2	50-100	
									Ruffed Grouse	1	100+	
	Mill/TH9	0472984E, 50119881N	Young mixed	Calm	9	Overcast/Fog	None	7:14AM	American Crow	2	100+	

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
									American Goldfinch	1	0-50	
									American Redstart	2	0-50	
									American Redstart	2	50-100	
									American Robin	2	0-50	
									American Robin	3	50-100	
									American Robin	3	100+	
									American Woodcock	1	0-50	
									Black-throated Green Warbler	2	0-50	
									Blue Jay	1	50-100	
									Hermit Thrush	1	0-50	
									Mourning Dove	1	0-50	
									Northern Flicker	3	0-50	Family
									Ovenbird	2	0-50	
									Ovenbird	1	100+	
									Purple Finch	1	0-50	
									Red-eyed Vireo	2	0-50	
									Red-eyed Vireo	2	50-100	
									Red-eyed Vireo	1	100+	
									Winter Wren	1	100+	
	Mill/TH10	0472736E, 5019990N	Young mixed	Calm	11	Overcast/Fog	None	7:40AM	Alder Flycatcher	4	0-50	
									American Crow	1	100+	
									American Goldfinch	2	0-50	
									American Redstart	2	0-50	
									American Redstart	4	50-100	
									American Robin	4	0-50	
									American Robin	2	50-100	
									American Robin	3	100+	
									Black-and-white Warbler	1	0-50	
									Black-and-white Warbler	1	100+	
									Black-capped Chickadee	2	0-50	1P
									Black-throated Green Warbler	2	0-50	
									Black-throated Green Warbler	3	50-100	
									Blue-headed Vireo	1	0-50	
									Blue-headed Vireo	1	100+	
									Hermit Thrush	5	50-100	
									Least Flycatcher	1	50-100	
									Magnolia Warbler	1	0-50	
									Magnolia Warbler	1	100+	
									Mourning Dove	2	0-50	
									Nashville Warbler	1	0-50	
									Ovenbird	2	0-50	
									Ovenbird	1	50-100	
									Red-eyed Vireo	2	0-50	
									Red-eyed Vireo	3	50-100	
									Ring-necked Pheasant	1	100+	
									Swainson's Thrush	4	50-100	
									White-throated Sparrow	2	0-50	1P
									White-throated Sparrow	2	50-100	
									Yellow-bellied Flycatcher	3	0-50	

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
	Mill/TH11	0472577E, 5020184N	Mid-aged mixed	Calm	11	Overcast/Fog	None	8:08AM	American Crow	1	0-50	
									American Goldfinch	4	0-50	
									American Robin	3	0-50	
									American Robin	5	50-100	
									Black-and-white Warbler	2	0-50	
									Black-and-white Warbler	1	100+	
									Blue Jay	1	0-50	
									Chestnut-sided Warbler	1	0-50	
									Common Yellowthroat	1	0-50	
									Common Yellowthroat	1	100+	
									Eastern Wood-Pewee	2	0-50	
									Least Flycatcher	1	100+	
									Mourning Dove	1	0-50	
									Northern Flicker	1	50-100	
									Red-eyed Vireo	1	0-50	
									Red-eyed Vireo	2	50-100	
									Red-tailed Hawk	1	100+	
									Ruffed Grouse	1	100+	
									Song Sparrow	1	0-50	
									Swainson's Thrush	3	0-50	
									Swainson's Thrush	2	50-100	
									Swainson's Thrush	1	100+	
									Tennessee Warbler	1	50-100	
									Yellow-bellied Flycatcher	4	0-50	
	Mill/TH12	0472670E, 5020441N	Young hardwood	Calm	11	Overcast/Fog	None	8:27AM	American Crow	1	50-100	
									American Redstart	6	0-50	
									American Redstart	2	50-100	
									American Robin	7	0-50	
									Black-capped Chickadee	1	0-50	
									Black-throated Green Warbler	1	0-50	
									Black-throated Green Warbler	2	50-100	
									Chestnut-sided Warbler	1	0-50	
									Chipping Sparrow	1	0-50	
									Hermit Thrush	1	0-50	
									Hermit Thrush	2	50-100	
									Hermit Thrush	5	100+	
									Mourning Dove	1	50-100	
									Ovenbird	1	0-50	
									Ovenbird	1	100+	
									Purple Finch	1	0-50	
									Red-eyed Vireo	2	0-50	
									Red-eyed Vireo	2	50-100	
									Red-eyed Vireo	1	100+	
									Red-tailed Hawk	1	0-50	
									Swainson's Thrush	9	0-50	
									Swainson's Thrush	2	50-100	
									Tennessee Warbler	1	0-50	
									Yellow Warbler	1	0-50	

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
	Mill/TH6	0473155E, 5019500N	Young hardwood	Calm	11	Cloudy	None	8:58AM	American Goldfinch	2	0-50	
									American Goldfinch	4	50-100	
									American Redstart	3	0-50	
									American Redstart	1	50-100	
									Black-and-white Warbler	1	0-50	
									Black-and-white Warbler	1	100+	
									Black-throated Green Warbler	2	0-50	
									Black-throated Green Warbler	4	50-100	
									Black-throated Green Warbler	4	100+	
									Blue Jay	1	100+	
									Common Yellowthroat	1	0-50	
									Common Yellowthroat	1	50-100	
									Dark-eyed Junco	4	0-50	2P
									Mourning Dove	3	0-50	Family
									Nashville Warbler	1	50-100	
									Northern Flicker	1	0-50	
									Northern Flicker	1	100+	
									Ovenbird	1	50-100	
									Ovenbird	1	100+	
									Purple Finch	2	0-50	
									Red-eyed Vireo	3	0-50	
									Red-eyed Vireo	3	50-100	
									Red-eyed Vireo	1	100+	
									Veery	2	50-100	
	Mill/TH2	0473219E, 5019219N	Shrub hardwoods, high proportion of yellow birch	Calm	12	Sunny	None	9:14AM	American Crow	1	100+	
									American Goldfinch	2	0-50	1P
									American Goldfinch	2	50-100	
									American Robin	3	0-50	
									American Robin	4	50-100	
									American Robin	2	100+	
									Black-and-white Warbler	1	0-50	
									Black-and-white Warbler	2	50-100	
									Black-throated Green Warbler	2	0-50	
									Black-throated Green Warbler	3	50-100	
									Common Yellowthroat	2	0-50	
									Common Yellowthroat	1	50-100	
									Hairy Woodpecker	2	0-50	
									Mourning Dove	1	0-50	
									Northern Flicker	1	50-100	
									Northern Parula	1	0-50	
									Northern Parula	2	50-100	
									Red-eyed Vireo	4	0-50	
									Red-eyed Vireo	5	50-100	
									Swainson's Thrush	4	50-100	
									Swainson's Thrush	4	100+	

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
	Mill/TH3	0473332E, 5018951N	Young hardwood	Calm	12	Sunny	None	9:41AM	American Crow	1	50-100	
									American Goldfinch	1	0-50	
									American Robin	1	0-50	
									American Robin	3	50-100	
									American Robin	2	100+	
									Black-and-white Warbler	2	0-50	
									Black-and-white Warbler	3	50-100	
									Black-capped Chickadee	2	0-50	1P
									Black-throated Green Warbler	3	0-50	
									Black-throated Green Warbler	2	50-100	
									Blue-headed Vireo	2	0-50	
									Magnolia Warbler	2	0-50	
									Magnolia Warbler	2	50-100	
									Mourning Dove	1	0-50	
									Northern Flicker	1	100+	
									Ovenbird	1	0-50	
									Ovenbird	2	50-100	
									Purple Finch	1	0-50	
									Red-breasted Nuthatch	1	0-50	
									Red-eyed Vireo	3	0-50	
									Red-eyed Vireo	3	50-100	
									Sharp-shinned Hawk	1	0-50	
									Swainson's Thrush	3	100+	
									Winter Wren	1	100+	
	Mill/TH4	0473341E, 5018660N	Young hardwood	Calm	14	Sunny	None	10:11AM	American Crow	2	100+	
									American Robin	2	0-50	
									American Robin	3	50-100	
									American Robin	1	100+	
									Black-throated Green Warbler	1	0-50	
									Black-throated Green Warbler	2	50-100	
									Black-throated Green Warbler	2	100+	
									Blue Jay	1	100+	
									Magnolia Warbler	1	50-100	
									Magnolia Warbler	1	100+	
									Mourning Dove	1	100+	
									Ovenbird	1	0-50	
									Ovenbird	1	50-100	
									Ovenbird	1	100+	
									Red-eyed Vireo	2	0-50	
									Red-eyed Vireo	3	50-100	
									Ruby-crowned Kinglet	1	100+	
									Ruffed Grouse	1	100+	
									Swainson's Thrush	1	0-50	
									Swainson's Thrush	2	100+	
									Yellow-bellied Flycatcher	1	50-100	
June 20/2012	Mill/TH8	0473319E, 5020050N	Young mixed	Calm	13	Overcast	None	4:52AM	American Robin	8	0-50	
									American Robin	4	50-100	

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
									American Robin	7	100+	
									Black-and-white Warbler	1	0-50	
									Black-throated Green Warbler	1	50-100	
									Black-throated Green Warbler	1	100+	
									Common Loon	1	100+	
									Common Nighthawk	1	F/O SE	
									Common Yellowthroat	1	0-50	
									Common Yellowthroat	1	50-100	
									Hermit Thrush	5	50-100	
									Hermit Thrush	6	100+	
									Least Flycatcher	2	0-50	
									Magnolia Warbler	1	0-50	
									Magnolia Warbler	1	100+	
									Mourning Dove	2	0-50	
									Nashville Warbler	1	0-50	
									Purple Finch	1	0-50	
									Red-eyed Vireo	1	0-50	
									Red-eyed Vireo	2	100+	
									Swainson's Thrush	2	0-50	
									Swainson's Thrush	4	50-100	
									Swainson's Thrush	1	100+	
									White-throated Sparrow	2	0-50	1P
									White-throated Sparrow	4	50-100	
									Yellow Warbler	1	100+	
									Yellow-rumped Warbler	1	100+	
	Mill/TH7	0473243E, 5019782N	Young hardwood	Calm	13	Overcast	None	5:10AM	American Redstart	1	0-50	
									American Redstart	1	50-100	
									American Robin	6	0-50	
									American Robin	6	50-100	
									American Robin	7	100+	
									Black-and-white Warbler	1	0-50	
									Black-capped Chickadee	1	50-100	
									Black-throated Green Warbler	1	50-100	
									Black-throated Green Warbler	1	100+	
									Common Yellowthroat	2	0-50	
									Common Yellowthroat	1	50-100	
									Dark-eyed Junco	2	0-50	1P
									Magnolia Warbler	2	0-50	
									Mourning Dove	3	0-50	Family
									Northern Parula	1	0-50	
									Ovenbird	1	50-100	
									Red-eyed Vireo	2	0-50	
									Red-eyed Vireo	1	100+	
									Rose-breasted Grosbeak	2	0-50	
									Ruffed Grouse	1	100+	
									White-throated Sparrow	1	0-50	
									White-throated Sparrow	2	50-100	
									Winter Wren	1	100+	

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
	Mill/TH9	0472984E, 50119881N	Young mixed	Calm	13	Overcast	None	5:37AM	American Crow	2	100+	
									American Redstart	1	0-50	
									American Robin	4	0-50	
									American Robin	5	50-100	
									American Robin	4	100+	
									Black-and-white Warbler	1	0-50	
									Black-throated Green Warbler	2	0-50	
									Common Yellowthroat	2	0-50	
									Hermit Thrush	1	0-50	
									Magnolia Warbler	1	50-100	
									Magnolia Warbler	1	100+	
									Mourning Dove	3	50-100	
									Nashville Warbler	1	0-50	
									Northern Parula	1	100+	
									Ovenbird	1	50-100	
									Ovenbird	2	0-50	
									Purple Finch	2	0-50	
									Red-eyed Vireo	1	0-50	
									Red-eyed Vireo	1	50-100	
									Ring-necked Pheasant	1	100+	
									Rose-breasted Grosbeak	1	0-50	
									Swainson's Thrush	3	0-50	
									Yellow Warbler	1	0-50	
	Mill/TH10	0472736E, 5019990N	Young mixed	Calm	13	Overcast	None	6:06AM	Alder Flycatcher	1	100+	
									American Crow	1	100+	
									American Goldfinch	1	0-50	
									American Robin	5	0-50	
									American Robin	4	50-100	
									American Robin	6	100+	
									Black-and-white Warbler	1	0-50	
									Black-throated Green Warbler	2	50-100	
									Black-throated Green Warbler	2	100+	
									Blue Jay	1	50-100	
									Common Loon	1	100+	
									Common Raven	1	100+	
									Common Yellowthroat	2	50-100	
									Hermit Thrush	2	100+	
									Magnolia Warbler	1	0-50	
									Magnolia Warbler	1	50-100	
									Nashville Warbler	1	0-50	
									Northern Parula	1	0-50	
									Purple Finch	2	0-50	
									Purple Finch	2	50-100	
									Purple Finch	3	100+	
									Red-eyed Vireo	2	0-50	
									Red-eyed Vireo	2	100+	
									Swainson's Thrush	1	50-100	
									Swainson's Thrush	1	100+	

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
									White-throated Sparrow	1	0-50	
									White-throated Sparrow	2	50-100	
	Mill/TH11	0472577E, 5020184N	Mid-aged mixed	10 km/hr W with Gusts of 20 km/hr	13	Overcast	None	6:30AM	American Crow	3	100+	
									American Goldfinch	1	0-50	
									American Redstart	1	0-50	
									American Robin	2	0-50	
									American Robin	4	50-100	
									American Robin	3	100+	
									Black-and-white Warbler	1	0-50	
									Black-capped Chickadee	6	50-100	Family
									Black-throated Blue Warbler	1	100+	
									Black-throated Green Warbler	1	0-50	
									Black-throated Green Warbler	1	50-100	
									Black-throated Green Warbler	2	100+	
									Blue Jay	1	100+	
									Blue-headed Vireo	1	50-100	
									Blue-headed Vireo	1	100+	
									Cedar Waxwing	2	0-50	
									Chestnut-sided Warbler	1	0-50	
									Common Yellowthroat	1	50-100	
									Golden-crowned Kinglet	1	0-50	
									Hairy Woodpecker	1	50-100	
									Hermit Thrush	1	0-50	
									Hermit Thrush	2	100+	
									Magnolia Warbler	1	0-50	
									Magnolia Warbler	1	50-100	
									Mourning Dove	2	50-100	
									Northern Parula	1	100+	
									Ovenbird	1	0-50	
									Ovenbird	1	100+	
									Pileated Woodpecker	2	100+	1 Adult, 1 Young
									Purple Finch	2	0-50	
									Red-eyed Vireo	1	0-50	
									Red-eyed Vireo	2	100+	
									Red-tailed Hawk	1	100+	
									Swainson's Thrush	1	50-100	
									White-throated Sparrow	3	50-100	
	Mill/TH12	0472670E, 5020441N	Young hardwood	10 km/hr W with Gusts of 20 km/hr	13	Overcast	None	7:00AM	American Crow	3	100+	
									American Robin	2	0-50	
									American Robin	3	50-100	
									American Robin	7	100+	
									Black-and-white Warbler	1	0-50	
									Black-capped Chickadee	7	0-50	Family
									Black-throated Blue Warbler	1	100+	
									Black-throated Green Warbler	1	0-50	
									Black-throated Green Warbler	2	50-100	

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
									Black-throated Green Warbler	2	100+	
									Chestnut-sided Warbler	1	0-50	
									Hairy Woodpecker	2	50-100	
									Hermit Thrush	2	50-100	
									Hermit Thrush	2	100+	
									Magnolia Warbler	2	0-50	
									Magnolia Warbler	2	50-100	
									Mourning Dove	1	50-100	
									Ovenbird	1	0-50	
									Ovenbird	2	50-100	
									Purple Finch	4	0-50	
									Red-breasted Nuthatch	2	100+	
									Red-eyed Vireo	1	0-50	
									Red-eyed Vireo	1	100+	
									Swainson's Thrush	2	0-50	
									Swainson's Thrush	1	50-100	
									Swainson's Thrush	1	100+	
									Veery	1	100+	
	Mill/TH6	0473155E, 5019500N	Young hardwood	10 km/hr W with Gusts of 20 km/hr	13	Overcast	None	7:35AM	American Redstart	2	0-50	
									American Redstart	1	50-100	
									American Robin	1	0-50	
									American Robin	4	50-100	
									American Robin	6	100+	
									Black-and-white Warbler	1	0-50	
									Black-and-white Warbler	1	50-100	
									Black-capped Chickadee	1	100+	
									Black-throated Green Warbler	2	50-100	
									Black-throated Green Warbler	2	100+	
									Blue Jay	2	0-50	
									Blue Jay	1	50-100	
									Blue-headed Vireo	1	0-50	
									Blue-headed Vireo	1	100+	
									Chestnut-sided Warbler	2	0-50	
									Common Loon	1	100+	
									Common Yellowthroat	1	0-50	
									Common Yellowthroat	2	50-100	
									Magnolia Warbler	2	0-50	
									Magnolia Warbler	3	50-100	
									Magnolia Warbler	3	100+	
									Mourning Dove	3	50-100	2 Adult 1 young
									Purple Finch	2	0-50	
									Red-eyed Vireo	2	0-50	
									Red-eyed Vireo	3	50-100	
									Red-eyed Vireo	2	100+	
									Rose-breasted Grosbeak	1	100+	
									Swainson's Thrush	1	0-50	
									Swainson's Thrush	2	50-100	

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Pairs
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
	Mill/TH2	0473219E, 5019219N	Shrub hardwoods, high proportion of yellow birch	10 km/hr W with Gusts of 20 km/hr	13	Overcast	None	8:03AM	American Crow	1	100+	
									American Goldfinch	2	0-50	
									American Robin	3	0-50	
									American Robin	1	50-100	
									Black-and-white Warbler	1	0-50	
									Black-and-white Warbler	1	50-100	
									Blue-headed Vireo	1	0-50	
									Blue-headed Vireo	1	50-100	
									Common Loon	1	100+	
									Common Yellowthroat	1	50-100	
									Least Flycatcher	2	0-50	
									Magnolia Warbler	2	0-50	
									Magnolia Warbler	2	50-100	
									Mourning Dove	2	0-50	
									Northern Flicker	1	50-100	
									Northern Flicker	1	100+	
									Osprey	1	F/O S	
									Purple Finch	1	0-50	
									Red-eyed Vireo	2	0-50	
									Red-eyed Vireo	2	50-100	
	Mill/TH3	0473332E, 5018951N	Young hardwood	10 km/hr W with Gusts of 20 km/hr	13	Overcast	None	8:32AM	American Redstart	1	0-50	
									American Robin	1	0-50	
									American Robin	2	50-100	
									American Robin	4	100+	
									Blue-headed Vireo	1	0-50	
									Common Yellowthroat	1	0-50	
									Magnolia Warbler	1	0-50	
									Magnolia Warbler	2	50-100	
									Mourning Dove	1	0-50	
									Ovenbird	1	0-50	
									Ovenbird	2	50-100	
									Ovenbird	2	100+	
									Red-eyed Vireo	1	0-50	
									Red-eyed Vireo	1	50-100	
									Red-eyed Vireo	2	100+	

Table G6: Breeding Bird Survey Results Summary, Millbrook/Truro Heights Community Wind Projects *Project # 12-4328/12-4544*

Common Name	Scientific Name	NSDNR Status	COSEWIC Status	SARA Status	NSESA Status	Number of Times Observed	Number of Individuals Observed
Alder Flycatcher	*Empidonax alnorum*	Green	Not Listed	Not Listed	Not Listed	2	5
American Robin	*Turdus migratorius*	Green	Not Listed	Not Listed	Not Listed	50	182
American Crow	*Corvus brachyrhynchos*	Green	Not Listed	Not Listed	Not Listed	13	20
American Goldfinch	*Spinus tristis*	Green	Not Listed	Not Listed	Not Listed	13	28
American Redstart	*Setophaga ruticilla*	Green	Not Listed	Not Listed	Not Listed	19	38
American Woodcock	*Scolopax minor*	Green	Not Listed	Not Listed	Not Listed	1	1
Black-and-white Warbler	*Mniotilta varia*	Green	Not Listed	Not Listed	Not Listed	22	27
Black-capped Chickadee	*Poecile atricapillus*	Green	Not Listed	Not Listed	Not Listed	8	22
Black-throated Blue Warbler	*Dendroica caerulescens*	Green	Not Listed	Not Listed	Not Listed	2	2
Black-throated Green Warbler	*Dendroica virens*	Green	Not Listed	Not Listed	Not Listed	33	64
Blue Jay	*Cyanocitta cristata*	Green	Not Listed	Not Listed	Not Listed	8	9
Blue-headed Vireo	*Vireo solitarius*	Green	Not Listed	Not Listed	Not Listed	10	11
Cedar Waxwing	*Bombycilla cedrorum*	Green	Not Listed	Not Listed	Not Listed	1	2
Chestnut-sided Warbler	*Dendroica pensylvanica*	Green	Not Listed	Not Listed	Not Listed	5	6
Chipping Sparrow	*Spizella passerina*	Green	Not Listed	Not Listed	Not Listed	1	1
Common Loon	*Gavia immer*	Red	Not at Risk	Not Listed	Not Listed	4	4
Common Nighthawk	*Chordeiles minor*	Red	Threatened	Threatened	Threatened	1	1
Common Raven	*Corvus corax*	Green	Not Listed	Not Listed	Not Listed	1	1
Common Yellowthroat	*Geothlypis trichas*	Green	Not Listed	Not Listed	Not Listed	18	23
Dark-eyed Junco	*Junco hyemalis*	Green	Not Listed	Not Listed	Not Listed	3	7
Eastern Wood-Pewee	*Contopus virens*	Yellow	Not Listed	Not Listed	Not Listed	1	2
Golden-crowned Kinglet	*Regulus satrapa*	Yellow	Not Listed	Not Listed	Not Listed	1	1
Hairy Woodpecker	*Picoides villosus*	Green	Not Listed	Not Listed	Not Listed	3	5
Hermit Thrush	*Catharus guttatus*	Green	Not Listed	Not Listed	Not Listed	13	35
Least Flycatcher	*Empidonax minimus*	Green	Not Listed	Not Listed	Not Listed	5	9
Magnolia Warbler	*Dendroica magnolia*	Green	Not Listed	Not Listed	Not Listed	28	41
Mourning Dove	*Zenaida macroura*	Green	Not Listed	Not Listed	Not Listed	18	33
Nashville Warbler	*Vermivora ruficapilla*	Green	Not Listed	Not Listed	Not Listed	5	5
Northern Flicker	*Colaptes auratus*	Green	Not Listed	Not Listed	Not Listed	10	15
Northern Parula	*Parula americana*	Green	Not Listed	Not Listed	Not Listed	6	7
Osprey	*Pandion haliaetus*	Green	Not Listed	Not Listed	Not Listed	1	1
Ovenbird	*Seiurus aurocapilla*	Green	Not Listed	Not Listed	Not Listed	26	36
Pileated Woodpecker	*Dryocopus pileatus*	Green	Not Listed	Not Listed	Not Listed	1	2
Purple Finch	*Carpodacus purpureus*	Green	Not Listed	Not Listed	Not Listed	13	24
Red Crossbill	*Loxia curvirostra*	Green	Not Listed	Not Listed	Not Listed	1	1
Red-breasted Nuthatch	*Sitta canadensis*	Green	Not Listed	Not Listed	Not Listed	2	3
Red-eyed Vireo	*Vireo olivaceus*	Green	Not Listed	Not Listed	Not Listed	44	85
Red-tailed Hawk	*Buteo jamaicensis*	Green	Not at Risk	Not Listed	Not Listed	3	3
Ring-necked Pheasant	*Phasianus colchicus*	Exotic	Not Listed	Not Listed	Not Listed	2	2
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Yellow	Not Listed	Not Listed	Not Listed	3	4
Ruby-crowned Kinglet	*Regulus calendula*	Yellow	Not Listed	Not Listed	Not Listed	1	1
Ruffed Grouse	*Bonasa umbellus*	Green	Not Listed	Not Listed	Not Listed	4	4
Sharp-shinned Hawk	*Accipiter striatus*	Green	Not at Risk	Not Listed	Not Listed	1	1
Song Sparrow	*Melospiza melodia*	Green	Not Listed	Not Listed	Not Listed	1	1

Common Name	Scientific Name	NSDNR Status	COSEWIC Status	SARA Status	NSESA Status	Number of Times Observed	Number of Individuals Observed
Swainson's Thrush	*Catharus ustulatus*	Green	Not Listed	Not Listed	Not Listed	25	57
Tennessee Warbler	*Vermivora peregrina*	Yellow	Not Listed	Not Listed	Not Listed	2	2
Veery	*Catharus fuscescens*	Green	Not Listed	Not Listed	Not Listed	2	3
White-throated Sparrow	*Zonotrichia albicollis*	Green	Not Listed	Not Listed	Not Listed	11	23
Winter Wren	*Troglodytes troglodytes*	Green	Not Listed	Not Listed	Not Listed	5	5
Yellow Warbler	*Dendroica petechia*	Green	Not Listed	Not Listed	Not Listed	3	3
Yellow-bellied Flycatcher	*Empidonax flaviventris*	Yellow	Not Listed	Not Listed	Not Listed	3	8
Yellow-rumped Warbler	*Dendroica coronata*	Green	Not Listed	Not Listed	Not Listed	1	1

	Confirmed Breeder
	Probable Breeder
	Possible Breeder

Table G7: Detailed Fall Bird Survey Results Summary, Millbrook/Truro Heights Community Wind Projects ***Project # 12-4328/12-4544***

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Height for flyovers (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
Sept. 18/2012	Mill/TH7	0473243E, 5019782N	Young hardwood	<10 km/h	8	Clear	None	7:34 AM	American Crow	4	100+	-
...	...	...	...	...	...	...	...	...	American Robin	1	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Mourning Dove	2	100+	-
...	...	...	...	...	...	...	...	...	Palm Warbler	1	0-50	-
...	...	...	...	...	...	...	...	...	Purple Finch	2	50-100	-
...	...	...	...	...	...	...	...	...	White-throated Sparrow	4	50-100	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	1	0-50	-
...	Mill/TH6	0473155E, 5019500N	Young hardwood	<10 km/h	8	Clear	None	7:53 AM	American Crow	4	100+	-
...	...	...	...	...	...	...	...	...	American Goldfinch	1	0-50	-
...	...	...	...	...	...	...	...	...	American Robin	2	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	6	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	F/O SE-NW	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	6	0-50	-
...	...	...	...	...	...	...	...	...	Mourning Dove	2	100+	-
...	...	...	...	...	...	...	...	...	Purple Finch	2	0-50	-
...	...	...	...	...	...	...	...	...	Red-breasted Nuthatch	1	100+	-
...	...	...	...	...	...	...	...	...	White-throated Sparrow	6	0-50	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	2	0-50	-
...	Mill/TH2	0473219E, 5019219N	Shrub hardwoods, high proportion of yellow birch	<10 km/h	8	Clear	None	8:09 AM	American Goldfinch	5	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	50-100	-
...	...	...	...	...	...	...	...	...	Hermit Thrush	1	0-50	-
...	...	...	...	...	...	...	...	...	Magnolia Warbler	1	0-50	-
...	...	...	...	...	...	...	...	...	Mourning Dove	2	100+	-
...	...	...	...	...	...	...	...	...	Northern Flicker	1	F/O W-E	<100 m
...	...	...	...	...	...	...	...	...	Palm Warbler	1	0-50	-
...	...	...	...	...	...	...	...	...	Purple Finch	2	0-50	-
...	...	...	...	...	...	...	...	...	White-throated Sparrow	6	0-50	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	2	0-50	-
...	Mill/TH3	0473332E, 5018951N	Young hardwood	<10 km/h	8	Clear	None	8:38 AM	American Crow	4	100+	-
...	...	...	...	...	...	...	...	...	American Goldfinch	2	50-100	-
...	...	...	...	...	...	...	...	...	American Redstart	1	0-50	-
...	...	...	...	...	...	...	...	...	Black-and-white Warbler	1	0-50	-
...	...	...	...	...	...	...	...	...	Blackburnian Warbler	1	0-50	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	10	0-50	-
...	...	...	...	...	...	...	...	...	Blackpoll Warbler	2	0-50	-
...	...	...	...	...	...	...	...	...	Black-throated Green Warbler	2	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	50-100	-
...	...	...	...	...	...	...	...	...	Blue-headed Vireo	3	0-50	-
...	...	...	...	...	...	...	...	...	Common Loon	1	100+	-
...	...	...	...	...	...	...	...	...	Magnolia Warbler	4	0-50	-
...	...	...	...	...	...	...	...	...	Nashville Warbler	2	0-50	-
...	...	...	...	...	...	...	...	...	Northern Parula	1	0-50	-

Table G7: Detailed Fall Bird Survey Results Summary, Millbrook/Truro Heights Community Wind Projects *Project # 12-4328/12-4544*

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Height for flyovers (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
...	...	...	...	...	...	...	...	...	Purple Finch	2	50-100	-
...	...	...	...	...	...	...	...	...	Red-eyed Vireo	1	0-50	-
...	...	...	...	...	...	...	...	...	Ruby-crowned Kinglet	2	0-50	-
...	...	...	...	...	...	...	...	...	White-throated Sparrow	6	50-100	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	2	0-50	-
...	Mill/TH4	0473341E, 5018660N	Young hardwood	<10 km/h	8	Clear	None	8:58 AM	American Crow	2	100+	-
...	...	...	...	...	...	...	...	...	Blackpoll Warbler	3	0-50	-
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	7	0-50	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	4	0-50	-
...	Mill/TH5	0473185E, 5018431N	Young mixed	<10 km/h	8	Clear	None	9:15 AM	American Crow	4	100+	-
...	...	...	...	...	...	...	...	...	American Robin	1	100+	-
...	...	...	...	...	...	...	...	...	Purple Finch	2	0-50	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	2	0-50	-
...	Mill/TH9	0472984E, 50119881N	Young mixed	<10 km/h	8	Clear	None	9:49 AM	American Goldfinch	2	50-100	-
...	...	...	...	...	...	...	...	...	American Robin	2	0-50	-
...	...	...	...	...	...	...	...	...	American Robin	1	50-100	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	6	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	50-100	-
...	...	...	...	...	...	...	...	...	Common Grackle	1	50-100	-
...	...	...	...	...	...	...	...	...	Purple Finch	2	0-50	-
...	Mill/TH10	0472736E, 5019990N	Young mixed	<10 km/h	8	Clear	None	10:06 AM	American Goldfinch	2	0-50	-
...	...	...	...	...	...	...	...	...	American Robin	1	0-50	-
...	...	...	...	...	...	...	...	...	Black-and-white Warbler	2	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	50-100	-
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	8	0-50	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	4	0-50	-
...	...	...	...	...	...	...	...	...	Magnolia Warbler	3	0-50	-
...	...	...	...	...	...	...	...	...	Pileated Woodpecker	1	0-50	-
...	...	...	...	...	...	...	...	...	Purple Finch	4	0-50	-
...	...	...	...	...	...	...	...	...	Red-breasted Nuthatch	1	0-50	-
...	...	...	...	...	...	...	...	...	Ruby-throated Hummingbird	1	0-50	-
...	...	...	...	...	...	...	...	...	White-throated Sparrow	6	0-50	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	7	0-50	-
...	Mill/TH11	0472577E, 5020184N	Mid-aged mixed	<10 km/h	8	Clear	None	10:24 AM	American Crow	2	50-100	-
...	...	...	...	...	...	...	...	...	American Crow	2	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	7	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	0-50	-
...	...	...	...	...	...	...	...	...	Magnolia Warbler	2	0-50	-
...	...	...	...	...	...	...	...	...	Northern Flicker	1	50-100	-
...	Mill/TH12	0472670E, 5020441N	Young hardwood	<10 km/h	8	Clear	None	10:41 AM	American Crow	4	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	2	0-50	-
...	...	...	...	...	...	...	...	...	Black-throated Green Warbler	1	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	50-100	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Magnolia Warbler	2	0-50	-

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Height for flyovers (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
...	...	...	...	...	...	...	...	...	Purple Finch	2	50-100	-
...	Mill/TH8	0473319E, 5020050N	Young mixed	<10 km/h	8	Clear	None	11:15 AM	American Goldfinch	2	0-50	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	2	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	0-50	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	2	0-50	-
...	...	...	...	...	...	...	...	...	Mourning Dove	1	F/O W-E	100 m
...	...	...	...	...	...	...	...	...	Red-breasted Nuthatch	1	0-50	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	2	0-50	-
October 5/2012	Mill/TH1	0474149E, 5022136N	Field, some standing mixedwoods	Calm	14	Overcast/ Fog	None	7:37 AM	American Crow	4	0-50	-
...	...	...	...	...	...	...	...	...	American Crow	2	100+	-
...	...	...	...	...	...	...	...	...	American Robin	7	0-50	-
...	...	...	...	...	...	...	...	...	Mourning Dove	1	100+	-
...	Mill/TH2	0473219E, 5019219N	Shrub hardwoods, high proportion of yellow birch	Calm	14	Overcast/ Fog	None	7:53 AM	American Crow	4	0-50	-
...	...	...	...	...	...	...	...	...	American Crow	2	100+	-
...	...	...	...	...	...	...	...	...	American Robin	7	0-50	-
...	...	...	...	...	...	...	...	...	Mourning Dove	1	100+	-
...	Mill/TH3	0473332E, 5018951N	Young hardwood	Calm	16	Overcast/ Fog	None	8:19 AM	American Robin	2	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	6	0-50	-
...	Mill/TH4	0473341E, 5018660N	Young hardwood	Calm	16	Overcast/ Fog	None	8:46 AM	American Crow	2	100+	-
...	...	...	...	...	...	...	...	...	American Robin	2	0-50	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	10	0-50	-
...	...	...	...	...	...	...	...	...	Black-throated Green Warbler	1	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Boreal Chickadee	2	50-100	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	8	0-50	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	10	0-50	-
...	...	...	...	...	...	...	...	...	Purple Finch	2	0-50	-
...	...	...	...	...	...	...	...	...	Ruby-crowned Kinglet	2	0-50	-
...	...	...	...	...	...	...	...	...	White-throated Sparrow	15	0-50	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	10	0-50	-
...	Mill/TH5	0473185E, 5018431N	Young mixed	Calm	16	Overcast/ Fog	None	9:07 AM	American Crow	3	50-100	-
...	...	...	...	...	...	...	...	...	American Crow	4	100+	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	0-50	-
...	Mill/TH6	0473155E, 5019500N	Young hardwood	Calm	16	Overcast/ Fog	None	9:30 AM	Blue Jay	2	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	50-100	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	1	0-50	-
...	Mill/TH7	0473243E, 5019782N	Young hardwood	Calm	16	Overcast/ Fog	None	9:44 AM	American Crow	4	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	4	0-50	-

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Height for flyovers (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
...	...	...	...	...	...	...	...	...	Gray Jay	2	0-50	-
...	Mill/TH8	0473319E, 5020050N	Young mixed	Calm	16	Overcast/ Fog	None	10:25 AM	American Crow	16	100+	-
...	Mill/TH8	0473319E, 5020050N	...	...	...	...	...	...	American Goldfinch	2	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	3	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	2	100+	-
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	6	0-50	-
...	...	...	...	...	...	...	...	...	Purple Finch	2	0-50	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	50-100	-
...	Mill/TH9	0472984E, 50119881N	Young mixed	Calm	16	Overcast/ Fog	None	10:49 AM	American Crow	1	0-50	-
...	...	...	...	...	...	...	...	...	American Crow	6	100+	-
...	...	...	...	...	...	...	...	...	American Robin	2	0-50	-
...	...	...	...	...	...	...	...	...	American Robin	12	50-100	-
...	...	...	...	...	...	...	...	...	Black-billed Cuckoo	1	0-50	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	20	0-50	-
...	...	...	...	...	...	...	...	...	Blackpoll Warbler	2	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	3	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	4	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Common Grackle	135	0-50	-
...	...	...	...	...	...	...	...	...	Common Grackle	6	50-100	-
...	...	...	...	...	...	...	...	...	Common Raven	2	0-50	-
...	...	...	...	...	...	...	...	...	Common Raven	2	100+	-
...	...	...	...	...	...	...	...	...	Common Yellowthroat	2	0-50	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	11	0-50	-
...	...	...	...	...	...	...	...	...	Herring Gull	1	100+	-
...	...	...	...	...	...	...	...	...	Pine Siskin	2	0-50	-
...	...	...	...	...	...	...	...	...	Red-winged Blackbird	60	FO SW to NW	100 m
...	...	...	...	...	...	...	...	...	Red-winged Blackbird	80	0-50	-
...	...	...	...	...	...	...	...	...	White-breasted Nuthatch	1	0-50	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	3	0-50	-
...	Mill/TH10	0472736E, 5019990N	Young mixed	Calm	17	Overcast/f og	None	11:09 AM	American Crow	1	50-100	-
...	...	...	...	...	...	...	...	...	American Crow	2	100+	-
...	...	...	...	...	...	...	...	...	American Robin	6	0-50	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	5	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	4	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	4	100+	-
...	...	...	...	...	...	...	...	...	Hermit Thrush	2	50-100	-
...	...	...	...	...	...	...	...	...	Purple Finch	4	50-100	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	100+	-
...	...	...	...	...	...	...	...	...	White-throated Sparrow	6	50-100	-
...	Mill/TH12	0472670E, 5020441N	...	Calm	17	Overcast/f og	None	11:23 AM	American Robin	11	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	50-100	-
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	4	0-50	-
...	...	...	...	...	...	...	...	...	Pileated Woodpecker	1	0-50	-
...	...	...	...	...	...	...	...	...	Swainson's Thrush	2	0-50	-

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Height for flyovers (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
...	...	...	...	...	...	...	...	...	White-throated Sparrow	7	0-50	-
October 24/2012	Mill/TH24	473305E, 5018563N	Young Hardwood	10 km/h W	5	Partical Cloudy	None	8:00 AM	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	3	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	F/O E-W	-
...	...	...	...	...	...	...	...	...	Brown Creeper	1	0-50	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Downy Woodpecker	1	0-50	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	3	0-50	-
...	...	...	...	...	...	...	...	...	Yellow-rumped Warbler	1	50-100	-
...	Mill/TH23	473158E, 5018392N	Young Hardwood	10 km/h W	5	Partical Cloudy	None	8:20 AM	Black-capped Chickadee	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	50-100	-
...	Mill/TH22	473039E, 5018225N	Young mixed wood	10 km/h W	5	Partical Cloudy	None	8:39 AM	American Crow	3	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	4	0-50	-
...	...	...	...	...	...	...	...	...	Evening Grosbeak	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	3	0-50	-
...	...	...	...	...	...	...	...	...	Pine Siskin	1	0-50	-
...	...	...	...	...	...	...	...	...	Red-breasted Nuthatch	1	0-50	-
...	...	...	...	...	...	...	...	...	Rose-breasted Grosbeak	2	50-100	-
...	...	...	...	...	...	...	...	...	Rose-breasted Grosbeak	1	0-50	-
...	Mill/TH15	473096E, 5017936N	Young hardwood	10 km/h W	5	Partical Cloudy	None	8:56 AM	Black-capped Chickadee	2	0-50	-
...	...	...	...	...	...	...	...	...	Brown Creeper	1	0-50	-
...	...	...	...	...	...	...	...	...	Common Raven	2	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	3	0-50	-
...	Mill/TH13	473105E, 5017743N	Young Mixedwood	10 km/h W	5	Partical Cloudy	None	9:12 AM	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	0-50	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Northern Flicker	1	100+	-
...	Mill/TH14	473348E, 5017645N	Mixedwood	10 km/h W	6	Mainly Cloudy	None	9:32 AM	Black-capped Chickadee	4	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	2	0-50	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	3	50-100	-
...	Mill/TH16	473563E, 5017826N	Softwood/Stream	10 km/h W	6	Partly Cloudy	None	9:52 AM	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	2	50-100	-
...	...	...	...	...	...	...	...	...	Pine Grosbeak	2	50-100	-
...	Mill/TH17	473487E, 5018013N	Sugar maple mid-mature	10 km/h W	6	Partly Cloudy	None	10:10 AM	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	Mill/TH18	473389E, 5018413N	Mixedwood	10 km/h W	6	Partly Cloudy	None	10:28 AM	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Brown Creeper	1	50-100	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	0-50	-
...	...	...	...	...	...	...	...	...	Downy Woodpecker	1	50-100	-

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Height for flyovers (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	4	0-50	-
...	...	...	...	...	...	...	...	...	Red-breasted Nuthatch	1	50-100	-
...	Mill/TH19	473488E, 5018282N	Regenerating Cutblock	10 km/h W	6	Partly Cloudy	None	10:44 AM	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	2	50-100	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	2	0-50	-
...	...	...	...	...	...	...	...	...	Brown Creeper	1	50-100	-
...	...	...	...	...	...	...	...	...	Common Raven	2	50-100	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	3	50-100	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	2	0-50	-
...	Mill/TH20	473275E, 5018249N	Regenerating Cutblock Fir dominated	15 km/h W gusts 25 km/h	6	Partly Cloudy	None	11:06 AM	American Goldfinch	2	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	3	50-100	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	1	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Downy Woodpecker	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	50-100	-
...	...	...	...	...	...	...	...	...	Pine Grosbeak	1	50-100	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	4	F/O NW-SE	-
...	Mill/TH21	473287E, 5017963N	Windfall hardwood stand	15 km/h W gusts 25 km/h	6	Partly Cloudy	None	11:27 AM	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Pine Grosbeak	3	0-50	-
November 5/2012	Mill/TH9	0472984E, 50119881N	Young mixed	Calm	5	Cloudy	None	7:14 AM	American Crow	2	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	4	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	0-50	-
...	...	...	...	...	...	...	...	...	Herring Gull	1	F/O W	-
...	...	...	...	...	...	...	...	...	Pileated Woodpecker	1	100+	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	100+	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	2	100+	-
...	Mill/TH10	0472736E, 5019990N	Young mixed	Calm	5	Cloudy	None	7:30 AM	American Crow	3	100+	-
...	...	...	...	...	...	...	...	...	American Goldfinch	2	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	7	100+	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	1	100+	-
...	...	...	...	...	...	...	...	...	Downy Woodpecker	2	100+	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	0-50	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	2	100+	-
...	Mill/TH11	0472577E, 5020184N	Mid-aged mixed	Calm	5	Cloudy	None	7:51 AM	American Crow	2	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	3	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Blue Jay	3	0-50	-
...	...	...	...	...	...	...	...	...	Common Raven	2	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	50-100	-

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Height for flyovers (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
...	...	...	...	...	...	...	...	...	Pileated Woodpecker	1	100+	-
...	...	...	...	...	...	...	...	...	Song Sparrow	1	50-100	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	2	100+	-
...	Mill/TH12	0472670E, 5020441N	Young hardwood	Calm	5	Partly Cloudy	None	8:07 AM	American Crow	3	100+	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	0-50	-
...	...	...	...	...	...	...	...	...	Boreal Chickadee	1	0-50	-
...	...	...	...	...	...	...	...	...	Dark-eyed Junco	1	0-50	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	2	0-50	-
...	...	...	...	...	...	...	...	...	Hairy Woodpecker	1	0-50	-
...	...	...	...	...	...	...	...	...	Pileated Woodpecker	2	100+	-
...	Mill/TH6	0473155E, 5019500N	Young hardwood	Calm	7	Mainly Sunny	None	8:40 AM	American Goldfinch	1	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	3	50-100	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	3	100+	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	50-100	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	0-50	-
...	Mill/TH2	0473219E, 5019219N	Shrub hardwoods, high proportion of yellow birch	Calm	7	Mainly Sunny	None	8:58 AM	American Crow	21	F/O N	-
...	...	...	...	...	...	...	...	...	American Goldfinch	1	F/O E	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	1	0-50	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	2	50-100	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	1	F/O S	-
...	Mill/TH3	0473332E, 5018951N	Young hardwood	Calm	7	Mainly Sunny	None	9:13 AM	American Crow	5	100+	-
...	...	...	...	...	...	...	...	...	American Robin	1	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	4	50-100	-
...	...	...	...	...	...	...	...	...	Brown Creeper	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	2	50-100	-
...	Mill/TH4	0473341E, 5018660N	Young hardwood	Calm	7	Mainly Sunny	None	9:27 AM	American Crow	5	100+	-
...	...	...	...	...	...	...	...	...	American Goldfinch	2	F/O NE	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	0-50	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	4	0-50	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	2	100+	-
...	Mill/TH7	0473243E, 5019782N	Young hardwood	Calm	9	Mainly Cloudy	None	9:52 AM	American Goldfinch	1	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	2	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	3	100+	-
...	Mill/TH8	0473319E, 5020050N	Young mixed	Calm	9	Mainly Cloudy	None	10:08 AM	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	4	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	50-100	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	100+	-
...	...	...	...	...	...	...	...	...	Pine Grosbeak	1	100+	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	0-50	-

Table G7: Detailed Fall Bird Survey Results Summary, Millbrook/Truro Heights Community Wind Projects ***Project # 12-4328/12-4544***

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Height for flyovers (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
...	Mill/TH5	0473185E, 5018431N	Young mixed	Calm	9	Mainly Cloudy	None	10:42 AM	American Crow	2	F/O E	-
...	...	...	...	...	...	...	...	...	Black-capped Chickadee	1	100+	-
...	...	...	...	...	...	...	...	...	Brown Creeper	1	50-100	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	50-100	-
November 15/2012	Mill/TH24	473305E, 5018563N	Young Hardwood	25 km/h N (Gusts 40 km/h stopped survey for 2 minutes)	5	Overcast	None	7:30 AM	Golden-crowned Kinglet	1	50-100	-
...	...	...	...	...	...	...	...	...	Pine Grosbeak	10	F/O SW	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	0-50	-
...	Mill/TH23	473158E, 5018392N	Young Hardwood	20 km/h N (Gust 35 km/h stopped survey for one minute)	5	Mainly Cloudy	None	7:49 AM	Pine Grosbeak	1	100+	-
...	Mill/TH22	473039E, 5018225N	Young mixed wood	20 km/h N	5	Mainly Cloudy	None	8:04 AM	Black-capped Chickadee	4	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	3	F/O E-W	-
...	Mill/TH15	473096E, 5017936N	Young hardwood	20 km/h N (Gust 35 km/h stopped survey for one minute)	5	Mainly Cloudy	None	8:21 AM	Golden-crowned Kinglet	1	0-50	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	0-50	-
...	Mill/TH13	473105E, 5017743N	Young Mixedwood	20 km/h N (Gust 35 km/h stopped survey for one minute)	5	Mainly Cloudy	None	8:37 AM	American Crow	2	100+	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	2	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	0-50	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	1	100+	-
...	Mill/TH14	473348E, 5017645N	Mixedwood	20 km/h N (Gust 35 km/h stopped survey for two minutes)	5	Mainly Cloudy	None	8:58 AM	Black-capped Chickadee	2	0-50	-
...	...	...	...	...	...	...	...	...	Blue Jay	2	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Downy Woodpecker	1	0-50	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	2	0-50	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	50-100	-
...	Mill/TH16	473563E, 5017826N	Softwood/Stream	15 km/h N (Gusts 40 km/h stopped survey for a minute)	5	Mainly Cloudy	None	9:21 AM	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	2	0-50	-
...	...	...	...	...	...	...	...	...	Pine Grosbeak	1	F/O NE	-
...	Mill/TH17	473487E, 5018013N	Sugar maple mid-mature	15 km/h N	5	Mainly Cloudy	None	9:38 AM	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-

Table G7: Detailed Fall Bird Survey Results Summary, Millbrook/Truro Heights Community Wind Projects ***Project # 12-4328/12-4544***

Date	Location	Coordinates (UTM NAD83)	Habitat	Conditions				Time	Species	Number Observed	Distance to Observer (m)	Height for flyovers (m)
				Wind Speed and Direction	Temperature °C	Sky	Precipitation					
...	...	...	...	...	...	...	...	...	Blue Jay	1	F/O N-S	-
...	Mill/TH18	473389E, 5018413N	Mixedwood	25 km/h N (Gust 40 km/h stopped survey for 3 minutes)	5	Mainly Cloudy	None	9:54 AM	American Crow	1	100+	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	50-100	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	1	F/O NW-SE	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	3	F/O E-W	-
...	Mill/TH19	473488E, 5018282N	Regenerating Cutblock	25 km/h N (Gust 40 km/h stopped survey for 3 minutes)	5	Mainly Cloudy	None	10:12 AM	No Birds Observed	...	...	-
...	Mill/TH20	473275E, 5018249N	Regenerating Cutblock Fir dominated	25 km/h N (Gust 40 km/h stopped survey for 3 minutes)	5	Sun and Cloud	None	10:32 AM	American Crow	1	F/O NW-SE	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	1	50-100	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	4	F/O NW-SE	-
...	Mill/TH21	473287E, 5017963N	Windfall hardwood stand	20 km/h N	5	Sun and Cloud	None	11:10 AM	Black-capped Chickadee	4	100+	-
...	...	...	...	...	...	...	...	...	Blue Jay	1	100+	-
...	...	...	...	...	...	...	...	...	Common Raven	1	100+	-
...	...	...	...	...	...	...	...	...	Evening Grosbeak	1	100+	-
...	...	...	...	...	...	...	...	...	Golden-crowned Kinglet	2	100+	-
...	...	...	...	...	...	...	...	...	Pine Grosbeak	2	100+	-
...	...	...	...	...	...	...	...	...	Ruffed Grouse	1	0-50	-
...	...	...	...	...	...	...	...	...	White-winged Crossbill	2	100+	-

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status	Number of Observations	Number of Individuals Observed
American Crow	*Corvus brachyrhynchos*	Not Listed	Not Listed	Not Listed	Green	40	134
American Goldfinch	*Spinus tristis*	Not Listed	Not Listed	Not Listed	Green	13	25
American Redstart	*Setophaga ruticilla*	Not Listed	Not Listed	Not Listed	Green	1	1
American Robin	*Turdus migratorius*	Not Listed	Not Listed	Not Listed	Green	15	58
Black-and-white Warbler	*Mniotilta varia*	Not Listed	Not Listed	Not Listed	Green	2	3
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Not Listed	Not Listed	Not Listed	Red	1	1
Blackburnian Warbler	*Dendroica fusca*	Not Listed	Not Listed	Not Listed	Green	1	1
Black-capped Chickadee	*Poecile atricapillus*	Not Listed	Not Listed	Not Listed	Green	31	132
Blackpoll Warbler	*Dendroica striata*	Not Listed	Not Listed	Not Listed	Yellow	3	7
Black-throated Green Warbler	*Dendroica virens*	Not Listed	Not Listed	Not Listed	Green	3	4
Blue Jay	*Cyanocitta cristata*	Not Listed	Not Listed	Not Listed	Green	50	84
Blue-headed Vireo	*Vireo solitarius*	Not Listed	Not Listed	Not Listed	Green	1	3
Boreal Chickadee	*Poecile hudsonicus*	Not Listed	Not Listed	Not Listed	Yellow	2	3
Brown Creeper	*Certhia americana*	Not Listed	Not Listed	Not Listed	Green	6	6
Common Grackle	*Quiscalus quiscula*	Not Listed	Not Listed	Not Listed	Green	3	142
Common Loon	*Gavia immer*	Not Listed	Not Listed	Not at Risk	Red	1	1
Common Raven	*Corvus corax*	Not Listed	Not Listed	Not Listed	Green	32	40
Common Yellowthroat	*Geothlypis trichas*	Not Listed	Not Listed	Not Listed	Green	1	2
Dark-eyed Junco	*Junco hyemalis*	Not Listed	Not Listed	Not Listed	Green	9	43
Downy Woodpecker	*Picoides pubescens*	Not Listed	Not Listed	Not Listed	Green	5	6
Evening Grosbeak	*Coccothraustes vespertinus*	Not Listed	Not Listed	Not Listed	Green	2	2
Golden-crowned Kinglet	*Regulus satrapa*	Not Listed	Not Listed	Not Listed	Yellow	33	84
Gray Jay	*Perisoreus canadensis*	Not Listed	Not Listed	Not Listed	Yellow	1	2
Hairy Woodpecker	*Picoides villosus*	Not Listed	Not Listed	Not Listed	Green	1	1
Hermit Thrush	*Catharus guttatus*	Not Listed	Not Listed	Not Listed	Green	2	3
Herring Gull	*Larus argentatus*	Not Listed	Not Listed	Not Listed	Green	2	2
Magnolia Warbler	*Dendroica magnolia*	Not Listed	Not Listed	Not Listed	Green	5	12
Mourning Dove	*Zenaida macroura*	Not Listed	Not Listed	Not Listed	Green	6	9
Nashville Warbler	*Vermivora ruficapilla*	Not Listed	Not Listed	Not Listed	Green	1	2
Northern Flicker	*Colaptes auratus*	Not Listed	Not Listed	Not Listed	Green	3	3
Northern Parula	*Parula americana*	Not Listed	Not Listed	Not Listed	Green	1	1
Palm Warbler	*Dendroica palmarum*	Not Listed	Not Listed	Not Listed	Green	2	2
Pileated Woodpecker	*Dryocopus pileatus*	Not Listed	Not Listed	Not Listed	Green	5	6
Pine Grosbeak	*Pinicola enucleator*	Not Listed	Not Listed	Not Listed	Red	8	21
Pine Siskin	*Spinus pinus*	Not Listed	Not Listed	Not Listed	Yellow	2	3
Purple Finch	*Carpodacus purpureus*	Not Listed	Not Listed	Not Listed	Green	11	26
Red-breasted Nuthatch	*Sitta canadensis*	Not Listed	Not Listed	Not Listed	Green	5	5
Red-eyed Vireo	*Vireo olivaceus*	Not Listed	Not Listed	Not Listed	Green	1	1
Red-winged Blackbird	*Agelaius phoeniceus*	Not Listed	Not Listed	Not Listed	Green	2	140
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Not Listed	Not Listed	Not Listed	Yellow	2	3

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status	Number of Observations	Number of Individuals Observed
Ruby-crowned Kinglet	*Regulus calendula*	Not Listed	Not Listed	Not Listed	Yellow	2	4
Ruby-throated Hummingbird	*Archilochus colubris*	Not Listed	Not Listed	Not Listed	Green	1	1
Ruffed Grouse	*Bonasa umbellus*	Not Listed	Not Listed	Not Listed	Green	11	14
Song Sparrow	*Melospiza melodia*	Not Listed	Not Listed	Not Listed	Green	1	1
Swainson's Thrush	*Catharus ustulatus*	Not Listed	Not Listed	Not Listed	Green	1	2
White-breasted Nuthatch	*Sitta carolinensis*	Not Listed	Not Listed	Not Listed	Green	1	1
White-throated Sparrow	*Zonotrichia albicollis*	Not Listed	Not Listed	Not Listed	Green	8	56
White-winged Crossbill	*Loxia leucoptera*	Not Listed	Not Listed	Not Listed	Green	13	29
Yellow-rumped Warbler	*Dendroica coronata*	Not Listed	Not Listed	Not Listed	Green	11	35

APPENDIX H
ARIA RESPONSE LETTER FROM NS COMMUNITIES, CULTURE AND HERITAGE

NOVA SCOTIA
Communities, Culture & Heritage
1747 Summer Street
Halifax, Nova Scotia
B3H 3A6
Tel: (902) 424-6475
Fax: (902) 424-0560

April 29, 2013

Ms. April MacIntyre
Davis, MacIntyre and Associates
109 John Stewart Drive
Cole Harbour, NS B2W 4J7

Dear Ms. MacIntyre:

RE: Heritage Research Permit Report
A2012NS088- Millbrook Wind Farm

We have received and reviewed your report on work conducted under the terms of Heritage Research Permit A2012NS088 of an archaeological resource impact assessment of the proposed Millbrook and Truro Heights Community Wind Farms, Colchester County.

The report details the archaeological resource impact assessment of the proposed 5 turbine project area for the combined Millbrook Community and Truro Heights Community Wind Project by Davis, MacIntyre & Associates in October 2012. The assessment included background and historical research as well as field reconnaissance of the proposed project area in order to determine the potential for archaeological resources.

The assessment of the proposed Millbrook Community Wind Project area indicated that although First Nations and later, Acadians, were in the wider area, there is no indication that they were present in the study area. First Nations peoples would not have had access to the necessary resources or transportation routes in the study area that the Bay would have afforded them. The Acadians would have had little reason to settle away from the fertile marshland and move to the rocky soil characteristic of the study area. Roads in to the uplands were not present until 1902. The reconnaissance indicated that the study area was largely logged throughout the later quarter of the 20th century and no evidence of pre-contact or historic archaeological activity was observed. Note that though archaeological resources are unlikely to exist on the west side of Soley Brook in the area that could not be surveyed, it is recommended that this area be surveyed prior to construction when a center line has been cut or the blow down removed. It is also noted, that a preliminary project footprint was assessed. Should the project footprint divert from that which was investigated during the assessment, it is recommended that the area be subjected to an archaeological reconnaissance.

The assessment of the proposed Truro Heights Community Wind Project area indicated that although First Nations and later, Acadians, were in the wider area, there is no indication that they were present in the study area. First Nations peoples would not have had access to the necessary resources or transportation routes in the study area that the Bay would have afforded them. The Acadians would have had little reason to settle away from the fertile marshland and move to the rocky soil characteristic of the study area. Roads in to the uplands were not present until 1902. The reconnaissance indicated that the study are was largely logged throughout the later quarter of the 20th century and no evidence of pre-contact or historic archaeological activity was observed. Note that a preliminary project footprint was assessed. Should the project footprint divert from that which was investigated during the assessment, it is recommended that the area be subjected to an archaeological reconnaissance.

Overall, the study area was determined to be of low archaeological potential for both First Nations and Euro-Canadian resources therefore no further mitigation is recommended for the current proposed turbine sites. The only cultural activity near the study area was located along north along Soley and McNutt's Brooks where sawmills and related camps were established and to the south where a single building, possibly a camp related to gypsum extraction, were located. Should the project footprint divert from the footprint divert from the footprint that was surveyed at the time of the reconnaissance, it is recommended that these areas be surveyed by a qualified archaeologist to ensure that no archaeological resources are present or will be impacted by construction. Finally, in the unlikely event that archaeological resources are encountered during construction, it is required that all activity cease and the Coordinator of Special places be contacted.
Staff agree with the recommendations, and find the report acceptable as submitted. If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

Laura Bennett
Coordinator, Special Places

cc. Andy Walter, Strum Environmental

APPENDIX I
MI'KMAQ ECOLOGICAL KNOWLEDGE STUDY

A Mi'kmaq Historical and Ecological Knowledge Study for:
Truro Heights wind farm

Submitted by:

NEXUS Coastal Resource Management
103-287Lacewood Drive, Suite 222
Halifax, NS
B3M 3Y7

April 30, 2013

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1 INTRODUCTION

1.1 Indigenous Knowledge and Knowledge Systems

The collective rights of Indigenous Peoples have gained an increased recognition at the international level over the past 25 years. The International Labor Organization Convention-169 recognized the right of Indigenous Peoples to take control over their own institutions, way of life and economic development, as well as to maintain and develop their culture (ILO, 1989). More recently, the United Nations Declaration on the Rights of Indigenous Peoples set out the individual and collective rights of Indigenous Peoples as well as their rights to culture, identity, language, employment, health, education and other issues (UN, 2008). Indigenous knowledge is an integral component of the Indigenous rights movement. Knowledge manifests itself in the Indigenous community's language, identity and culture.

Indigenous Knowledge (IK)[1] fuses the cultural, social and ecological histories of a community. In general, IK systems assume that people are part of the land, they do not own the land and are instead stewards of the land. IK is dynamic, based upon an intimate understanding of the components of non-living (abiotic) and living (biotic) environments. The knowledge is owned by Indigenous Peoples, which differs between peoples. IK is based on four principles (Singh, 2007):

1. IK is dynamic in nature.
2. IK is tradition based: the way in which knowledge is created, preserved and disseminated.
3. IK is collective in nature and is often considered to be the property of the community.
4. IK is transferred through cultural specific transmission mechanisms[2].

The use of IK has been the subject of international discourse. Growing recognition of the limitations of conventional science in solving ecological problems of increasing complexity and magnitude has turned focus back to IK. IK systems are based on the shared experiences, customs, values, traditions, lifestyles, social interactions and spiritual beliefs specific to Indigenous communities. These systems are forever evolving as new knowledge is obtained or generated.

Over the years, the use of Indigenous Traditional Knowledge (ITK) in Environmental Assessments, Environmental Impact Statements and co-management agreements has

[1] Other phrases for Indigenous Knowledge (IK) include Aboriginal Knowledge (AK), Indigenous Traditional Knowledge (ITK) and Aboriginal Traditional Knowledge (ATK).
[2] Mechanisms include but are not limited to storytelling, ceremonies, dances, traditions, arts and crafts, hunting and trapping, beliefs, medicines, innovations

increased substantially. IK is an accumulation of multiple knowledge sources, one of which is 'Traditional Ecological Knowledge'[3] (TEK) (Stevenson, 1996).

IK studies differ from TEK studies in such that IK includes spiritual, cultural and environmental components in the study, while TEK focuses on the environmental knowledge of an Indigenous Nation. TEK studies have been designed to parallel the western science discipline of ecology (Simpson, 2001). Constructing IK into TEK is a process of 'scientizing' IK for use in Western society. A properly designed TEK includes viewing IK as worldviews, values and processes (Simpson, 2001). It is important to include the context in which gives the knowledge its meaning.

The increased awareness and application of IK through TEK studies in non-indigenous society has brought both opportunities and challenges for Indigenous Nations. Meaningful use of IK can provide Indigenous Nations leverage in pursuing both political and property rights (Stevenson, 1996). With the increased use of IK particular attention has been directed to protect and preserve this knowledge from misappropriation, misuse and theft. Of particular concern to Indigenous Peoples has been the unlicensed use by industry, researchers, artists and authors of traditional knowledge that has been developed over centuries (AFN, n.d.).

In Canada, the application of IK in collaboration with the western approach to resource management has occurred primarily through committees and IK studies. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) established an Aboriginal Traditional Knowledge[4] Sub-Committee to facilitate access to and gathering of available IK as well as the incorporation of this knowledge into the COSEWIC species assessment process (COSEWIC, 2012). Section 16.1 of the *Canadian Environmental Assessment Act,* 2012, provides authorities the discretion to consider IK in an Environmental Assessment.

In Nova Scotia an IK study is referred to as Mi'kmaq Ecological Knowledge study (MEKs).

1.2 The Mi'kmaq Nation

Since time immemorial, Mi'kmaq have used and occupied their traditional territory known as *Mi'kma'ki*, which includes Nova Scotia, Prince Edward Island, New Brunswick, parts of Quebec, Newfoundland and the northeastern parts of Maine. Archaeological sites in Nova Scotia provide evidence of Mi'kmaq occupation for over 10,500 years (Assembly of Nova Scotia Mi'kmaq Chiefs, 2007).

Mi'kma'ki is identified through its seven districts: *Kespukwitk, Sikepne'katik, Eski'kewaq, Unama'kik, Piktuk aqq Epetwitk, Sikniktewaq* and *Kespe'kewaq* (Figure 1). Mi'kmaw names for the seven districts came from the geographical characteristics of the area. Traditional socio-political organization consisted of hereditary Local, District and Grand

[3] A review of traditional knowledge sources can be found in Stevensn (1996).

Chiefs. The Local Chief took care of village affairs in a district with advice from a council of Elders. The District Chief presided over all the Local Chiefs in a given district, while the Grand Chief assigned fishing and hunting privileges and was the official spokesperson for the Mi'kmaq Nation. The Grand Chief has the authority to make treaties with other First Nations and governments. Presently, the Grand Chief and Council (Grand Council) are located in *Unama'kik*.

There are 13 Mi'kmaq Bands in Nova Scotia, each occupying specific areas of land, known as reserves. As set forth in the Indian *Act*, *1951,* each Band is led by a Chief and Council.

Figure 1: Traditional Mi'kmaq Districts (from http://www.danielnpaul.com/Map-Mi'kmaqTerritory.html)

1.3 Mi'kmaq Ecological Knowledge

The Mi'kmaq approach to resource management is best defined through the word, *Netukulimk. Netukulimk* describes the relationship between Mi'kmaq and the Creator in which the Mi'kmaq use the resources provided by the Creator for self-support and wellbeing of the individual and community. *Netukulimk* is achieving adequate standards of community nutrition and economic well-being without jeopardizing the integrity, diversity, or productivity of the environment (UINR, 2011). Simply put, one takes only what he or she needs from the environment to provide a livelihood. *Netukulimk* is expressed through the performance of rituals and the keeping of customary practices (Prosper et al., 2011). While some have argued that the eventual dominance of British

colonial rule eroded traditional Mi'kmaq worldviews, there is strong evidence that Mi'kmaq harvests are still governed by *Netukulimk* principles (Prosper et al., 2011).

Mi'kmaq, like many Indigenous Nations, incorporate cultural and social attributes along with sustenance in resource management. A case study provides insight into the Mi'kmaq relationship with *Ka't* (American Eel- Anguilla rostrata) (Davis et al., 2004). Mi'kmaq would spend the winter months near Antigonish, Nova Scotia fishing for *Ka't.* Mi'kmaq use *Ka't* for food, and it is considered to have spiritual qualities as evident by its frequent appearance in many legends and its use as ceremonial offerings. *Ka't* was also used medicinally as the skin was used as braces and bandages.

Mi'kmaq and Western (Post-Colonial) approaches to resource management are different. This difference can be attributed to Mi'kmaq and Western views of the environment.

In the Mi'kmaq culture, it is understood that *Mi'kma'ki* is held in communal ownership and does not belong to a particular person as it is believed that the land was inherited from their ancestors and would be passed on to their children (Berneshawi, 1997). Natural resources, renewable or non-renewable are considered as gifts from the Creator and therefore can neither be owned nor sold (Lyons, 1984 in Berneshawi, 1997). Similarly, neither the land nor its resources are viewed as commodities. In contrast Western approaches to resource management employ the control and ownership of land and resources. In Canada, it is understood that the Crown, represented by the federal government owns resources (renewable and non-renewable), lands and waters that fall within state boundaries. The federal government facilitates access to the resources and land through a series of licenses and agreement made between federal departments and individuals or corporations. In the Western approach to resource management, these assets are viewed as commodities that can be sold for profit.

In 2008, the Assembly of Nova Scotia Mi'kmaq Chiefs adopted a Mi'kmaq Ecological Knowledge Study protocol which described MEK as a term that "refers to any knowledge relating to the environment including water, land and resources" (MRI, 2008, 1). This knowledge can be cultural, spiritual or ecological. The concept of MEK is not static, but is instead derived from the cumulative experiences of the Mi'kmaq people, based in their traditional territory. In this manner MEK considers and incorporates emerging resource issues. It is therefore important for any MEKS to accurately include Mi'kmaq knowledge of the affected resources, lands and waters in order to understand the relationship between the Mi'kmaq and the project area. As discussed above (section 1.1), a MEKS must describe the cultural, spiritual and ecological relationship of Mi'kmaq with the proposed project site.

1.4 Project Study Areas

Mi'kmaq Ecological Knowledge studies for four wind farms: Millbrook, Truro Heights, Whynott's Settlement and Pockwock are being conducted simultaneously. NEXUS Coastal Resource Management has been engaged to conduct a Mi'kmaq Ecological Knowledge Study for the four Study Areas. The proposed wind turbine farms are located in two Mi'kmaq Districts: *Kespukwitk and Sikepne'katik*

This report deals with the specifics of the proposed Truro Heights wind farm (Figure 1Figure 2). The Millbrook and Truro Heights wind farms are being developed collaboratively.

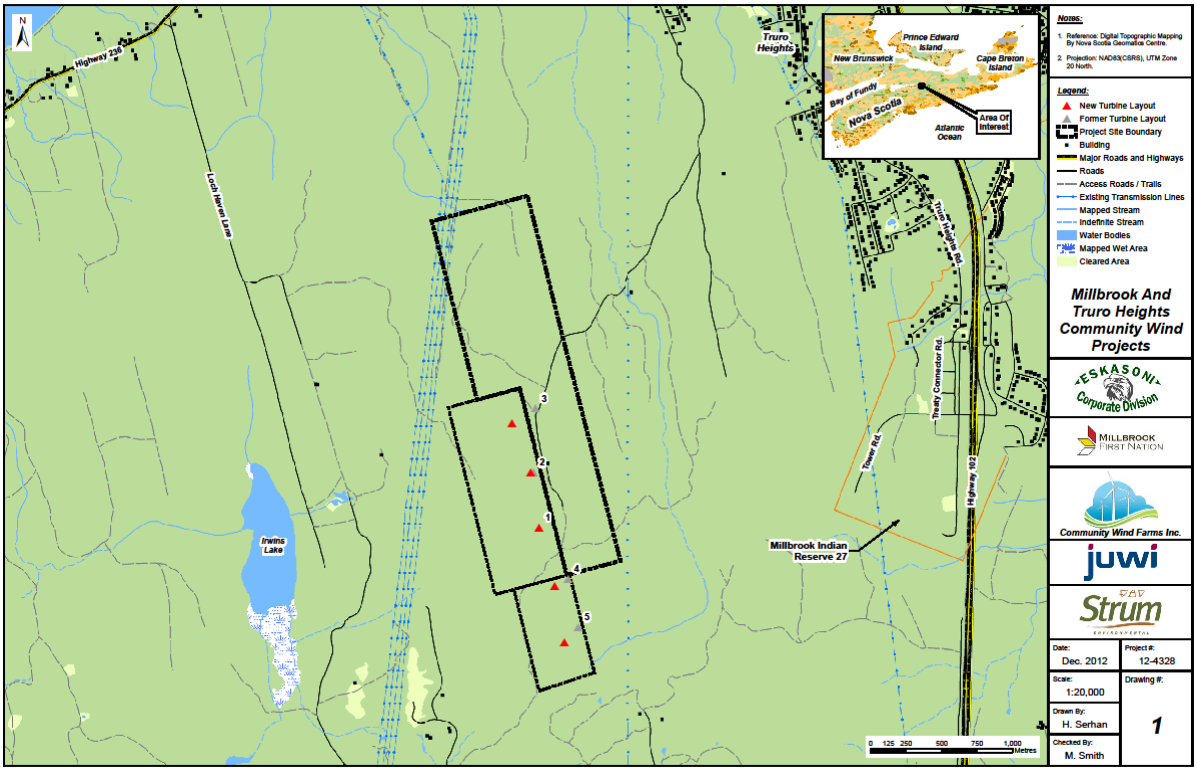

Figure 2: Proposed wind farm in Millbrook, NS

2 BACKGROUND

2.1 Historical Context

Traditionally the Mi'kmaq Nation was a member of the Wabanaki Confederacy, a loose coalition that included the Maliseets, the Pasamaquoddy, the Penobscots, Wowenock and the Eastern and Western Abenakis (Berneshawi, 1997). The Confederacy influenced tribal life from the Gaspé Peninsula to northern New England. The Confederacy continued to function until the early 1700s, at which time the decimation of its member nations by disease and war with the English caused it to become dormant (Paul, 2006).

Traditional Mi'kmaq social structure consisted of a matrilineal, egalitarian and is family centered with living with extended family being common place (Berneshawi, 1997). The strong family connection ensured that the needs of a community were put ahead of individuals. Sharing and the communal use of resources were important for the survival of the Mi'kmaq. There was no hierarchy authority amongst Mi'kmaq. Decision making was made through a consensus approach. The daily life of the Mi'kmaq centered on finding and preparing food, and the sharing of wealth among members of the village (CMM, 2007). Mi'kmaq depended on their knowledge of the seasons, weather, animals, plants and hunting and preparation skills for survival. This knowledge was passed down from generation to generation. Mi'kmaq education included the teaching of traditional hunting skills, construction techniques, food preparation, etc. Traditional teachings, stories, and histories were collected and passed on through an oral tradition.

Archaeological evidence and oral histories suggest that Mi'kmaq travelled to various camps throughout the year. The proportion of terrestrial mammals, marine mammals, fish and shellfish vary greatly across sites and occupations indicating that Mi'kmaq used camps for specific uses (Barsh, 2002).

In the early 1500s, European fishermen travelled to the coasts of North America to fish the Grand Banks off Newfoundland. These fishermen would occasionally come to shore to dry the fish they caught. In the late 1500s a fur trade between Mi'kmaq and Europeans was established and Europeans begun to create settlements throughout *Mi'kma'ki.*

Prior to the fur trade with Europeans, the Mi'kmaq diet consisted largely of meat, animal fat, fish, berries and nuts and broth (Miller, 1976; Krieger, 2002). Mi'kmaq undertook seasonal migrations which aligned with food sources: wild berries, tubers, nuts and herbs (also used for medicine). During the summer months Mi'kmaq lived in coastal villages to harvest seafood and berries; during the winter months they dispersed into smaller bands and moved inland to hunt big game and fish in the rivers. In addition to being used as food, Mi'kmaq used plants for cures and prevention for many common

ailments (UINR, 2010). The fur trade brought non-traditional foods to the Mi'kmaq in exchange for fur. Trade would have included dried peas, corn, beans, prunes, and wheat flour among other things (Miller, 1976).

The 1600s and 1700s were marked by a series of wars between the French and British. These wars often included alliances made between the Europeans, the Mi'kmaq and other First Nations. One of the first treaties between the Mi'kmaq and the British was signed in 1725 in Boston, later ratified by many Mi'kmaq and Maliseet communities in Annapolis Royal in 1726. This was the first treaty in what is now known as the "Peace and Friendship Treaties". The Royal Proclamation of 1763 reserved a large portion of land in North America as Indian hunting grounds and set out a process for cession and purchase of Indian grounds.

The Grand Council continues to exist, but its authority to govern has been largely transferred by the *Indian Act, 1951*, to the elected Band Chiefs and Councils. There are thirteen Mi'kmaq Bands in Nova Scotia, four of which are located within close proximity of the three proposed wind farms sites. These communities were identified due their proximity to the proposed wind farm sites and their historical and contemporary use of the project area and its resources. The four communities involved in the Mi'kmaq Ecological Knowledge Study include Indian Brook First Nation, Millbrook First Nation, Acadia First Nation and Glooscap First Nation.

Indian Brook First Nation is one of four reserves of the Shubenacadie Band and is the second largest First Nation community in Nova Scotia. In 1848, an Indian Commissioner settled 14 families at Shubenacadie. Indian Brook is located approximately 26km southeast of the proposed wind farm in Millbrook, NS.

In the late 1700's and early 1800's Millbrook First Nation was originally located along the banks of the Salmon River, but were later moved to a property on King Street in Truro (presently St. Mary's school is located on King Street) to make room for the School of Agriculture (Millbrook, 2013). Millbrook Mi'kmaq refer to the King Street location as Christmas Crossing. In 1873 Millbrook First Nation initiated discussions with the Indian Agent to move their reserve from Christmas Crossing to Millbrook. The original Millbrook reserve had a total of 35 acres. Between 1904 and 1910 an additional 120 acres was purchased by the reserve. Millbrook is located approximately 1.7km west of the proposed wind farm in Millbrook, NS.

Acadia First Nation is comprised of five reserves located throughout Southwestern Nova Scotia. The first reserve, Gold River, was established in 1820, and the Yarmouth reserve was established in 1887. Acadia First Nation gained official status from the Canadian Government in 1971 when the Elders of the region decided to form a united Band (Falls, n.d.). Gold River is located approximately 18km northeast of the proposed wind farm in the Whynott's Settlement, 5km northeast of Bridgewater, in Lunenburg County (Strum, 2011b).

The Glooscap First Nation was formed in the 1800s in conjunction with the Micmac Missionary Society. In 1907, the land of the present day reserve was transferred to his Majesty the King for use as an Indian Reserve (Glooscap, n.d.). Glooscap is located approximately 50km west of the proposed wind farm in Pockwock, NS.

2.2 Environmental Context

The proposed Millbrook wind farm site is located just southwest of the town of Truro, NS, in Colchester County. The Project site is zoned as a resource forest land and is surrounded by forestry lands (Service Nova Scotia, 2011). The site lies within the Windsor Lowlands Ecodistrict, located on an undulating to rolling glacial till plain where imperfectly drained, deep, compacted, loam to clay loam till is the dominant surficial material. The tills become thinner and stony and are mostly derived from the underlying shale, sandstone, limestone and gypsum of the Carboniferous period where the site lies (Webb and Marshal, 1999). The vegetation in the region comprised mainly of softwood and mixed wood forests. This provides habitat for a variety of different wildlife species including white-tailed deer, porcupine, red fox and coyote (Webb and Marshall, 1999).

2.3 Mi'kmaq Wildlife Uses

Historically, the Mi'kmaq practiced a nomadic lifestyle, migrating between hunting and fishing grounds throughout their traditional lands (Chute, 1999). These migrations followed the seasonal cycles of the plants and wildlife in region, which formed the basis of a pattern of Mi'kmaq subsistence. Much of this migration was dependent on riverine and coastal transportation, resulting in a heavy dependence on fish and seafood, which represented a significant portion of the Mi'kmaq diet. Large mammals, especially moose, were also particularly important due to annual subsistence pattern of the people. This was linked to the size of the animal, its seasonal availability and the wide variety of uses the people employed from it (food, clothing and various tools).

During the early winter the Mi'kmaq hunted spawning seals in coastal areas and near shore islands. As the winter progressed they moved inland to more sheltered areas and hunted large game, such as moose, which moved slowly in the deep snow. Winter was also the time to hunt deer, beaver, otter, muskrat and caribou (Davis, 1997). In the spring the Mi'kmaq moved closer to the coastal areas and estuaries in order to catch fish runs in the rivers, using weirs to catch smaller fish such as smelt, eel or bass, and leisters for larger fish such as salmon. Migratory birds such as ducks and geese also started to return during this period, and were often hunted at night (Davis, 1997). During the summer the Mi'kmaq were able to take full advantage of coastal areas and various species of shellfish available to them such as mussels, clams, whelk, lobster and crab. A variety of salt water fish species, such as the cod, mackerel and plaice also appeared in coastal waters as the summer worn on. In the autumn southward migrations of birds moved through the area and salmon, eel and other fish species began to move down the rivers. Certain species were hunted year round; while others may have been pursed on

an opportunistic basis. This is likely the case with large marine mammals such as whales, which the Mi'kmaq valued for food, as a source of oil and for tool making (Barsh, 2002; Lockerby, 2004).

2.3.1 Woodland Wildlife

Table 1 describes the various uses for the large mammals and other animals found in the forests of Nova Scotia. While many of these animals provided meat for food, they also offered other uses such as furs for clothing, bones for tools and a variety of medicinal purposes. The arrival of Europeans also opened up the fur trade which created an additional use for certain species such as the beaver, which were highly valued in foreign markets (Davis, 1997). The Mi'kmaq also used certain animal parts, such as porcupine quills, as decoration on clothing or other items.

Table 1: Mi'kmaq Woodland Wildlife Uses

Species	Common Name, *Mi'kmaw Name[5]	Habitat	Mi'kmaq Traditional Uses	Source
Alces alces	Moose, **Team'* **Tiya:m*	Young forests, including wet sites near lakes and swamps. Common in highlands of Cape Breton Island.	Moose meat was a principal food source, as was the oil made from fat which was able to be stored for long periods. Moose also provided a variety of tools such as bone hand tools, bladders for storage and hides for clothing and shoes, shelter, canoes and variety of other purposes.	Barsh, 2002; Bridgland et al, 2007; Caplan, 1978; Davis, 1997; Lockerby, 2004; Maxwell, 1993; VanWart, 1948; Wicken, 1994
Anura (generic)	Toad, **Ĕmkŏkchăjit* **Amqoqjaji*	Found in a variety of areas near a water source including fields, forests and agricultural lands.	Toads were used for medicinal purposes.	VanWart, 1948
Castor canadensis	Beaver, **Kobet* **Kopit*	Slow-flowing streams, lakes, rivers, marshes, and coastal wetlands, usually in forested areas near aspen stands.	Beaver offered an important seasonal food source, and were also used to in a variety of clothing, tools and medicines. Upon European arrival the beaver would become the most important source of the fur trade.	Barsh, 2002; Caplan, 1978; Davis, 1997; Krieger, 2002; Lockerby, 2004; Maxwell, 1993; McNab, 1998; VanWart, 1948;

[5] DeBlois, 1997; Rand, 1888

Species	Common Name, *Mi'kmaw Name[5]	Habitat	Mi'kmaq Traditional Uses	Source
				Wallis, 1922: Wicken, 1994
Cervus canadensis	Elk, N/A	Historic presence in Nova Scotia	Elk were a food source, and were likely used in the same manner as other large game.	Davis, 1997; Maxwell, 1993
Felis lynx	Canada Lynx, N/A	Young, dense softwood thickets and swamps. Most common on the highlands of Cape Breton Island.	Lynx furs were sold in the fur trade and also used for clothing.	Barsh, 2002; Maxwell, 1993
Lepus americanus	Hare, *Able'gŭmocch *Apli:kmuj	Usually found in conifer thickets and alder swamps	Hare were used as a food source	VanWart, 1948
Lutra canadensis	River Otter, *Ňlktŭk *Kiw'nik	Marine or freshwater environments, wetlands.	Otter were hunted for food and fur. The pelts were sold and also used in clothing.	Barsh, 2002; Davis, 1997; Krieger, 2002; Maxwell, 1993; VanWart, 1948; Wicken, 1994
Generic (*Martes)*	Marten, *Abistănāooch' *Apistanewj	Usually found in mature coniferous or mixed forest areas.	Marten furs were sold in the fur trade and used in clothing.	Barsh, 2002; Maxwell, 1993
Hystricomorph Hystricidae	Porcupine, *Năbegŏk *Matuwes	Found in forested areas throughout mainland Nova Scotia, rare in Cape Breton.	Porcupine were used for food and medicine, and the quills were often dyed and used for decoration of clothing.	Davis, 1997; Krieger, 2002; Maxwell, 1993; VanWart, 1948; Wallis, 1922; Wicken, 1994
Mephitis mephitis	Striped Skunk, *Abŭkcheloo *Apikjilu	Semi-open forested areas and agricultural lands.	Skunk furs were sold in the fur trade and parts of the animal were used for medicine.	(Barsh, 2002; VanWart, 1948; Wallis, 1922)
Mustela vison	American Mink, *Moochpĕch' *mujpej	Variety of wetland habitats, including watercourses, lakes, marshes, and sea coasts.	Archeological evidence of mink at Mi'kmaq campsites demonstrates historical use.	Barsh, 2002

Species	Common Name, *Mi'kmaw Name[5]	Habitat	Mi'kmaq Traditional Uses	Source
Odocoileus virginianus	White Tailed Deer, **Lŭntook'* **Lentuk*	Edge areas between forests and openings, fields and cut overs close to forest cover areas.	Deer offered a valuable food source, and furs could be used or sold in the fur trade. Parts of deer were also used for medicinal purposes.	Parnaby, 2008; VanWart, 1948; Wallis, 1922
Ondatra zibethica	Muskrat, **Keooāsoo* **Ki:kwesu*	Marshes, lakes, and rivers with roughly equal amounts of open water and above-water vegetation.	Muskrat were trapped for the fur trade; the pelts were also used in clothing.	Maxwell, 1993; McNab, 1998
Procyon lotor	Raccoon, **Amalchoogwĕch'* **Amaljikwej*	Abundant across mainland Nova Scotia and Cape Breton Island. Found in urban areas and edges such as streams, marshes, and field/forest boundaries.	Raccoon furs were sold in the fur trade and parts of the animal were used for medicine.	Barsh, 2002; Wallis, 1922
Rangifer tarandus	Caribou, **Kāleboo* **Kalipu*	Historic presence in Nova Scotia	Caribou offered another large game food and fur source when migrating through Mi'kmaq territory.	Barsh, 2002; Caplan, 1978; Davis, 1997; McNab, 1998; VanWart, 1948; Wicken, 1994
Serpentes (generic)	Snake, **Mtāāskŭm* **Mteskm*	Woodlands, agricultural and rocky areas across the province.	Snakes were used for medicinal purposes.	VanWart, 1948
Tamiasciurus hudsonicus	Red Squirrel, **Adoo'dooguĕch* **Atu:tuwej*	Common throughout mature softwood and mixed wood forests.	Squirrel fur was used in clothing, and parts of the animal were used for medicine.	Maxwell, 1993; Wallis, 1922
Ursus americanus	Black Bear, **Mooin* **Muwin*	Forested or wooded areas and swamps. Also settled areas for easy food sources such as bee hives, agricultural crops, and garbage.	Bear were a food source and the hides could be used or sold.	Barsh, 2002; Caplan, 1978; Davis, 1997; Maxwell, 1993; Parnaby, 2008; VanWart, 1948; Wicken, 1994
Vulpes vulpes	Red Fox, **Wokwis* **Wowkwis*	Found throughout Nova Scotia, usually in agricultural areas intermixed with woods.	Fox were trapped for their pelts, which were sold in the fur trade.	(Barsh, 2002; McNab, 1998)

2.3.2 Freshwater Species

Table 2 represents the freshwater, anadromous and catadromous species utilized by the Mi'kmaq. The majority of these species were used mainly as food sources, however medicinal or other uses were possible. It is also important to note that many animals hold non-utility value, for example the spiritual and cultural significance of Atlantic Salmon to the people of Listuguj or eels to the people of Paq'tknkek.

Table 2: Mi'kmaq Freshwater Species Use

Species	Common Name, **Mi'kmaw Name*[6]	Habitat	Mi'kmaq Traditional Uses	Source
Anura (generic)	Frog, **Ŭchkoolch* **Sqolj*	Various species found in streams, rivers, brooks and lakes throughout the province.	Frogs were used for medicinal purposes	VanWart, 1948
Alosa sapidissima	American Shad, **Ŭmsamoo* **Msamu*	Anadromous fish species lives in coastal waters, returning to freshwater rivers to spawn.	Shad were a source of food.	Barsh, 2002; Caplan, 1978
Anguilla Rostrata	American Eel, **Kat* **Ka:t*	Found in the freshwater streams, rivers, lakes and brackish coastal waters.	Eel were a source of food and parts of the animal were used for medicine.	Barsh, 2002; Caplan, 1978; Maxwell, 1993; McNab, 1998; VanWart, 1948; Wicken, 1994
Coregonus huntsmani	Atlantic Whitefish, N/A	Anadromous species found in lakes, rivers and estuaries.	Whitefish were a source of food.	Barsh, 2002
Esox (generic)	Pike, **Měskilk nŭmāāch*	Found in lakes rivers streams and brackish waters.	Pike were a source of food.	Barsh, 2002
Perciformes (generic)	Bass, **Chegaoo* **Jikaw*	Nova Scotia is home to various species of bass which range from fresh to salt water habitats.	Bass were a source of food.	Barsh, 2002; VanWart, 1948
Salmo/Salvelinus(generi	Trout,	Various species found in streams, rivers,	Trout were a source of food.	Barsh, 2002;

[6] DeBlois, 1997; Rand, 1888

Species	Common Name, *Mi'kmaw Name[6]	Habitat	Mi'kmaq Traditional Uses	Source
c)	*Adagwaasoo *Atoqwa:su	brooks and lakes throughout the province.		Caplan, 1978; Maxwell, 1993; VanWart, 1948; Wicken, 1994
Salmo salar	Atlantic Salmon, *Pălămoo *Plamu	Found in the Northern Atlantic ocean, returning to freshwater rivers and streams each year to spawn.	Salmon were an important seasonal food, as well as symbol of cultural identity for Mi'kmaq of Listuguj.	Caplan, 1978; Davis, 1997; Krieger, 2002; Maxwell, 1993; McNab, 1998; VanWart, 1948; Wicken, 1994
Siluriformes (generic)	Catfish, *Ŭtkogwĕch'	Shallow muddy lakes or slow moving streams	Catfish were a source of food.	Barsh, 2002
Testudines (generic)	Turtle, *Mikjikj	Various species found in streams, rivers, brooks and lakes throughout the province.	Turtles were a source of food.	Caplan, 1978

2.3.3 Birds

Table 3 depicts the various bird species harvest by the Mi'kmaq. While the majority of the species were used for food purposes (meat or eggs), other uses included feathers for guides on arrows, or for decorative purposes. It is important to note that some of the birds listed refer to generic groups, the uses and species of which were not always specified. For example, references to eagles as food may refer to the collection of eggs, or may encompass a wide variety of birds such as turkey vultures. The migratory nature of many birds would have limited the Mi'kmaq to seasonal harvests, while other woodland or marine species could be found year round.

Table 3: Mi'kmaq Bird Use

Species	Common Name, *Mi'kmaw Name[7]	Habitat	Mi'kmaq Traditional Uses	Source
Accipitridae (generic)	Eagle, **Kitpoo* **Kitpu*	Isolated forested areas near large bodies of water.	Large birds offered a food source, and feathers were used as guides on arrows.	Lockerby, 2004; Maxwell, 1993
Anatidae (generic)	Duck, **Apchechk*	Wetlands, lakes, rivers, streams and coastal areas.	Ducks were a source of food.	Barsh, 2002; Caplan, 1978; Davis, 1997; Maxwell, 1993; VanWart, 1948; Wicken, 1994)
Anas (generic)	Teal, **Ŭchŭgwè'ch'*	Wetlands, lakes, rivers, streams and coastal areas.	Teal were a source of food.	VanWart, 1948
Anserini (generic)	Goose, **Senŭmkw'* **Takli*:j	Wetlands, lakes, rivers, streams and coastal areas.	Geese were a source of food.	VanWart, 1948
Branta bernicla	Brant Goose, **Mogŭlaweech*	Wetlands, lakes, rivers, streams and coastal areas.	Brant Geese were a source of food.	Lockerby, 2004; Maxwell, 1993
Branta canadensis	Canada Goose, N/A	Wetlands, lakes, rivers, streams and coastal areas.	Canada Geese were a source of food.	Lockerby, 2004
Clangula hyemalis	Oldsquaw, N/A	Wetlands, lakes, rivers, streams and coastal areas.	Oldsquaw were a source of food.	Lockerby, 2004
Columbidae (generic)	Wild Pigeon, **Pŭles'* **Ples*	Common throughout the province in farmlands and residential or urban areas.	Wild pigeons were a source of food.	VanWart, 1948
Gallinago gallinago	Common Snipe, **Oonŏkpŭdeĕg'isoo* **Jijikwatej*	Found in coastal areas, particularly wet meadows or bushy swamps.	Snipe were a source of food.	VanWart, 1948
Laridae (generic)	Gull,	Found in coastal areas around the province	Gulls were a source of food.	Lockerby, 2004

[7] DeBlois, 1997; Rand, 1888

Species	Common Name, *Mi'kmaw Name[7]	Habitat	Mi'kmaq Traditional Uses	Source
	*Kŭlokŭndeĕch'			
Mergus merganser	Merganser, N/A	Wetlands, lakes, rivers, streams and coastal areas.	Mergansers were a source of food.	Lockerby, 2004
Perdix (generic)	Partridge, *Pŭlowwĕch' *Plawej	Hardwood or mixed forest areas, near streams or openings.	Partridge was a source of food.	Maxwell, 1993; VanWart, 1948
Phalacrocoracidae	Cormorant, *Mqatawapu	Coastal areas around the province	Cormorants were a source of food.	Lockerby, 2004
Somateria mollissima	Common Eider, N/A	Coastal areas near shellfish beds.	Eider was a source of food.	Lockerby, 2004

2.3.4 Marine Species

Table 4 summarizes Mi'kmaq use of salt water marine species, as well as anadromous species principally found in ocean environments. Similar to freshwater species, many of the fish listed in this table were used primarily as a food source, although large marine mammals such as whales and seals offered multiple uses. A large portion of the Mi'kmaq diet consisted of seafood, and while the study areas are not directly adjacent to the coast it is important to note these uses as seasonal variations and migrations of these species played a large role in determining how and when the people moved across the land.

Table 4: Mi'kmaq Marine Species Use

Species	Common Name, *Mi'kmaw Name[8]	Habitat	Mi'kmaq Traditional Uses	Source
Acipenser oxyrhynchus oxyrhynchus	Atlantic Sturgeon, *Komkŭdămoo *Komkotamu	Anadromous fish found in coastal waters and rivers.	Sturgeon were a source of food.	Barsh, 2002; Caplan, 1978; Davis, 1997; Lockerby, 2004; McNab, 1998;

[8] DeBlois, 1997; Rand, 1888

Species	Common Name, *Mi'kmaw Name[8]	Habitat	Mi'kmaq Traditional Uses	Source
				Wicken, 1994
Alosa pseudoharengus	Alewife, (Gaspereau) **Abit petŭbĕt'* **Segoonŭmĕkw'* **Kaspalaw*	Anadromous species found in lakes rivers and coastal waters.	Alewife were a source of food.	Caplan, 1978; McNab, 1998; Wicken, 1994
Bivalvia (generic)	Clam, **Āās*; *Ā'sŭk* **Ŭpkwāāsk* **Sebooāās* **Boogoonŭmowāās* *E:*sik*	Gravel and sand beaches in protected bays.	Clams were a source of food.	Barsh, 2002; Caplan, 1978; VanWart, 1948
Brachyura (generic)	Crab, **Nŭmjimegĕch'* **Jakej*	A variety of crab species are found in Nova Scotia's coastal waters.	Crabs were a source of food.	Barsh, 2002; Caplan, 1978; VanWart, 1948
Buccinidae (generic)	Whelk, N/A	Found in coastal waters with muddy or sandy bottoms.	Limpets were a source of food.	Barsh, 2002
Cardiidae (generic)	Cockles N/A	Found in coastal waters on muddy or rocky bottoms.	Cockles were a source of food.	Barsh, 2002
Cetacea (generic)	Whale, **Năbeák'* **Put'p*	A variety of whales are found in Nova Scotia's coastal waters.	Whales were used as a food source, fat was stored as oil and bones were used for tool making.	Barsh, 2002; Lockerby, 2004
Clupea harengus	Atlantic Herring, **Agoogŭmĕkw'* **N'me*:ji:j	Migratory species found in coastal waters of Nova Scotia.	Herring were a source of food.	Barsh, 2002; Caplan, 1978; Krieger, 2002
Cottidae (generic)	Sculpin, **Kŭlok* **Klakw*	Demersel fish found in waters along the Atlantic Coast.	Sculpin were a source of food.	Barsh, 2002
Echinoidea (generic)	Sea Urchin, N/A	Coastal areas with shallow rocky bottoms	Urchins were a source of food.	Barsh, 2002; Caplan, 1978
Gadus morhua	Atlantic Cod, *Pějoo **Peju*	Benthopelagic fish found in coastal waters.	Cod were a source of food and medicine.	Barsh, 2002; Caplan, 1978; Davis, 1997; McNab, 1998;

Species	Common Name, *Mi'kmaw Name[8]	Habitat	Mi'kmaq Traditional Uses	Source
				VanWart, 1948; Wallis, 1922; Wicken, 1994
Hippoglossus (generic)	Halibut, *'*Msânĕkw'*	Benthic species found in coastal waters	Halibut were a source of food.	Caplan, 1978; Lockerby, 2004
Hippoglossoides platessoides	Plaice, N/A	Benthic species found in coastal waters	Plaice were a source of food.	Caplan, 1978
Homarus americanus	American Lobster, **Wŏlŭmkwĕch';* **Chŭgĕch'* **Jakej* **Walumkwej*	Rocky bottoms in coastal waters.	Lobsters were a source of food, and the claws were used as pipes.	Barsh, 2002; Caplan, 1978; Maxwell, 1993; VanWart, 1948
Mallotus villosus	Capelin, N/A	Migratory species found in coastal waters. Spawn on rock and sand beaches	Capelin were a source of food.	Caplan, 1978
Microgadus tomcod	Tomcod, **Poonămoo* **Punamu*	Found in coastal waters of Nova Scotia.	Tomcod were a source of food.	Davis, 1997; Caplan, 1978; Davis, 1997
Odobenus rosmarus rosmarus	Atlantic Walrus , N/A	Large areas of shallow, open water with abundant clam community near ice or low, rocky shores with steep subtidal zones.	Walrus were a source of food.	Barsh, 2002; Caplan, 1978
Osmeridae (generic)	Smelt, **Kákpāsow'* **kaqpesaw*	Anadromous species found in coastal waters, rivers, and streams.	Smelt were a source of food.	Barsh, 2002; Caplan, 1978; Davis, 1997; McNab, 1998; VanWart, 1948
Ostreidae (generic)	Oyster, **Nŭmtŭmoo'* **M'ntmu*	Marine or brackish intertidal zones	Oysters were a source of food and were also used to polish bows.	Maxwell, 1993; Wicken, 1994
Patellogastropoda (generic)	Limpet, N/A	Found in intertidal rocky zones.	Limpets were a source of food.	Barsh, 2002
Pectinidae (generic)	Scallop, **Sâkskalāās* **Sasqale:s*	Sea scallops live in deep waters with sandy bottoms, while bay scallops live in sandy bays and estuaries.	Scallops were a source of food.	Barsh, 2002; Caplan, 1978; VanWart, 1948

Species	Common Name, *Mi'kmaw Name[8]	Habitat	Mi'kmaq Traditional Uses	Source
Pinnipedia (generic)	Seal, **Wŏspoo* **Waspu*	Found in coastal waters, bays, harbours, estuaries and islands.	Seals offered a source of good and oil, and were also used in medicines.	Barsh, 2002; Caplan, 1978; Davis, 1997; Krieger, 2002; Lockerby, 2004; Maxwell, 1993; VanWart, 1948; Wicken, 1994
Pleuronectidae (generic)	Flounder, **Anagwāāch* **Anakwe:j*	Benthic species found in coastal waters.	Flounder were a source of food.	Barsh, 2002; Caplan, 1978
Pseudopleuronectes americanus	Winter Flounder, N/A	Benthic species found in coastal waters.	Winter flounder were a source of food.	Caplan, 1978
Pteriomorphia (generic)	Mussel, **Sipuwe*:s	Found in rocky intertidal zones.	Mussels were a source of food.	Barsh, 2002; Caplan, 1978; VanWart, 1948; Wicken, 1994
Rajidae (generic)	Skate, **Kĕgŭnălooĕch'* **Na'qum*	Found in coastal waters of Nova Scotia.	Skate were a source of food.	Barsh, 2002; Caplan, 1978
Scomber scombrus	Atlantic Mackerel, **Agoogŭmĕkw'* **N'me:ji:j*	Migratory pelagic fish found in coastal waters and estuaries.	Mackerel were a source of food.	Barsh, 2002; Caplan, 1978
Teuthida (generic)	Squid, **Sedaasoo* **Seta:su*	Found in deep water coastal areas.	Squid were a source of food.	Caplan, 1978
Xiphias gladius	Swordfish, **Keneskooněch'* **Kniskunej*	Migratory fish found in coastal waters of Nova Scotia.	Swordfish were a source of food.	Barsh, 2002

2.4 Traditional Plant Uses

Plants, alongside other natural resources, continue to have an intricate role within the Mi'kmaq culture, society and community. The uses of plant species ranged from being major food sources, to providing cures for ailments and providing raw the materials for the construction of tools.

2.4.1 Food Plant Species

Since the colonization of the new world Indigenous societies have shared their knowledge of plant species with newcomers. It has been estimated that some fifty plants useful as food have found their way into our diets as a result of earlier cultivation by Indigenous societies (Hamilton, 1974). Indigenous contributions to the modern Western diet include: corn, fiddleheads, potatoes, squash, berries, tobacco and maple syrup. For example, the Mi'kmaq were the first to produce maple syrup by facilitating the sap run using reeds or pieces of bark to collect sap into birch bark containers, which were sealed with pine resin for waterproofing (Hamilton, 1974). Table 5 references plant species that were traditionally consumed for food purposes by the Mi'kmaq.

Table 5: Plant Species Traditionally Consumed for Food by Nova Scotia Mi'kmaq.

Scientific Name	Common Name (*Mi'kmaw Name[9])	Habitat	Mi'kmaq Traditional Uses	Source
Abies balsamea	Balsam Fir **Stoqn*	Various	Bark used for beverage and medicine	Speck and Dexter, 1951; Lacey, 1977
Acer pensylvanicum	Striped Maple; Moosewood; * *Mimkutaqo'q*	Rocky woods, rich deciduous forests, wooded slopes and along streams	Bark used for tea	Speck and Dexter, 1951, 1952; Lacey, 1977; Wallis and Wallis 1955
Acer saccharum	Sugar Maple; * *Snawey*	Well-drained soils	Sap boiled into syrup, and a beverage tea was made from the bark and twigs, Used as cooking broth	Speck and Dexter ,1951; Stoddard ,1962

[9] DeBlois, 1996

Scientific Name	Common Name (*Mi'kmaw Name[9])	Habitat	Mi'kmaq Traditional Uses	Source
Acorus americana	Sweetflag[10]; * *kiw'eswa'skul*	Wet places and the borders of quiet streams. marshes, the edges of ponds and wet meadows. Coastal marshes just above high tides.	Rootstocks used to make a beverage and medicinal tea. Tubers eaten raw, or more commonly boiled or roasted	Yanovsky, 1936; Speck and Dexter, 1951; Wallis and Wallis 1955; Lacey, 1977
Allium tricoccum	Wild leek	Rich deciduous forests and intervals	Bulbs, fresh and dried	Speck and Dexter, 1952; Stoddard, 1962
Apios americana	Groundnut	Thickets and along rivers in alluvial soils	Groundnuts used	Speck and Dexter, 1951
Aralia nudicaulis	Wild Sarsaparilla; * *Wopapa'kjukal*	Dry woodlands and old forests	Used to make a beverage.	Speck and Dexter, 1951
Arctostaphylos uva-ursi	Bearberry * *Kinnickick*	Sandy or gravelly soils	Berries eaten	Speck and Dexter, 1951, 1952
Asclepias syriaca	Common Milkweed	Light soils	The young shoots, stems, flower buds, immature fruits, and even the roots were boiled and eaten as a vegetable The Mi'kmaq cooked the young pods and flowers with meat	Stoddard, 1962
Betula alleghaniensis	Yellow Birch; * *Nimnoqn*	Various	Drank sap, rendered it into syrup and sugar, made tea from the twigs	Waugh, 1916; Stoddard, 1962; Lacey, 1977
Chenopodium album and closely related species	Lambsquarters; Pigweed; Goosefoot	A weed of cultivated and waste ground	Leaves and plants eaten as green, edible greens and seeds. The young plants were cooked as a potherb	Speck and Dexter, 1951, 1952
Cornus sericea ssp. sericea	Red Osier Dogwood; Red Willow; * *Wjkulje'manaqsi*	The edges of intervals, brook sides, wet meadows, and ditches along roadsides. Most common in rich, alkaline soils	Mi'kmaq people made a tea from the bark of dogwood probably this species.	Wallis and Wallis, 1955
Corylus cornuta	Beaked Hazelnut; * *Malipqwanj*	Dry and open woods. Sometimes in climax forests, scattered along roadside	Nuts used	Speck and Dexter, 1951, 1952; Stoddard, 1962

[10] Many references mention Calamus or Sweetflag, *A. calamus*, which does not occur in the Maritime provinces. The species present in this region is actually *A. americana*.

Scientific Name	Common Name (*Mi'kmaw Name[9])	Habitat	Mi'kmaq Traditional Uses	Source
		thickets, along edges of fields and along margins of woods.		
Crataegus spp.	Thornapple; Hawthorn; **kawiksa'qoaqsi*	Various, depending on species	Fruit used fresh and to make beverage	Rousseau, 1945; Speck and Dexter, 1951, 1952; Black, 1980; Speck and Dexter, 1951, 1952; Adney, 1944
Erythronium americanum	Trout Lily; Dogtooth Violet	Upland woods of beech and maple, and along the edges of intervals	Bulbs eaten raw, boiled, or baked in the hot ashes of a fire	Stoddard, 1962
Fagus grandifolia	American Beech	Fertile uplands, rarely in swamps	Nuts used	Speck and Dexter, 1951, 1952
Fragaria virginiana , F. vesca	Virginia and Woodland Strawberries ** Atuomkminaqsi*	Old fields and road sides	Berries used fresh or preserved, or made into beverage	Speck and Dexter, 1951; 1952; Adney, 1944; Rousseau, 1945
Fraxinus pennsylvanica	Red Ash	Near lakes or ponds, or in other low-lying areas	Sap of ash was added to maple and yellow birch sap	Stoddard, 1962
Gaultheria procumbens	Wintergreen; Teaberry; Checkerberry; ** Ka'qaju'mannaqsi*	Woods, barrens, pastures	Berries eaten , Mi'kmaq were said to make juice from the berries	Stoddard, 1962; Speck and Dexter, 1952; Lacey, 1977
Gaylussacia sp.	Huckleberry	Barrens and bogs	Berries eaten	Waugh, 1916; Speck and Dexter, 1951, 1952
Hamamelis virginiana	Witch-hazel	Rocky woods or near cliffs where there is underground water	A decoction of this plant, sweetened with maple sugar, was used as a tea. Also ate the "nuts". Twigs used for beverage	Waugh, 1916; Stoddard, 1962; Lacey, 1977
Helianthus tuberosus	Jerusalem Artichoke	Waste ground, intervales, rich soils	Tubers eaten.	Speck and Dexter, 1951
Juglans cinerea	Butternut	NOT IN NS	Nuts used	Speck and Dexter, 1951
Juniperus communis	Low Bush; Common Juniper; **Kini'skweji'jik; kinikwejitewaqsi*	Sandy areas, old pastures, heaths and bogs	Boughs, with or without the fruits, were used to make a beverage tea	Wallis and Wallis, 1955; Lacey, 1977
Lathyrus maritimus	Beach Pea; **Alawey*	Coastal, along the strand line, mostly in beach gravel. Occasionally a considerable	Pea used	Speck and Dexter, 1951, 1952

Scientific Name	Common Name (*Mi'kmaw Name[9])	Habitat	Mi'kmaq Traditional Uses	Source
		distance from shore		
Matteuccia struthiopteris	Ostrich Fern; * *Ma'susi'l*	Rich, moist soils, often on floodplains. Occasionally in low-lying areas and swamp borders. Often in pure stands	The young vegetative shoots, or "fiddleheads," and sometimes the entire crown, were traditionally eaten, boiled or roasted, as a spring vegetable	
Mitchella repens	Partridge Berry	Moist places, forest ground cover	Berries were eaten fresh or preserved. Used the plant for a beverage tea	Speck, 1917; Speck and Dexter, 1951, 1952,
Picea glauca	White Spruce; Cat Spruce; * *Kawatkw; kawtk*	Old fields and along the coast	Bark used for beverage and medicine	Speck and Dexter, 1951; Wallis and Wallis, 1955;Stoddard, 1962; Lacey, 1977
Picea mariana	Black Spruce; Bog Spruce; * *Kawatkw*	Bogs, swamps and poorly drained areas	The bark of black spruce was used to make a beverage or medicinal tea by the Mi'kmaq of the Maritimes	Speck and Dexter, 1951; Wallis and Wallis, 1955; Lacey, 1977
Pinus strobus	Eastern White Pine	Bogs, swamps and poorly drained areas	Bark used for beverage, Inner bark grated and eaten	Speck and Dexter, 1951; Wallis and Wallis, 1955; Lacey, 1977
Prunus americana	American plum	Does not occur in NS, suspected to be received in trade from outside region (Leonard 1996)	Fruit and beverage	Speck and Dexter, 1951,1952; Leonard, 1996
Prunus spp.	Wild Cherries	Thickets, clearings and open woods	Boiled cherry twigs and bark for tea	Stoddard, 1962; Lacey, 1977; Speck and Dexter, 1951, 1952; Adney, 1944
Quercus sp.	Oak	In light or well drained soils and granitic areas	Nuts used	Speck and Dexter, 1951, 1952
Rhexia virginica	Handsome Harry; Meadow Beauty	Peaty lake margins and swales or wet thickets	Leaves were steeped to produce a sour drink	Speck, 1917; Lacey, 1977
Rhododenrdon (syn. Ledum) groenlandicum	Labrador Tea; * *Apuistekie'ji'jit*	Bogs, wooded swamps, wet barrens, and poorly-drained clearings and pastures	The leaves, and sometimes the whole leafy twigs and flowers, of both species were used, fresh or dried, for tea	Speck, 1917; Speck and Dexter, 1951,1952; Wallis and Wallis, 1955; Stoddard, 1962; Lacey, 1977
Ribes americanum	Wild Black Currant	Fertile thickets and slopes	Berries eaten fresh or dried and preserved	Speck and Dexter, 1951, 1952

Scientific Name	Common Name (*Mi'kmaw Name[9])	Habitat	Mi'kmaq Traditional Uses	Source
Ribes spp.	Wild Gooseberry; Currant	Various, depending on species	Fruit	Speck and Dexter, 1951, 1952
Rubus canadensis	Canada Blackberry; * *Ajioqjominaqsi*	Clearing, thickets, and the edges of woods.	Berries used fresh or preserved, made into beverage	Waugh, 1916; Gilmore, 1933, Speck and Dexter, 1951, 1952; Arnason et al., 1981
Rubus idaeus	Red Raspberry; * *Klitawmanaqsi'k*	Roadsides, deforested land, talus slopes, and rocky ground	Berries used fresh or dried, juice made from berries	Speck and Dexter, 1951, 1952; Stoddard, 1962
Rubus sp.	Blackberry	Various, depending on species	Fruit & beverage	Speck and Dexter, 1951, 1952
Sambucus nigra	European Elder; * *Pukulu'skwimanaqsi'l*	Rich soil, open woods, around old fields and along brooks. On damp ground or wet floodplains	Berries were eaten fresh or dried for winter storage	Speck and Dexter, 1951, 1952; Stoddard, 1962
Sambucus racemosa	Red Elderberry; * *Pukulu'skwimanaqsi'l*	Meadows, wet places, rocky hillsides and along streams. In rich soils	The juicy, tart berries were eaten fresh or dried for winter storage	Speck and Dexter, 1951, 1952
Taraxacum officinale	Common Dandelion	An aggressive weed in lawns, pastures, and even cultivated soil.	Young leaves eaten raw or cooked	Rousseau, 1945; Speck and Dexter, 1951, 1952
Taxus canadensis	Canada Yew	Cool damp woods, ravines, climax coniferous forest, and wooded swamps.	Twigs made into beverage	Lacey, 1977
Tsuga canadensis	Eastern Hemlock	Lakesides and swamps or old pastures, northern slopes or ravines	The inner bark of was grated and eaten by the Mi'kmaq of the Maritimes, and the bark was also used as a beverage and medicinal tea	Speck and Dexter, 1951; Wallis and Wallis, 1955; Stoddard, 1962; Lacey, 1977
Vaccinium spp.	Blueberries; Bilberries; Cranberries	Various, depending on species	Berries used fresh or dried and also the Mi'kmaq made juice from blueberries and bilberries for drinking, but did not state which species were involved.	Speck and Dexter, 195 1,1952; Adney, 1944; Lacey, 1977
Vaccinum macrocarpon	Large -fruited Cranberry	Bogs	Berries eaten fresh	Waugh, 1916; Speck and Dexter, 1951,1952; Stoddard, 1962; Black, 1980
Vaccinum. vitis-idaea	Foxberry; Mountain Cranberry;	Cooler regions, such as exposed, coastal headlands	Berries	

Scientific Name	Common Name (*Mi'kmaw Name[9])	Habitat	Mi'kmaq Traditional Uses	Source
	* *Poqomannaqsi*	and barrens		
Viburnum opulus	Highbush Cranberry; * *Nipanmaqsi'l*	Swamps and along streams	Berries used fresh or in preserve	Speck and Dexter, 1951, 1952

2.4.2 Medicinal Plant Species

Diverse healing systems have developed throughout the world. Although these systems differ greatly in their methods, they are based on the common goal of maintaining the human condition in a state of health (Cook, 2005). Throughout history and today, the Mi'kmaq have learned to use various plant species for medicinal purposes and other uses. This knowledge and use of natural resources is informally passed on from generation to generation. The transfer of knowledge between generations is an important cultural component within Indigenous cultures, in particular amongst the Mi'kmaq. Furthermore, this knowledge acts as a mechanism in which Indigenous communities are able to form a spiritual understanding of the balance between people and their local environment.

Early records indicate that the pre-contact Mi'kmaq society did not require drug therapy as used in modern Western medicine, as good health was generally the natural state of the people (Lacey, 1993). The Mi'kmaq had developed an in-depth and intimate knowledge of local plants, and how they could be used for sustenance, and in some cases, to cure illnesses. Shamans treated serious illnesses, while minor external injuries were dressed with medicines derived from plants, trees and animals parts. Many of these remedies were cures, while others were preventive medicines and others, if not used properly, could be poisonous (TEWC, 1999). As the Mi'kmaq began to experience frequent contact with Europeans they were exposed to new illnesses and their general health conditions began to deteriorate. These harsh conditions drew out the resourcefulness of the Mi'kmaq as they gradually acquired remedies to combat ailments, which were unknown a few generations earlier (Lacey, 1993).

The Mi'kmaq have a long history of territorial occupation by immigrant populations, making them one of the most studied people for the use and knowledge of their traditional medicines (Speck, 1917; Wallis and Wallis, 1955). As a result a number of guidebooks have been published on the subject. Table 6 provides a list of plant species known to be used for medicinal purposes by Mi'kmaq, which may be present in the Study Area.

Table 6: Plant Species Traditionally Used for Medicinal Purposes by Nova Scotia Mi'kmaq.

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Abies balsamea	Balsam Fir; * *Stoqn*	Various regions including mountains, canyons and valleys	Balsam used as sore and wound dressing	Le Clerc, 1910
			Balsam used to treat broken bones	Dièreville, 1933
			Bark used for beverage and medicine	Speck and Dexter, 1951; Lacey, 1977
			Buds used as a laxative	Chandler et al., 1979
			Buds, cones and inner bark used for diarrhea	Chandler et al., 1979
			Colic: cones used	Wallis, 1922
			Cones used for colic	Chandler et al., 1979
			Gum used for bruises, sores and wounds	Chandler et al., 1979
			Gum used for burns	Chandler et al., 1979
			Gum used for colds	Chandler et al., 1979
			Sores, swelling: boil inner bark	Speck, 1917
			Used to treat asthma, colds, colic, coughs, congestion, cuts, flu, sores, sore throat, tuberculosis, ulcers	Lacey, 1993
Acer alba	White Maple; Silver Maple; River Maple; Swamp Maple; *Snawey	Planted in urban areas, commonly found on stream banks, flood plains and lake edges.	Bark used as a cough remedy	Chandler et al., 1979

[11] DeBlois, 1996; Wallis and Wallis, 1955

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Acer pensylvanicum	Moosewood; Striped Maple; Moose Maple; *Mimkutaqo'q; snawey	Minor component in a hardwood forests, tolerant of shade, responds well to increased sunlight	Bark tea used for colds, coughs, influenza	Wallis, 1922
			Bark used for colds	Chandler et al., 1979
			Bark used for coughs	Chandler et al., 1979
			Bark used for medicinal tea	Speck and Dexter, 1951; Lacey, 1977; Wallis and Wallis, 1955
			Wood used for kidney trouble	Chandler et al., 1979
			Wood used for spitting blood	Chandler et al., 1979
Acer saccharum	Sugar Maple; *Snawey	Grows in rich, mesic sites, but also occurs in drier upland forests. Commonly found near American beech, American basswood, northern red and white oak, birch and yellow poplar	Bark used	Speck and Dexter, 1951
Acer sp.	Maple; *Snawey	Found in a variety of diverse regions	Cold, congestion, conjunctivitis, swelling	Lacey, 1993
Acer spicatum	Mountain Maple	Found scattered in the shrub layer of climax forests. Common in upper elevations	Bark used for sore eyes	Chandler et al., 1979
Achillea millefolium	Common Yarrow	Dry or sandy soils as well as damp, salty soils. Pastures, meadows, roadsides, streamsides, and disturbed areas	Bruises, cold, fever, sprain, swelling	Lacey, 1993
			Decoction of plant taken with milk to cause a sweat for colds	Wallis, 1922
			Dried, powdered bark or green leaves rubbed over bruises	Wallis, 1922

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
			Dried, powdered bark or green leaves rubbed over swellings	Wallis, 1922
			Herb used for colds	Chandler et al., 1979
			Sprains	Wallis, 1922
Acorus americanus (frequently misidentified as A. calamus in many references)*	Sweet Flag; Flagroot; Muskrat Root; Calamus; *Kiw'eswa'skul; ki'kwesu'sk*	Growth in marshes, quiet streams and wet meadows	Root used for beverage and medicine	Speck and Dexter, 1951; Wallis and Wallis, 1955
			Root used for colds	Chandler et al., 1979
			Root used for coughs	Chandler et al., 1979
			Use to treat colic, Cholera, Cough, Belching, Cramps, Preventive, Stomach Cramps, Gastrosis, Preventive	Lacey, 1993
Actaea racemosa var. racemosa	Black Bugbane	Grows in a variety of woodland habitats, found in small woodland openings	Root used for kidney trouble	Chandler et al., 1979
Aletris farinosa	White Colicroot	Low crowing perennial herb, found in open dry habitats associated with tall-grass prairies	Root used as a stomachic	Chandler et al., 1979
			Root used as an emmenagogue	Chandler et al., 1979
			Stomachic tonic, emmenagogue: root used	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Alnus crispa	Alder; *Tupi; Tupsi	Lakeshores and associated swampy areas	Cathartic, cramps, depurative, diptheria, fever, gastrosis, lameness, nephrosis, neuralgia, pain, rheumatism, wounds	Lacey, 1993
Alnus sp.	Alder; *Tupi; Tupsi	Lakeshores and associated swampy areas	Bark and leaves used for festers and bark used for wounds	Chandler et al., 1979
			Bark and leaves used for fevers and festers	Chandler et al., 1979
			Bark used as a physic	Chandler et al., 1979
			Bark used for bleeding	Chandler et al., 1979
			Bark used for cramps	Chandler et al., 1979
			Bark used for retching	Chandler et al., 1979
			Bark used for rheumatism	Chandler et al., 1979
			Bleeding, hemorrhage of lungs, fever, fractures, diphtheria,	Chandler et al., 1979
Anaphalis interecedens	Everlasting	Fields, roadsides, and the border of woods	Fumitory, smoked with tobacco	Lacey, 1993
Angelica sylvestris	Woodland Angelica	Tall plants of moist habitats with dilated sheaths. Found in open or woodland habitats	Infusion of roots and spikenard roots used for coughs	Mechling, 1959
			Infusion of roots and spikenard roots used for head colds	Mechling, 1959
			Root used for cough	Chandler et al., 1979
			Root used for head cold	Chandler et al., 1979
Antennaria neodioica	Everlasting	Fields, roadsides, and the border of woods	Fumitory; dried broken into fine pieces and mixed with tobacco or smoked by themselves	Lacey, 1993

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Apocynum cannabinum	Indian Hemp; Worm Root	Found along roadsides, in thickets, fields, waterways, fields and in disturbed regions	Root used as a vermifuge Used internally as a tea to treat worms	Chandler et al., 1979 Lacey, 1993
Aralia nudicaulis	Wild Sarsaparilla; * *Wopapa'kjukal*	Shady, wooded areas, ranging from moist to dry regions	Cold, cough, flu, wounds	Lacey, 1993
			Cough: root used	Chandler et al., 1979
			Plant used, ailment not provided	Speck and Dexter, 1951
			Root used as a cough medicine	Chandler et al., 1979
Aralia racemosa	American Spikenard	Grows on rocky but highly fertile riverbanks	Colds: steep roots	Lacey, 1977
			Colds, sore eyes, wounds: root	Wallis, 1922
			Infusion of roots and angelica roots used for coughs	Mechling, 1959
			Infusion of roots and angelica roots used for head colds	Mechling, 1959
			Root used for colds	Chandler et al., 1979
			Root used for coughs	Chandler et al., 1979
			Root used for female pains	Chandler et al., 1979
			Root used for headaches and female pains	Chandler et al., 1979
			Root used for kidney troubles	Chandler et al., 1979
			Root used for sore eyes	Chandler et al., 1979
			Root used for spitting blood	Chandler et al., 1979
			Root used for wounds	Chandler et al., 1979
Arctium lappa	Greater Burdock;	Disturbed sites, roadsides and pastures	Buds and roots used for sores	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
	*Kawiksaw; Kelikwet			
Arctium minus	Lesser Burrdock: *Kawiksaw; Kelikwet	Disturbed sites, roadsides and pastures	Depurative, dermatosis, tonic	Lacey, 1993
			Roots used for boils and abscesses	Chandler et al., 1979
Arctostaphylos uva-ursi	Bearberry *Kinnickick	Gravel type or sandy soils	Fumitory, urinary antiseptic	Lacey, 1993
Arisaema triphyllum	Indian turnip; jack-in-the-pulpit; *Tanaps; Wennju:sukapun	Predominate in loose soils and wet woods	Cold, gastrosis, tuberculosis	Lacey, 1993
			Parts of plant used for boils and abscesses	Chandler et al., 1979
			Stomach: root bulb, tuberculosis: root bulb, method not mentioned	Lacey, 1977
Aristolochia serpentaria	Virginia Snakeroot	Found in dry-mesic forests above streams or wetlands	Root used for fits	Chandler et al., 1979
Armoracia rusticiana	Horse Radish, Hot Root, Eptekeway	Old gardens	Digestive, inappetance, stomach	Lacey, 1993
Asarum canadense	Canadian Wildginger	Low growing woodland plants, found in moist, humus rich soils of slowing woodland habitats	Root used for cramps and as a stomachic	Chandler et al., 1979
Asclepias spp.	Milkweeds	Growth in light, sandy soils and an abundant amount of sunlight	Root steeped and used as an emetic	Le Clerc, 1910
Asclepias syriaca	Milkweed	Growth in light, sandy soils and an abundant amount of sunlight	Used to treat poison ivy	Lacey, 1993
Baptisia tinctoria	Horseflyweed	Increases in burnt fields, dry open woods and clearings, sandy acidic soil	Root used for kidney trouble	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
			Root used for spitting blood	Chandler et al., 1979
Betula alleghaniensis	Yellow Birch; *Nimnoqn; puku;skw	Various regions including mountains, canyons and valleys	Bark tea used for diarrhea	Lacey, 1977
			Twigs used for tea	Lacey, 1977
			Used for cramps, diarrhea, dyspepsia, gastrosis, cramps, cramps, rheumatism	Lacey, 1993
			Wood used as hot-water bottle	Chandler et al., 1979
Betula populifolia	Gray Birch	Found in dry barren uplands, also moist soils, in mixed woodlands	Inner bark used an an emetic	Chandler et al., 1979
			Inner bark used as an emetic	Chandler et al., 1979
			Inner bark used for infected cuts	Chandler et al., 1979
Brassica hirta	White Mustard	Found in openings in mesic forests, but also in riparian floodplains, margins of fens, marshes and streams, and wet meadows, fields and pastures	Tuberculosis of lungs (no part mentioned)	Chandler et al., 1979
Brassica napus	Wild Turnip, Rape; * *tanaps; wennju:-sukapun; wennju:s'pekn*	Found in fields, vegetable gardens, mills, roadsides, loading areas, and rubbish tips	Bark used for colds	Chandler et al., 1979
			Bark used for coughs	Chandler et al., 1979
			Bark used to treat colds, cough, grippe, smallpox	Wallis, 1922
Chelone glabra	White Turtlehead	Found in open woodlands in floodplain areas, thickets in floodplain areas, wet prairies, sedge meadows, seeps, springs, marshes and fens	Herb used to prevent pregnancy	Chandler et al., 1979
Chimaphila umbellata	Pipsissewa, Prince's Pine	Found in coniferous and mixed forests with numerous tree species and dry soils.	Herb used as a blood purifier	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
	*Kuwow			
			Herb used for blisters	Chandler et al., 1979
			Herb used for kidney trouble	Chandler et al., 1979
			Herb used for kidney trouble and rheumatism	Chandler et al., 1979
			Herb used for rheumatism	Chandler et al., 1979
			Herb used for stomach trouble	Chandler et al., 1979
			Jsed as stomach medicine and for tuberculosis	Lacey, 1977
			Used for kidney pains	Rousseau, 1948
			Used for tuberculosis	Lacey, 1993
Chrysanthemum	Field Daisy	Found in gardens, grassy temperate climate, rainfall and sunlight	Used for conjunctivitis	Lacey, 1993
Clintonia borealis	Northern Clintonia	Found in rich coniferous and mixed wood stands, thickets	Root decoction used to treat "gravel" (kidney stones)	Speck, 1917
Comptonia peregrina	Sweet Fern; *masoose	Shrub and brushlands, grasslands, and in open or barren soils	Boils, dermatosis, poison ivy, rheumatism, sore, tonic	Lacey, 1993
			Leaf tea used as tonic	Lacey, 1977
			Leaves used for posion ivy	Chandler et al., 1979
			Leaves used for sprains, swellings, poison ivy and inflammation	Chandler et al., 1979
			Leaves used for swellings and poison ivy	Chandler et al., 1979
			Root used for headache and inflammation	Chandler et al., 1979
Coptis trifolia	Goldthread; * *wisowtaqjijl;*	Coniferous forests and damp areas such as swamps, hummocks on bogs and	Roots used for sore eyes, root tea uses as stomach medicine	Lacey, 1977

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
	malj:japa:qawey	roadside banks		
			Used for chafing, diabetes, diarrhea, lack of appetiite, stomatosis, stomach cancer, also used as a tonic	Lacey, 1993
Cornus canadensis	Bunchberry, Dwarf Dogwood; * *ŭsogomanŭl*	Various locations; largely in woodlands and scattered throughout bogs	Berries, roots and leaves used forseizures	Chandler et al., 1979
			Leaf tea used for bed wetting and kidney ailments	Lacey, 1977
			Used for enuresis, gastrosis, hemorrhage, nephrosis, wounds	Lacey, 1993
Cornus sericea ssp. sericea	Redosier Dogwood; Red Willow; **Wjkulje'manaqsi*	Commonly found in sandy areas, moist sandy thickets, shrub swamps, shrubby bogs, sand areas along rivers, marshes and sandy ditches	Herb used for headache	Chandler et al., 1979
			Herb used for sore eyes	Chandler et al., 1979
Cornus sp.	Dogwood; **ŭchkoolchemoose; oojegŭnŭmoose*	Sunny moist to wet places, often being the first to colonize wet meadows in floodplains	Bark of unidentified species for tea	Wallis and Wallis, 1955
			Fumitory	Lacey, 1993
Cypripedium acaule	Pink Lady Slipper; Moccasin Flower; * *'mtooögwāāch; lipkŭdămoon'*	Requires acidic soil with a fungus association, but can tolerate a variety of shady and moisture rich areas. Prefers well drained slopes an is usually found in pine and deciduous forests	Nervine, tuberculosis	Lacey, 1993
			Nervousness: root decoction	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Daucus carota	Queen Anne's Lace, Wild Carrot; *enmapet; enmapej	Found in fields, meadows, waste places, roadsides, fence rows, and disturbed habitats	Leaves used as a purgative	Chandler et al., 1979
			Purgative: leaves used	Wallis, 1922
Dirca palustris	Leatherwood, Moosewood	Rich deciduous or mixed woods in moist situations often on calcareous soils	Bark tea used for Colds, coughs, influenza	Wallis, 1922
			Seeds steeped and used as Emetic	Le Clerc, 1910
Eupatorium perfoliatum	Common Boneset	Low meadows and damp grounds such as swamps, bogs, and along streams and ditches	Arthritis, Cold, Insomnia, Gastric ulcers, Pain, Tonic	Lacey, 1993
			Parts of plant used for kidney trouble	Chandler et al., 1979
Euphorbia corollata	Flowering Spurge	Found in mesic to dry black soil prairies, sand prairies, gravel prairies and dolomite prairies; openings in upland forests and sandy forests; various kinds of hill prairies	Root used as an emetic	Chandler et al., 1979
Fagus grandifolia	American Beech; *suwo:musi; munkwaqanemusi	Scattered throughout, mainly in dry forest ridges and atop hills	Used for antiseptic, appetite, enteritis, hepatosis, nephrosis, rheumatism, tonic, tuberculosis	Lacey, 1993
Fragaria virginiana	Virginia Strawberry; *Atuomkminaqsi; klitaw	Often found in disturbed areas from dry to moist open woodlands and clearings	Parts of plant used for irregular menstruation	Chandler et al., 1979
			Plant steeped in water and used for cramps, depurative, dysentery, gastrosis, gingivitis, tonic, urinary antiseptic	Lacey, 1993
Fraxinus americana	White Ash; *elikpetamit	Found in moist upland sites	Leaves used for cleansing after childbirth	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Galium aparine	Stickywilly	Found in part shade, shade; moist woods, thickets	Parts of plant used for kidney trouble	Chandler et al., 1979
			Parts of plant used for persons spitting blood and gonorrhea	Chandler et al., 1979
Gaultheria procumbens	Teaberry; **Ka'qaju'mannaqsi; kakaju:man*	Requires acidic or sandy soils, forests, woodlands, old pastures, bogs and road banks	Cardiopathy (Heart attack), Preventitive (Heart attack), Stroke	Lacey, 1993
			Leaves used for tea	Lacey, 1977
Geum aleppicum	Yellow Avens	Found in low ground, moist meadows, swamps	Roots used for coughs and croup	Chandler et al., 1979
Geum rivale	Chocolate Root, Purple Avens; Water Avens	Found in White Cedar fens, bogs, marshes and soggy meadows	Decoction of root taken, especially by children, for colds	Speck, 1917
			Decoction of root taken, especially by children, for coughs	Speck, 1917
			Decoction of root taken, especially by children, for dysentery	Speck, 1917
			Root used for diarrhea	Chandler et al., 1979
			Root used for diarrhea or dysentery	Chandler et al., 1979
Habenaria dilatata	Tall White Bog Orchid	Found in wet areas, bogs	Root decoction used for kidney stones	Speck, 1917
Hamamelis virginiana	Witch Hazel	Understory of deciduous and mixed forests, rocky woods or near cliffs	Understory of deciduous and mixed forests, rocky woods or near cliffs	Lacey, 1993
			Twigs used for beverage	Lacey, 1977

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Heracleum lanatum	Cow Parsnip; **wabegpagosi; pagosi*	On the sides of brooks in alluvial soil and in wet meadows	Root tea used as general preventative medicine	Lacey, 1977
			Used for cold, flu, tuberculosis	Lacey, 1993
Heracleum sphondylium	Eltrot; Hogweed; Rough Cow Parsnip	Common in herbaceous places, along roads, in hedges, meadows and woods, especially in mountain areas, prefers rich in nitrogen, moist soils	Green and light color plant used as medicine for women	Wallis, 1922
			Lighter colour part of plant used as medicine for women, darker coloured part for men (part not explained)	Wallis, 1922
Hierochloe odorata	Sweet Grass; **Kjimskiku; welim'qewe'l msiku*	Upper areas of tidal marshes (moist heavy soils)	Vital spiritual and ceremonial purpose, including smudging, cleansing and purification purposes.	Lacey, 1993
Hydrastis canadensis	Goldenseal	Typically found in shady, rich, mesic southern forests, occurs in moist microhabitats near vernal pools, along forested streams	Root used for chapped or cut lips	Chandler et al., 1979
Hylotelephium telephium ssp. telephium	Witch's Moneybags	Found in dry sites with rocky soil: roadsides, railways, old fields, open woods, clearings, shore lines, swamps, forests, waste places	Leaves used for boils and carbuncles	Chandler et al., 1979
Ilex aquifolium	English Holly	Found in woodland and hedgerows, grows in forests, parks, gardens and in plains and mountain areas	Part of plant used for fevers, root used for consumption	Chandler et al., 1979
			Root used for cough	Chandler et al., 1979
Ilex verticillata	Black Alder; **tupi; tupsi*	Lakeshores and associated swampy areas	Seeds steeped and used as an emetic	Le Clerc, 1910

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Impatiens capensis	Jewelweed	Grows in shady ad wet places	Herbs used for jaundice	Chandler et al., 1979
Inula helenium	Elecampane Inula	Found in fields, waysides, waste places, often on moist soils in shade	Root used for colds	Chandler et al., 1979
			Root used for headaches	Chandler et al., 1979
			Root used for heart trouble	Chandler et al., 1979
Iris versicolor	Blue flag; muskrat root; Harlequin Blue flag; *mooskoonamook'	Wet areas along roadsides, in meadows and along streams and wet coastal regions	Root used for wounds and herb used for sore throat	Chandler et al., 1979
			Root used to treat wounds	Wallis, 1922
			Used as antidote and emetic	Lacey, 1993
Juglans cinerea	Butternut	Commonly found in riparian habitats, found on rich, moist, well-drained loams and well-drained gravels	Bark used as a purgative	Chandler et al., 1979
Juniperus communis	Common Juniper; *Kini'skweji'jik; kinikwejitewaqsi	Rocky and sandy soil environments, old pastures and heaths	Cones used for rheumatism, ulcers	Chandler et al., 1979
			Decoctions of juniper bark, roots, or needlesused to treat a variety of lung-related disorders, from colds to asthma to tuberculosis	Waugh, 1916; Mechling, 1959
			Gum, bark used for sprains, wounds, tuberculosis	Wallis, 1922
			Part of plant used for rheumatism and bark used for tuberculosis	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
			Stems used in hair wash, gum used for wounds and cones used for ulcers	Chandler et al., 1979
			Used for burns, colds, cuts, flu, gastrosis, nephrosis, rheumatism, sore, sprain, tonic, dysuria	Lacey, 1993
Juniperus sp.	Juniper; **Kini'skweji'jik; kinikwejitewaqsi*	Rocky and sandy soil environments, old pastures and heaths	Tips used for beverage	Wallis and Wallis, 1955
Kalmia angustifolia	Lambkill, Sheep Laurel	Bog areas in eastern lowland forests	Coultice of crushed leaves used for headache, leaf decoction used for stomach trouble	Speck, 1917
			Herb used for pain, swellings and sprains	Chandler et al., 1979
			Herb used for swellings, pain and sprains	Chandler et al., 1979
			Plant used as pain killer	Wallis, 1922
			Poultice of crushed leaves bound to head for headache	Speck, 1917
			Used for rheumatism, sore limbs, swelling. Poisonous in large doses	Lacey, 1993
Larix americana	Eastern Larch, Tamarack, Hackmatack	Found in wetlands such as swamps and bogs as well as wet depressions in forests	Bark used for colds	Chandler et al., 1979
			Bark used for suppurating wounds and colds	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
			Boughs brewed into tea and used for sores and swelling, boiled inner bark used as diuretic	Speck, 1917
			Decoction of boughs taken as a diuretic	Speck, 1917
			Poultice of boiled inner bark applied to sores and swellings	Speck, 1917
			Running sores: bark	Chandler et al., 1979
			Used for cold, flu, infections, tuberculosis, wounds	Lacey, 1993
Ledum groenlandicum	Labrador Tea	Thrives in bogs, on wet shores, damp barrens, poorly drained pastures and on rocky alpine slopes	Decoction of leaves taken as a diuretic	Speck, 1917
			Leaf tea used for asthma, cold, scurvy	Chandler et al., 1979
			Leaves used for kidney trouble and to make a beverage	Chandler et al., 1979
			Leaves used for tea	Speck and Dexter, 1951, 1952; Wallis and Wallis, 1955; Lacey, 1977
			Leaves used for the common cold	Chandler et al., 1979
			Tea of plant used for nephrosis, tonic	Lacey, 1993
Leonurus cardiaca	Common Motherwort	Found in open disturbed woodlands, areas along woodland paths, woodland borders and thickets, edges of degraded wetlands	Part of plant used for obstetric cases	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Lilium canadense	Canada Lily	Found in open woodlands, wooded slopes, savannas, woodland openings, and moist meadows	Parts of plant used for irregular menstruation	Chandler et al., 1979
Lilium philadelphicum	Wood Lily	Found in part shade, sun, dry woods, meadows, prairies	Roots used for coughs	Chandler et al., 1979
			Roots used for fever	Chandler et al., 1979
			Roots used for swellings and bruises	Chandler et al., 1979
Lobelia inflata	Indian tobacco; *nutmawey	Found growing naturally in dry pastures, barren areas and meadows	Smoke used to treat earache	Lacey, 1977
			Used for asthma, earache, fumitory	Lacey, 1993
Lycopodium sp.	Club Moss	Found in moist, shaded woodlands	Herb used for fever	Chandler et al., 1979
Maianthemum racemosum	Feather Solomon's Seal	Found in deep, humus-rich, acid soils. Prefers moist, deciduous woods, growing in drier, shallower soils or open spaces	Leaves and stems used for rashes and itch	Chandler et al., 1979
Mentha arvensis	Canadian Mint	Found along forest edge, wet meadows and fields, riparian, swamps/marshes, lakeshores	Herb used for children with an upset stomach	Chandler et al., 1979
Mitchella repens	Partridgeberry, Squaw Vine	Moist and damp regions, and along the ground of forest covered areas	Plant used for beverage and medicine	Speck and Dexter, 1951
			Used for parturition, pregnancy	Lacey, 1993
Myrica gale	Sweet Gale	Found in watersides, bogs, edges of lakes and streams	Roots pounded,soaked in hot water and used for inflammation	Wallis, 1922

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Myrica pensylvanica	Northern Bayberry, Waxberry	Coastal headlands and beaches, swamp and boggy forests, dry rocky forest and semi-open rocky ridges	Headaches: plant, snuff;inflammation: root poultice; exhilarant: tea, berries, bark, leaves	Wallis, 1922
			Used for arthritis, mouthwash, pain, rheumatism, stomatitis	Lacey, 1993
Nicotiana tabacum	Cultivated Tobacco; *nutmawey	For adequate growth found in soils without a high level of nitrogen	Drowning, earache	Lacey, 1993
			Leaves used for bleeding	Chandler et al., 1979
			Leaves used for earache	Chandler et al., 1979
Nuphar advena	Yellow Pond Lily; *pagose	Found in the floating leaved plant community, found in shallow depths, in less than 1 meter of water, in lakes, ponds, and stillwater	Poultice of bruised root with flour or meal applied to swellings and bruises	Speck, 1917
			Swellings of the limbs: leaves	Chandler et al., 1979
			Swellings, bruises: root with flour, poultice	Speck, 1917
Nuphar variegatum	Yellow Water Lily, Big One Side, Cow Lily; *pagose	Wetlands ranging from lakes, ponds and stillwaters	Root brewed into tea or worn around neck as general preventative	Lacey, 1977
			Used for swelling	Lacey, 1993
Nymphaea odorata	American White Waterlily, Sweet-Scented Water Lily; *pagose	Slow moving rivers, lakes and mucky ponds	Juice of root taken for coughs	Speck, 1917
			Leaves used for colds	Chandler et al., 1979
			Poultice of boiled root applied to swellings	Speck, 1917

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
			Root decoction used for coughs, swellings	Speck, 1917
			Roots used for colds, grippe, swelling; leaves used for suppurating glands	Chandler et al., 1979
			Roots used for suppurating glands and leaves used for colds	Chandler et al., 1979
			Used as preventive, swelling	Lacey, 1993
Panax quinquefolius	American Ginseng	Found in woodlands	Roots used as a "detergent for the blood"	Chandler et al., 1979
Panicum capillare	Witch Grass	Growth in disturbed areas, along roadsides, headlands and on lakeshores	Tonic	Lacey, 1993
Phytolacca americana	American Pokeweed; Pigeon-berry	Found in thickets, fields, roadsides and clearings	Leaves used for bleeding wounds	Chandler et al., 1979
			Leaves used for bleeding wounds	Wallis, 1922
Picea glauca	White Spruce; * *Kawatkw; kawtk*	Tolerable of a wide range of moisture conditions, mainly found along the coast and in old fields	Bark used as a cough remedy	Chandler et al., 1979
			Bark used for beverage and medicine	Speck and Dexter, 1951; Wallis and Wallis, 1955
			Bark used to prepare a salve for cuts and wounds	Chandler et al., 1979
			Gum and twigs used for scurvy	Chandler et al., 1979
			Gum used for scabs and sores	Chandler et al., 1979
			Parts of plant used for stomach trouble	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Picea mariana	Black Spruce; * *Kawatkw*	Primarily found on wet organic soils, peat bogs and swamps	Bark used for beverage or medicine	Speck and Dexter, 1951; Wallis and Wallis, 1955;Lacey, 1977
			Bark, leaves, twigs used for colds, cough, grippe; sap used for hemorrh;age, unknown part used for kidney trouble; bark used for wounds	Wallis, 1922
			Colds, cough, grippe, scurvy: bark, leaves, twigs	Chandler et al., 1979
			Cough remedy: bark	Wallis, 1922
Picea spp.	Spruce; *Kawatkw*	Found in boreal regions	Used for tuberculosis, infections, cold, tonic, laryngitis, scurvy, warts	Lacey, 1993
Pinus strobus	Eastern White Pine; * *kuwow; kuwaq*	Thrives on dry/fresh, shallow and stony soils	Bark used for beverage or medicine	Speck and Dexter, 1951; Wallis and Wallis, 1955; Lacey, 1977
			Bark used for wounds and sap used for hemorrhaging	Chandler et al., 1979
			Bark, leaves and stems used for colds	Chandler et al., 1979
			Bark, leaves and stems used for coughs	Chandler et al., 1979
			Boiled inner bark used for sores and swellings	Speck, 1917
			Plant parts used for kidney trouble	Chandler et al., 1979
			Sap used for hemorrhaging	Chandler et al., 1979
			Used for colds, hemorrhage, nephrosis	Lacey,,1993

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Plantago major	Common Plantain	Found in open, disturbed places such as waste areas, as well as in fields and along roads	Leaf poultice used for infected wounds	Lacey, 1977
			Used for gastrosis, sore, infection, sore, ulcer, wound, infection, sore, wound	Lacey, 1993
Polygala senega	Seneca Snakeroot	Found in upland gravel prairies, hill prairies, savannas, wooded slopes along rivers or lakes and abandoned fields	Root used for colds	Chandler et al., 1979
Polypodium virginianum	Rock Polypody	Grows on boulders, cliffs and rocky slopes and does not need well-developed soil	Infusion of plant used for urine retention	Rousseau, 1948
Pontederia cordata	Pickerelweed	Found in shallow water of marshes, swamps, bogs, ponds and protected areas of rivers where the water is slow-moving	Herbs used to prevent pregnancy	Chandler et al., 1979
Populus balsamifera	Balsam Poplar	Found on sites that are relatively rich in nutrients and less acidic, and in relatively small, localized stands	Barked baked, brewed into tea to treat worms	Chandler et al., 1979
			Buds and other parts of plant used as salve forr sores, chancre	Chandler et al., 1979
Populus sp.	Poplar sp.; * *miti*	A variety of diverse habitats (open disturbed sites to grasslands to floodplain woodlands)	Used for cold, flu	Lacey, 1993
			Worms: bake bark, make tea	Lacey, 1977
Populus tremuloides	Quaking Aspen	Occurring alongside conifer trees, grow best in fertile, moist loams or well-draining silts or clay loams.	Bark used for colds	Chandler et al., 1979
			Bark used to stimulate the appetite	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Prunus cerasus	Red Cherry; Sour Cherry	Found in moist, open woods	Used for cold, cough, hypertension	Lacey, 1993
Prunus pensylvanica	Pin Cherry	Dry to moist open forests and clearings	Wood used for chafed skin and prickly heat	Chandler et al., 1979
Prunus serotina	Black Cherry	Found in deciduous woodlands, open woodlands, woodland borders, fence rows, powerline clearances, vacant lots, and waste areas	Bark used for colds	Chandler et al., 1979
			Bark used for coughs	Chandler et al., 1979
			Bark used for smallpox	Wallis, 1922
			Cold, cough, depurative, flu, tonic	Lacey, 1993
Prunus spp.	Wild Cherry; * *maskwesmnaqsi; maskwe:simanagsi*	Open woodland areas, thickets and various clearings	Bark steeped for medicine	Lacey, 1977
			Bark used for beverage and medicine	Speck and Dexter, 1951
Prunus virginiana	Bitterberry, Chokecherry	Found along streams, springs and seeps, intolerant of poor drainage, silty or sandy soils	Bark used for diarrhea	Chandler et al., 1979
			Used for cough, diarrhea	Chandler et al., 1979
Pyrola asarifolia	Liverleaf Wintergreen	Found in calcareous woods, thickets and wetlands	Parts of plant used for kidney trouble	Chandler et al., 1979
			Gonorrhoea, kidney trouble, spitting blood: part not mentioned	Chandler et al., 1979
			Parts of plant used for spitting blood	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Quercus alba	White Oak; **mimkwaqanimusi*	Found on sandy plains, gravelly ridges, rich uplands, coves and well-drained loamy soils	Bark used to induce thirst; treat bleeding piles	Chandler et al., 1979
			Nuts used to induce thirst	Chandler et al., 1979
			Plant parts used for bleeding piles	Chandler et al., 1979
Quercus rubra	Northern Red Oak **mimkwaqanimusi*	Grows on a variety of dry-mesic to mesic sites, occurs in rich, mesic woods, on sandy plains, rock outcrops, stable interdunes, and at the outer edges of floodplains	Bark and roots used for diarrhea	Chandler et al., 1979
Quercus sp.	Oak; **mimkwaqanimusi*	Thrive in both lightly and well drained soils and granitic regions	Used for hemorrhage, piles	Lacey, 1993
Ranunculus acris	Tall Buttercup	Found in various locations such as in ponds, along shores and in meadows	Leaves used for headaches	Chandler et al., 1979
			Used as throat treatment	Chandler et al., 1979
			Used to treat cancer, headache, phobia	Lacey, 1993
Rhexia virginica	Meadow Beauty	Lightly shaded, wet regions such as swamps, higher parts of marshes, peaty lake margins and wet meadows and prairies	Leaves and twigs used as throat cleanser	Wallis, 1922
			Leaves steeped to produce a sour drink	Lacey, 1993
Rhinanthus crista-galli	Yellow Rattle	Typically growth in old fields, along roadsides and in places of prevalent waste	Used for epilepsy, seizures	Chandler et al., 1979
Rhus glabra	Smooth Sumac	Found on the edges of moist to dry black soil prairies, upland forests with a history of disturbance; thickets and woodland borders	Earache: part not mentioned	Lacey, 1993

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
			Used for cough, earache, sore throat	Chandler et al., 1979
Rhus typhina	Staghorn Sumac	Typically found in open areas such as fields, grasslands, along roadsides, hillsides and prairies	Bark and roots used as a physic	Chandler et al., 1979
			Berries and roots used for loss of appetite	Lacey, 1993
Ribes uva-crispa var. sativum	European Gooseberry; *kawaqteik; ka:to:min	Found in rocky hillocks, forest margins, shores	Bark and roots used as a physic.	Chandler et al., 1979
Rubus alleghanensis	Blackberry; * *Ajiyoqjimin; kl'muwejimin*	Easily grown in well-drained loamy soil in sun and semi shade, specifically dry thickets, clearings and woodland margins, open meadows, roadsides.	Used for canker, diarrhea, sore throat, stomach, stomatosis	Chandler et al., 1979
Rubus chamaemorus	Cloudberry	Found in bogs, wet peaty meadows, and tundra	Roots used for cough	Chandler et al., 1979
			Roots used for fever	Chandler et al., 1979
Rubus fruticosus	Shrubby Blackberry; *Ajiyoqjimin	Found in lower rainfall areas	Bark and roots used for children's diarrhea	Chandler et al., 1979
Rubus hispidus	Bristly Dewberry	Found in conifer swamps, wet hardwood forests, thickets and usually in an areas that are shaded, live in drainage ditches, low woods and swampy meadows	Roots used for cough	Lacey, 1993
			Roots used for fever	Chandler et al., 1979
Rubus idaeus	Raspberry; *Klitawmanaqsi'k; klitaw	Rocky grounds, along roadsides, and in exposed lands from deforestation	Used for canker, diarrhea, sore throat, stomach, stomatosis	Lacey, 1977
Rubus pubescens	Dwarf Red Blackberry; *Ajiyoqjimin	Grows in shaded environments and is common in the shaded understory beneath glossy buckthorn	Parts of plant used for irregular menstruation	Chandler et al., 1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Rubus sp.	Blackberry, Raspberry; *Ajiyoqjimin; klitaw	Found in a variety of habitats	Tea from canes used to treat stomach issues, with strawberry runners	Lacey, 1977
Rumex crispus	Curly Dock	Grows as a weed in pastures, hay fields, forages, landscapes, and some crop field areas	Infusion of roots used as a purgative	Mechling, 1959
			Roots used as a purgative	Chandler et al., 1979
			Roots used treat "cold in bladder"	Mechling, 1959
Salix cordata	Heartleaf Willow; Sand Dune Willow; Furry Willow	Found along dunes and lakeshores	Bark used for blisters	Chandler et al., 1979
			Bark used for colds	Chandler et al., 1979
			Bark used to stimulate the appetite	Chandler et al., 1979
Salix discolor	Pussy Willow;	Swamps, stream banks, marsh borders, floodplains and fens	Bruises, cancer, cold, nephrosis	Lacey 1993
Salix lucida	Shining Willow	Found in wetland habitats	Bark used for bleeding	Chandler et al.,1979
			Poultice of bruised leaves used on sprains and bruises	Wallis, 1922
Salix nigra	Black Willow	Found in marsh areas with standing water and most often seen along rivers and small streams, well suited to a riparian habitat	Poultice of scraped root and spirits applied to bruises and sprains	Speck, 1917
Salix sp.	Red Willow	Found in a variety of habitats	Fumitory	Lacey, 1993
Sambucus canadensis	American Elder; *Pukulu'skwimanaqsi'l	Various locations including wet barrens, swamps and open woodland areas	Berries, bark and flower used as a purgative and bark used as a physic	Chandler et al.,1979
			Berries, bark and flower used as a purgative and bark used as an emetic	Chandler et al.,1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
			Emetic	Lacey, 1993
			Soporific, purgative: cones, berries, flowers; emetic, physic: bark	Chandler et al.,1979
			Used as cathartic, emetic	Lacey, 1993
Sambucus racemosa	Scarlet Elderberry; *Pukulu'skwimanaqsi'l	Grows in riparian environments, woodlands, and other habitat, generally in moist areas	Herbs used as an "emetic (with round wood)"	Chandler et al.,1979
Sanguinaria canadensis	Bloodroot	In or at the edge of rich, moist woods, in the shade	Infusion of roots used for colds	Rousseau, 1948
			Roots used for hemorrhages and to prevent bleeding	Chandler et al.,1979
			Roots used for infected cuts	Chandler et al.,1979
			Used as an abortifacient	Rousseau, 1948
			Used as an aphrodisiac	Rousseau, 1948
			Used for hemorrhage, rheumatism, tuberculosis	Lacey, 1993
Sanicula marilandica	Maryland Sanicle	Found in rich woods, meadows and shores	Roots used for irregular menstruation	Chandler et al.,1979
			Roots used for kidney trouble	Chandler et al.,1979
			Roots used for menstrual pain	Chandler et al.,1979
			Roots used for menstrual pain and slow parturition	Chandler et al.,1979
			Roots used for rheumatism	Chandler et al.,1979
Sarracenia purpurea	Northern Pitcher Plant	Bogs	Used to treat dyspepsia, nephrosis, tuberculosis	Lacey, 1993
			Herb used for pain	Chandler et al.,1979
			Herbs used for kidney trouble and consumption	Chandler et al.,1979
			Herbs used for spitting blood	Chandler et al.,1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
			Roots steeped, used for sore throat, spitting blood	Speck, 1917
			Strong decoction of root taken for "spitting blood" and pulmonary complaints	Speck, 1917
			Used for spitting blood	Chandler et al.,1979
Scirpus microcarpus	Panicled Bulrush	Found in course, fine, or medium textured saturated soils. Lowland to middle elevations in mountain riparian, marshes and wet meadow zones	Roots used for abscesses	Chandler et al.,1979
Solanum dulcamara	Climbing Nightshade	In open woods, edges of fields, fence lines, roadsides, and occasionally in hedges and gardens	Roots used for nausea	Chandler et al.,1979
Sorbus americana	American Mountain Ash; **aqamoq' wisqoq*	Found along hedgerows and in open wooded areas	Bark used for "mother pains"	Chandler et al.,1979
			Bark used for boils	Chandler et al.,1979
			Infusion of root taken for colic	Speck 1917
			Parts of plant used as an emetic	Chandler et al.,1979
			Used for stomachache, witchcraft	Chandler et al.,1979
Streptopus amplexifolius	Claspleaf Twistedstalk	Found in wet sub-alpine woods and thickets, rich moist coniferous and deciduous woods at elevations	Parts of plant used for kidney trouble	Chandler et al.,1979
			Parts of plant used for spitting blood	Chandler et al.,1979
Symphoricarpus albus	Waxberry	Commonly found in gardens and surrounding buildings	Used for headache and as tonic	Chandler et al.,1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Symplocarpus foetidus	Skunk Cabbage;	Grows in large, dense stands in wet thickets, woods and swamps	Diabetes, toothache, tuberculosis	Chandler et al.,1979
			Herb used for headache	Lacey, 1993
			Herbs used for headache	Lacey, 1993
Tanacetum vulgare	Common Tansy	Found in pastures, hay fields, riparian habitats and wastelands	Herb used for prevention of pregnancy; leaves used for kidney trouble	Chandler et al.,1979
			Herbs used to prevent pregnancy	Chandler et al.,1979
			Leaves used for kidney trouble	Chandler et al.,1979
Taxus canadensis	Canada Yew	Found in forests, thriving in swampy woods, ravines, riverbanks and on lakes shores	Bark used for bowel and internal troubles	Chandler et al.,1979
			Leaf tea used for fever	Lacey, 1977
			Parts of plant used for afterbirth pain and blood clots	Chandler et al.,1979
			Parts of plant used for afterbirth pain and clots	Chandler et al.,1979
			Parts of plant used for fever	Chandler et al.,1979
Thuja occidentalis	Eastern White Cedar; * *qaskusi; qaskusi a:qamikt*	Found in swampy regions (both fresh and salt water) and near old pastures	Inner bark, bark and stems used for burns	Chandler et al.,1979
			Inner bark, bark and stems used for cough	Chandler et al.,1979
			Stems used for headaches	Chandler et al.,1979
			Twigs used for headache; leaves used for swollen feet and hands	Chandler et al.,1979
			Used for swelling	Lacey, 1993
Tiarella cordifolia	Heartleaf Foamflower	Found in rich moist woodlands in the mountains	Roots used for diarrhea.	Chandler et al.,1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Tilia americana	American Basswood	Found in moist soils along stream banks and pond margins. Also in low woods	Bark used for suppurating wounds	Chandler et al.,1979
			Inner bark, bark and stems used for cough	Chandler et al.,1979
			Roots used for worms	Chandler et al.,1979
Tilia sp.	American Basswood	Found in moist soils along stream banks and pond margins. Also in low woods	Used for infections, sores, wounds	Lacey, 1993
Trifolium pratense	Red Clover	Found in open, moist or dry sites like old fields, pastures, roadsides and disturbed areas	Used as tonic	Lacey, 1993
Trifolium sp.	Clover	Found in open, moist or dry sites like old fields, pastures, roadsides and disturbed areas	Used for fever, insect stings	Lacey, 1993
Tsuga canadensis	Eastern Hemlock; **Ksu:skw; kastuk; qast'k*	Mountains (northern slopes) and valleys	Bark and stems used for colds	Chandler et al.,1979
			Bark used as cough medicine and for grippe	Chandler et al.,1979
			Bark used for beverage or medicine	Speck and Dexter, 1951; Wallis and Wallis, 1955; Lacey, 1977
			Bark used for stomach troubles, colds, cough, grippe; inner bark used for scurvy	Chandler et al., 1979
			Bowel and internal troubles, colds cough, grippe, bark	Wallis, 1922
			Inner bark used for chapped skin	Chandler et al.,1979
			Inner bark used for diarrhea	Chandler et al.,1979

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
			Parts of plant used for bowel, stomach and internal troubles	Chandler et al.,1979
			Roots and stems used for "cold in kidney"	Chandler et al.,1979
			Used to treat cold	Lacey, 1993
Typha latifolia	Broadleaf Cattail; *nukwa:luwejkewey; poqomaqan'skw	Found in full sun, wet conditions and soil that is muddy or sandy	Leaves used for sores	Chandler et al.,1979
Ulmus rubra	Slippery Elm; *wikpi	Found in moist, rich to dry, limestone soils	Bark used for suppurating wounds	Chandler et al.,1979
Vaccinium macrocarpon	Large-fruited Cranberry; *Su:n	Bogs and marshes	Tonic to treat urinary and bladder infections	Lacey, 1993
Vaccinium myrtilloides (presumed)	Blueberry; *Pkuman; pkwiman	Common in peat covered barrens, dry soil, headlands and sandy regions	Tonic for rheumatism	Lacey, 1993
Vaccinium spp.	Blueberries, Bilberries, Cranberries; *Pkuman; pkwiman; su:n	Flourish in acidic, sandy soils. Found in wetlands, bogs and meadows	Berry juice used, unknown ailment	Lacey, 1977
Verbascum thapsus	Common Mullein	Found in pastures and in gravel plains as well as along roadsides and in light soils	Used to treat asthma	Lacey, 1993
			Parts of plant used for sores and cuts	Chandler et al.,1979
Viburnum lentago	Nannyberry	Found in moist mixed grassland, aspen parkland and boreal transition	Roots used for irregular menstruation	Chandler et al.,1979
Viburnum prunifolium	Blackhaw	Found in rich mesic woodlands, upland woodlands, thinly wooded bluffs, rocky wooded slopes, limestone glades	Infusion of plant taken before and during parturition	Wallis, 1922

Species	Common Name (*Mi'kmaw name[11])	Habitat	Mi'kmaq Traditional Use	Source
Viburnum trilobum	Highbush Cranberry; * *Nipanmaqsi'l*	Predominantly along streams and in swamps	Used to treat adenopathy, swellings	Lacey, 1993
Viola arvensis	Field Pansy	Along roadsides and in fields	Effective in the treatment of sore eyes	Lacey, 1993
Viola sp.	Violet	Found in moist to mesic black soil prairies, open woodlands, wooded slopes along rivers or lakes	Conjunctivitis	Lacey, 1993

2.4.3 Additional Plant Uses

The Mi'kmaq have a long-standing history of utilizing the land for not only food and medicine, but have also harvested resources for aesthetic purposes and/or tool making. Table 7 provides the plant species that were traditionally used by the Mi'kmaq for variety of purposes including tools, construction, clothing, heat, dyes, etc.

Table 7: Plant Species Traditionally Used by Nova Scotia Mi'kmaq

Scientific Name	Common Name (*Mi'kmaw Name[12])	Habitat	Mi'kmaq Traditional Uses	Source
Abies balsamea	Balsam Fir; * *Stogn*	Various regions including mountains, canyons and valleys	Wood used for kindling and fuel;Boughs used to make beds.	Speck and Dexter, 1951; Unama'ki Institute of Natural Resources, 2012
Acer pensylvanicum	Moosewood; Striped Maple; **Mimkutago'q*	Rocky woods, rich deciduous forests, wooded slopes and along streams	Thin saplings used in wigwam construction	Nova Scotia Museum factsheet, ND
Acer rubrum	Red Maple	Swamps, alluvial soils, and moist uplands	Used to make basketware.	Speck and Dexter, 1951

[12] DeBlois, 1996; Wallis and Wallis, 1995; Unama'ki Institute of Natural Resources, 2012

Scientific Name	Common Name (*Mi'kmaw Name[12])	Habitat	Mi'kmaq Traditional Uses	Source
Acer saccharum	Sugar Maple **Snawey*	Well-drained soils	Used to make bows and arrows.	Speck and Dexter, 1951
Acer sp.	Maple	Various	Pins for securing clothing	Wallis and Wallis, 1964
Alnus sp.	Alder **Tupsi*	Low ground in alluvial soils	Bark used to make a dye.	Speck and Dexter, 1951
Betula papyrifera	White/Paper Birch **Maskwi*	Forests, especially on slopes	Bark used to make baskets; bark used to make boxes, coffins and other containers; bark used to make canoes; bark used to make dishes and cooking utensils; bark used to make house coverings.	Speck and Dexter, 1951; Speck and Dexter, 1951; Rousseau, 1948; Speck and Dexter, 1951; Speck and Dexter, 1951
Betula alleghaniensis	Yellow birch		Branches used as straps and thongs.	Wallis and Wallis, 1960
Betula sp.	Birch	Various depending on species	Bark used to make torches for night fishing. Bark used to make trumpets for calling game. Bark used to construct containers, boxes, and cups Bark sheets used in wigwam construction	Speck and Dexter, 1951; Speck and Dexter, 1951; Wallis and Wallis, 1955; Nova Scotia Museum factsheet, ND.
Corylus cornuta	Hazel root		Basketry	Wallis and Wallis, 1955
Fagus grandifolia	American Beech	Fertile uplands, rarely in swamps	Used to make snowshoe frames.	Speck and Dexter, 1951
Fraxinus americana	White Ash	Intervale forests, low ground, and open woods	Used to make axe and knife handles.	Speck and Dexter, 1951
Fraxinus nigra	Black Ash **Wiskoq*	Low ground, damp woods and swamps	Used to make basketware.	Speck and Dexter, 1951
Galium tinctorium	Stiff Marsh Bedstraw/ Small Bedstraw	Low-lying areas, brooks, marshes, and bogs	Roots used to make a red dye for porcupine quills.	Speck and Dexter, 1951
Hierochloe odorata	Sweetgrass **Kjimskiku*	Moist heavy soils, generally in the upper reaches of tidal marshes	Used to make baskets. Used to make mats.	Speck and Dexter, 1951
Juniperus sp.	Red Cedar	Various, depending on species	Wood used for kindling and fuel.	Speck and Dexter, 1951
Larix laricina	Eastern Larch/ Tamarack	Bogs and wet depressions in forests	Wood used for kindling and fuel.	Speck and Dexter, 1951

Scientific Name	Common Name (*Mi'kmaw Name[12])	Habitat	Mi'kmaq Traditional Uses	Source
	*Apu'tam'kie'jit			
Picea glauca	White Spruce; Cat Spruce; *Kawatkw	Old fields and along the coast	Boughs used to make beds. Wood used for kindling and fuel.	Speck and Dexter, 1951Speck and Dexter (1951)
Picea mariana	Black Spruce; Bog Spruce; *Kawatkw	Bogs, swamps and poorly drained areas	Boughs used to make beds. Roots used as sewing material for canoe birch bark products. Wood used for kindling and fuel.	Speck and Dexter, 1951
Pinus strobus	Eastern White Pine	Bogs, swamps and poorly drained areas	Wood used for kindling and fuel.	Speck and Dexter, 1951
Picea spp.	Spruce	See White and/or Black Spruce	Poles for wigwam construction Root used as twine, for sewing	Nova Scotia Museum factsheet, ND Wallis and Wallis, 1955
Salix sp.	Willow	Various, depending on species	Leaves used as tobacco.	Speck and Dexter, 1951
Taxus canadensis	Canada Yew	Cool damp woods, ravines, climax coniferous, and wooded swamps.	Leaves used to make a green dye.	Speck, 1917
Thuja occidentalis	Eastern White Cedar	Lakesides and swamps or old pastures	Used to make arrow shafts; used to make canoe slats; wood used for kindling and fuel; woven into bags and mats; inner bark used as twine, for sewing	Speck and Dexter, 1951Nova Scotia Museum factsheet, ND Wallis and Wallis, 1955
Tilia spp[13].	Basswood	Not native to NS	Bark woven into bags and mats	Nova Scotia Museum factsheet, ND
Tsuga canadensis	Eastern Hemlock	Northern slopes or ravines	Bark used to make a dye. Wood used for kindling and fuel.	Speck and Dexter, 1951
Typha spp.	Cattails	Marshes, wet depressions	Woven into bags and mats	Nova Scotia Museum factsheet, ND

[13] There may be confusion over this common name, as basswood (*Tilia* species, or Linden) is not native to NS or NB.

2.5 Traditional Mi'kmaq Place Names

An investigation of the traditional place names of *Mi'kma'ki* (Figure 1) reveals much about the unique relationship held between the Mi'kmaq and the land and resources on which they depend. The names are versatile and dynamic; they describe where to find resources, features of the landscape or where events took place. The names were descriptive of place but also represent the imagination and interpretation of a people moving through a dynamic and changing landscape. Evidence of this can be found in the language, history and myths of the Mi'kmaq people.

Language is one way cultures structure, give meaning to, and interact with the world around them. This is especially true for indigenous peoples with longstanding connections to a place. "Language is the principal instrument by which culture is transmitted from one generation to another, by which members of a culture communicate meaning and make sense of their shared experience. Because language defines the world and experience in cultural terms, it literally shapes our way of perceiving — our world view" (Canada, 1996). The Mi'kmaq language emerged from the sustained presence of the people in their territory for over 10 000 years. This ancient relationship has resulted in a distinct worldview which is inherently place based due to the cumulative experience of the people interacting with the landscape. The place names that were developed through this process give insight into the changing nature of the landscape, but also the cultural nuances of the people.

Before the arrival of European settlers the Mi'kmaq were a nomadic people, migrating seasonally throughout *Mi'kma'ki*. This freedom from a single dwelling place played a role in the way the Mi'kmaq conceptualized both the physical geography of their territory, and understood their place within it. While the Mi'kmaq frequented certain locations, their interaction with the landscape and conceptualization of space was based on movement through an area, rather than the identification of a single point or location. Unlike European languages, the Mi'kmaw language is verb oriented. Many place names are verbs rather than nouns, describing a sense of 'being from' or 'going to' a given place (Sable and Francis, 2012). The Mi'kmaq relationship to place was more important than any one location; the people interacted with the land through a dynamic interpretation of the landscape as they moved through it. While many names may appear to describe a single location, these names represented cultural indicators which the people interpreted in relation to the surrounding area and the collective memory of the people.

Place names also give insight into the character of the Mi'kmaq and their traditional beliefs and way of life. This is evident in the role that oral history played in the interpretation of landscape and underlying lessons on how they ought to interact with it. Although many names appear to describe a physical characteristic of the landscape, many of these names are tied into cultural practices, concepts or myths (Hornborg, 2008). This is common in many indigenous cultures with oral traditions where place names act as mnemonic devices, providing a framework for cultural identity and memory

(Sable& Francis, 2012). An example of this are the connection between myth and the explanation of place, such as the relationship between the Glooscap myths and many place names along the shores of the Bay of Fundy (Sable and Francis, 2012). These myths and legends held many moral lessons, but also acted as oral maps of the territory.

The Mi'kmaq conceptualization of place is a complex and holistic subject that intertwines the language, culture, myth and territory of the Mi'kmaq people. Unfortunately during the colonial period many aspects of this Mi'kmaq tradition were lost or forgotten. The following tables offer an incomplete account of the place names within a 10km radius of the study area, as well as other prominent places names from within the region. Some of the place names included here occur in multiple instances across the province and are marked with an asterisk. For example, the name Partridge Island most likely refers to Partridge Island in the Bay of Fundy, as described in the Glooscap myths.

Truro Heights place names (Table 8) and corresponding distance markers (Appendix A).

Table 8: Millbrook Place Names

Place Name	Mi'kmaw Name	Meaning	Source
Andrew Brook	*Kēgulugojooitk'*	The water tumbles and dashes in all directions	Rand, 1919
Black Rock*	*Maktāwopskek*	The black rock	Rand, 1919
Brookfield	*Bankwenopskw*	We hunt him amongst rocks	Rand, 1919
Eagles Nest Point	*Kitpoo-aykaddy*	A place of eagles	Frame, 1892
Higgins Brook*	*Kĕskedeĕmesaak; Keskēdē-emēsaak*	A Rocky Ridge	Rand, 1875; Rand, 1919
Onslow/North River	*Pogopskegek*	N/A	Rand, 1919
Salmon River*	*Pălamooā Seboo*	Salmon River	Frame, 1892
Shubenacadie	*Agekade;*	N/A	Rand, 1919
	Wolnipkookoogwak (River mouth)	Swan hunt	Rand, 1919
	Sāsooguloomin (The place above Shubenacadie River)	Abounding in quartz crystals	Rand, 1919
Cobequid Bay	*Wāgōbāgitk'*	The bay runs far up	Rand, 1919
	Wāgōbāgitk	The end of the flowing current	Rand, 1919
	Wāgobagitk	The end of the water's flow	Rand, 1919
	Wagobagitk	End of rushing water	Rand, 1919
	Maycobegilk	'end of the flowing' meaning the bound of the rushing water, the tide or bore); Cobequid, Truro, now Salmon River.	Frame, 1892

*Multiple instances retrieved from database

3 METHODOLOGY

The project methodology was developed in accordance with the MEKs Protocol adopted by the Assembly of Nova Scotia Chiefs, through the Kwilmu'kw Maw-klusuagn (KMK). The KMK MEKs Protocol provides a number of key guidelines and standards on suggested practices and procedures relevant to the planning, design, development, implementation and reporting of a MEKs.

The methodology for the MEK Study for the proposed wind farms consisted of three main elements. The NEXUS Team conducted a desktop review to gather all relevant information pertaining to the project study areas, historical Mi'kmaq knowledge and Mi'kmaq resource use. Workshops with local Mi'kmaq knowledge holders enabled the collection of local site-specific knowledge of historical and current Mi'kmaq use of natural resources in the area[14]. Field surveys updated the available knowledge of the study areas.

3.1 Literature Review

Archival documents and published works were reviewed for information regarding the past and present Mi'kmaq occupation and use of the Study Areas. The NEXUS Team utilized a range of data sources including historical documents, journal articles, published books, Nova Scotia Public Archives and Records, microfiche scans and local archives. A thorough literature review on existing knowledge and mapped data facilitates the preparation of a concise and accurate MEKs report.

3.2 Mi'kmaq Ecological Knowledge Workshop Preparation and Protocol

NEXUS has adopted the workshop format for conducting MEKs. The process for collecting TEK has moved away from the individual informant interview process to one that brings small groups of community members together in a workshop format. This process enables researchers an opportunity to observe and collect information from a variety of sources (such as youth, elders, women, hunters, community leaders, etc.) during focus group sessions.

The workshop format provides the opportunity to assess the validity of information collected. A participant who is knowledgeable about historical activity or environmental matters is just as concerned about the accuracy of information as any researcher. However, there remains the temptation to embellish certain facts to ensure the final decisions favor the participant's community or agenda (Johannes, 1993). In addition, there is also the risk of having non- MEK experts participating in the study as a means of receiving outside recognition (these individual's have been referred to in Mi'kmaq communities as 'glory seekers'). These individuals do not intend to compromise the reliability of the information gathered in MEKs, however, it does identify the need to integrate a process whereby the information collected is verified.

[14] Workshops are schedule for mid-April.

This workshop format provides a number of benefits to ascertain the validity of information collected. First, the group dynamic created in a workshop format provides the opportunity to dampen embellishment of stories and information. Second, groups can provide multiple perspectives on past community experience and stories passed down from generation to generation within the community. Third, group sessions allow the opportunity for conversations amongst community members, which may trigger old memories. Fourth, groups can provide greater understanding on the 'systems' used in the community to pass information between community members and between generations. Finally, workshops are a more cost and time effective means to conduct MEK surveys. These benefits are not present in 'one on one' interviews between a researcher and participant.

The workshop format requires engagement of Mi'kmaq knowledge holders at the community level. NEXUS worked with individuals from local Mi'kmaq communities in acquiring information on current use and interest of the Study Areas as well as preparing the workshops.

3.3 Surveys of the Study Areas

In addition to the evidence of Mi'kmaq knowledge of the Study Areas, information on the general area encompassing the site was achieved through the workshop maps, field surveys and habitat modeling exercise.

3.3.1 Mi'kmaq Knowledge Workshop Maps

NEXUS collected Mi'kmaq Ecological Knowledge from workshop participants in relation to the three Study Areas. NEXUS digitized the aggregated data on the maps produced in the workshops. The final MEKs maps were entered into a Geographic Information System (GIS) using ArcGIS to create user-generated maps. Copies of these maps are included in this report.

3.3.2 Field Survey for General Habitats and Plant Species

[This section will be revised upon completion of field survey in June]

Field surveys of the Study Areas will be completed to identify and locate plants and other related resources that may be of importance. Field surveys identified plants used by the Mi'kmaq located within the Study Areas.

A vegetation survey will be conducted. The vegetation survey was used to verify the presence of plant species identified during the desktop review stage in the Study Areas. The survey will consist of optically controlled meanders through habitat polygons identified to potentially contain plants of significance to Mi'kmaq. General locations of significant plants will be identified in the field using GPS and photographs recorded with a digital camera.

3.3.3 Wildlife Habitat Modeling Exercise

[This section will be revised upon completion of field survey in June]

Wildlife species potentially located in the Study Area were determined through an analysis of available information. The analysis included information obtained on the historical and contemporary use of wildlife and fish resources by Mi'kmaq (from the literature review and workshop) combined with known wildlife habitat preferences and the results of the habitat surveys.

Information obtained from the literature review, field surveys and workshop were compiled and a habitat modeling exercise conducted. The likelihood of each species' presence on the Study Areas was determined by comparing habitat preferences of NS wildlife species with the habitats known to occur on the Study Areas.

3.4 Analysis of Primary Data

This report includes an analysis of data achieved through workshop, surveys and the collation of supplementary data. The analysis provides a comprehensive and accurate account of the Mi'kmaq Ecological Knowledge, as well as the Mi'kmaq practices, interests and uses within the Study Areas.

[This section will be revised upon completion of field survey in June]

4 RESULTS

4.1 Mi`kmaq Ecological Knowledge Workshops

A workshop was held with members of Millbrook First Nation in order to discuss current land and resource uses within the four Study Areas. The workshop occurred on Thursday April 11, 2013 at the Glooscap Heritage Centre. Hunters, fishers and harvesters attended the meeting. These participants provided information on the Study Areas (Truro Heights, Millbrook and Whynott's Settlement) and provided considerable insight into the current state of use and knowledge associated to the areas near the Millbrook reserve. While some participants were familiar with the Whynott's Settlement and Pockwock Study Areas, the vast majority of input focused on the Truro Heights and Millbrook Study Areas.

Insightful conversations with the Glooscap First Nation provided information that due to the long distance to the four Study Areas that the majority of hunters, fishers and harvesters in the community were not currently frequenting the Study Areas on a regular basis. Although members of Glooscap First Nation have traditionally travelled to these areas and hold interest in the areas, no community members attended the workshop.

Conversations with individuals from the Acadia First Nation led to the understanding that there has been little recent harvesting activity in the area near the Study Areas, thus participation in a workshop would be unnecessary. Active hunters from the Acadia Band travel to Sheet Harbour, NS and Musquodobit NS to hunt. It is important acknowledge the long-standing relationship the Mi'kmaq have with *Mi'kma'ki* and locally, the Study Areas. This intimate relationship is not defined solely by the current use and occupation of a geographical area but by the extensive awareness and interests the Mi'kmaq hold of regions resources. Therefore, the current absence of Mi`kmaq from an area should not be mistaken for an absence of interest (current and future) of the area and resources located within the Study Areas.

The general attitude towards the potential wind farm developments was positive; many participants supported development of non-carbon based or 'green' energy sources. Some concern was expressed over the benefits from the project to the local community. Another issue raised was the potential impacts of the turbines on local wildlife migratory patterns, particularly winged species such as birds, bats and insects. Potential impacts on the Millbrook community (ex. noise) were perceived to be minimal due to the distance from the nearest houses to the proposed turbine location and the density of the forested area between these locations.

4.1.1 Truro Heights Study Area

During the workshop, participants provided considerable information about current Mi'kmaq uses and knowledge of the areas in and around the project Study Areas: Millbrook and Truro Heights. Observations on land and resources use by the meeting participants are illustrated in Figure 3 and Figure 4. The primary activities cited by meeting participants were hunting, fishing, gathering, ATV trekking and hiking.

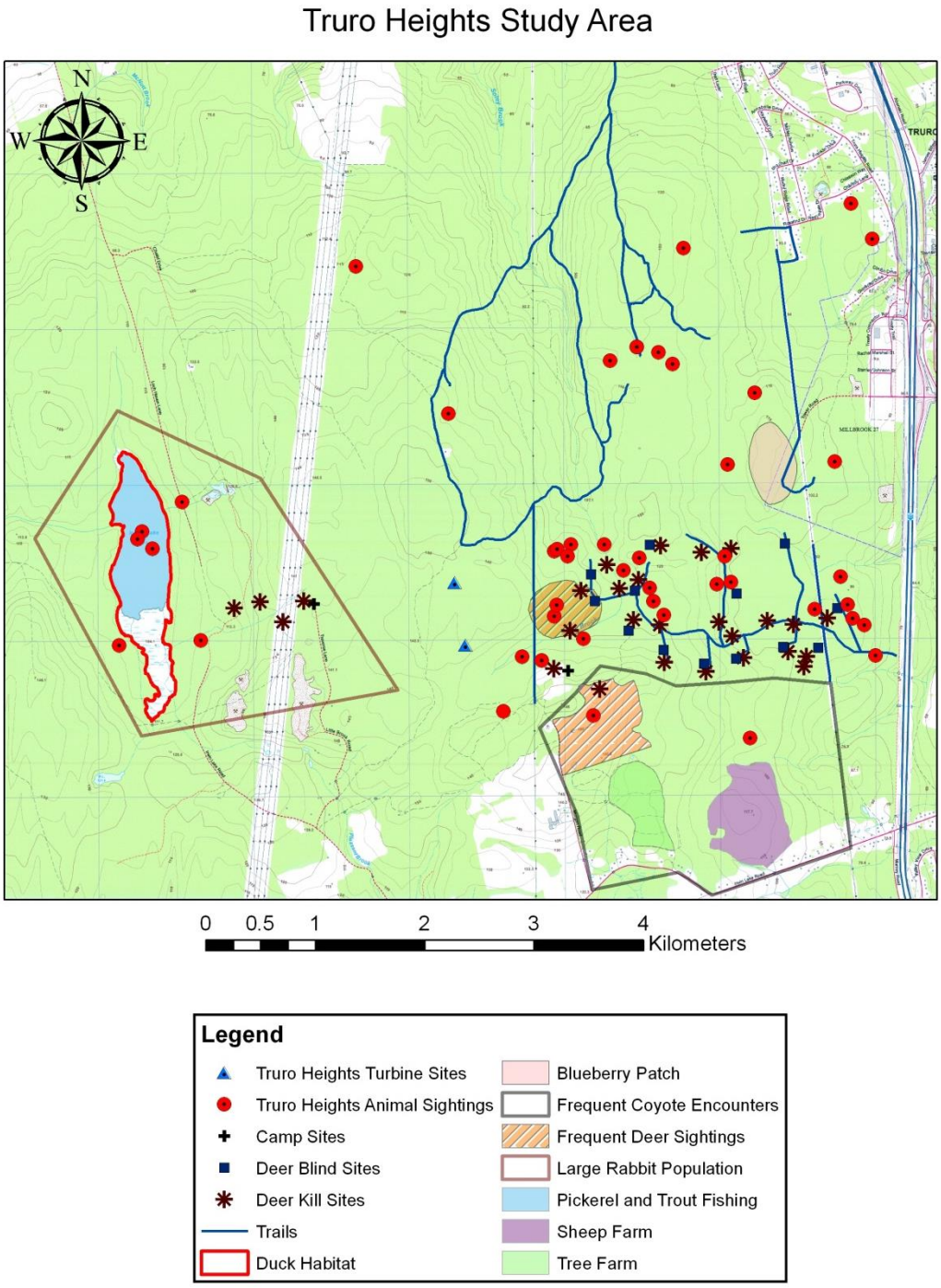

Figure 3: Truro Heights Study Areas Use

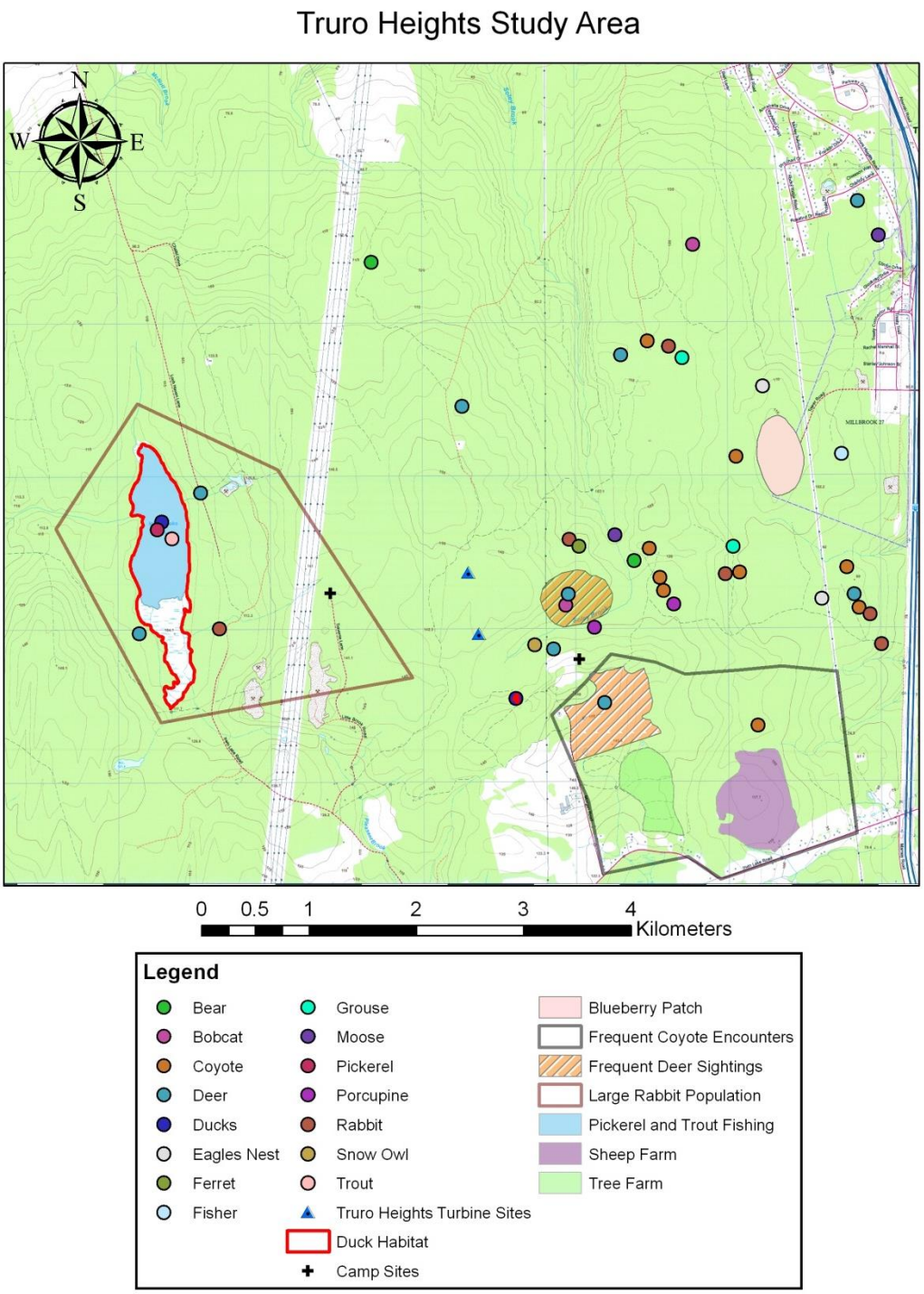

Figure 4: Truro Heights Study Areas Animal Sightings and Areas of Interest

Deer hunting was the most common resource activity cited by workshop participants. This is both a common activity and important source of food for community members. Various deer sightings and kill sites were identified Figure 5. The area directly adjacent to the reserve and to the east of the Study Area was the most commonly utilized zone

for deer hunting within the broader study area. Participants explained that access to this area was easiest due to the close proximity of the community and the density of roads, trails and footpaths. The population of deer was described as quite high, and although deer hunting is undertaken across the region, participants explained that they did not have to travel far to find deer, often preferring to stay in the easily accessible area adjacent to the reserve. Deer were often sighted in areas with clearings, such as along back roads, near the power lines and clear-cut grassy areas.

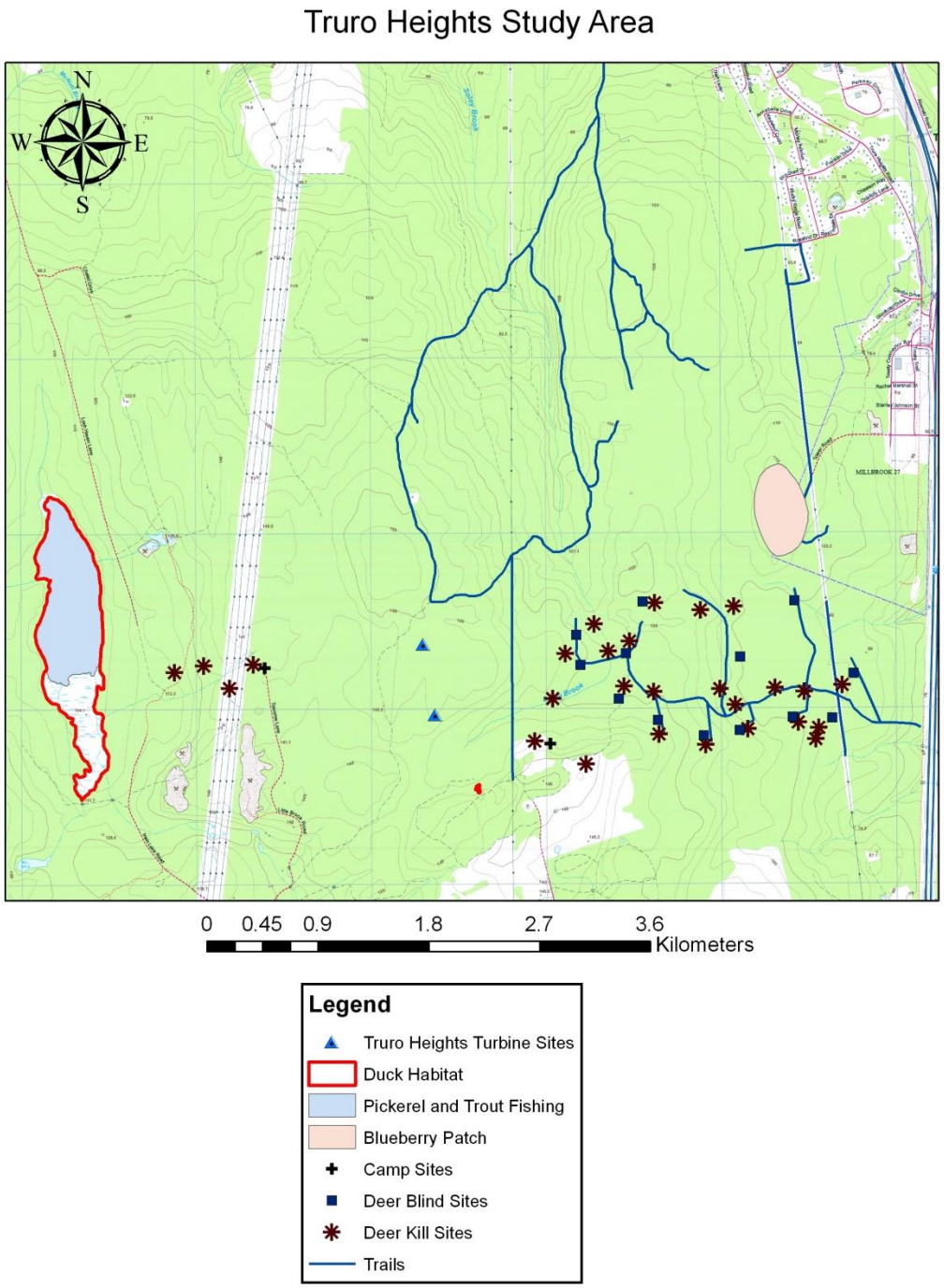

Figure 5: Truro Heights Study Area Resource Harvest

Workshop participants also described hunting for rabbits, bear, grouse and ducks. These animals, along with deer, are mobile and their distribution in the area was considered to be relatively even. Ducks and geese migrate through the area, but due to the relatively few water bodies in the region they were not as common as compared with other regions with higher densities of lakes, rivers and streams.

Many workshop participants also described fishing in streams, brooks, ponds and Irwin's Lake. The most commonly caught species were trout, pickerel and to a lesser extent eel. Concern was raised by several members about the increasing abundance of pickerel in the lake. Pickerel was introduced to the area and was said to be taking over the lake, threatening native and fish used for food. Although fishing is common activity in the area, participants described the need to move further away from the community to more productive fishing grounds to fish for a particular species.

The Study Area was also said to hold many valuable plant species. A popular blueberry patch was noted, and participants described collecting sweet grass, wild cherries and goldenrod near Irwin's lake and along watercourses. The location of medicinal species was not provided due to the high level of cultural and spiritual importance associated to them. The participants explained that there were many medicinal plants in and around the Study. The request to exclude specific locations and species was respected.

Many participants frequented the Study Area for recreational purposes including ATV trekking, hiking, sightseeing and swimming. The participants demonstrated intimate knowledge of the network of roads, trails and footpaths, which created an access network throughout the region. Many species in addition to those hunted were noted inhabiting the area. These include large cats such as bobcats, moose, coyotes, beavers, otters, ferrets, porcupine, fishers, eagles, owls and numerous species of small birds. Coyotes were said to be increasing in numbers in the region and were particularly common in the southern region of the study area due to the presence of a sheep farm. Participants also noted that eagles were nesting in the area, identifying locations near the community.

4.2 Results of General Habitats and Plant Species Survey

A site assessment was completed to identify and locate potential medicinal plants and other related resources located in the Study Areas.

[This section will be updated upon completion of field survey in June]

4.3 Wildlife Habitat Modeling Exercise

Wildlife species potentially occurring in the Study Areas were determined from an analysis of the historical use of wildlife and fish resource by Mi'kmaq (Section 2.3), combined with known wildlife habitat preferences and the habitat surveys.

[This section will be updated upon completion of field survey in June]

5 DISCUSSION & CONCLUSION

The MEKS demonstrates that there has been a long-standing relationship and interest with the regions in and around the Study area.

The meeting held with Mi'kmaq participants from the Millbrook First Nation highlights the vested interest the Mi'kmaq have with their traditional territory. Many users described learning about the lands, resources, skills and knowledge from their relatives, friends and family members. Elders and the fathers of hunters were often cited as the source of knowledge about a particular region or hunting technique. The knowledge of the study areas demonstrated by meeting participants suggest that the Mi'kmaq ecological and traditional knowledge associated to these areas is still accessible in the communities and is being utilized by a wide range of community sectors, from youth to elders. While some activities and areas are more commonly cited than others, the level of community interest in the lands and resources remains active and relevant.

In keeping with the principles and statements of the United Nations Declaration of the Rights of Indigenous Peoples, future planning and collaboration between the project proponent and Mi'kmaq should be implemented and maintained through the application of Mi'kmaq Ecological Knowledge.

[This section will be updated upon completion of field survey in June]

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Appendix A: Truro Heights Place Names Radius Table

Centre Point: Irwins Lake 45º 19' 10" N, 63º 21' 58" W

Place Name	Feature Type	Distance (km)
Alder Brook	River	11
Andrew Brook	River	8
Anthonys Nose	Cape	10
Baird Brook	River	5
Beaver Brook	River	5
Beaver Brook	Unincorporated area	5
Beech Hill	Mountain	7
Bible Hill	Village	11
Black Rock	Unincorporated area	9
Brookfield	Unincorporated area	10
Brookside	Unincorporated area	11
Carter Creek	River	6
Central Onslow	Unincorporated area	7
Chiganois River	River	6
Clifton	Unincorporated area	7
Colchester	Geographical area	9
Colchester	Major municipal/district area - major agglomeration	9
Crowe Mills ** ‡	Unincorporated area	9
Crowes Brook	River	8
Crowes Mills	Unincorporated area	9
Debert Game Sanctuary ** ‡	Conservation area	10
Debert Wildlife Management Area	Conservation area	10
Eagles Nest Point	Cape	10
Farnham Brook	River	9
Fisher Creek	River	9
Five Mile River	River	11
Fivemile River ** ‡	River	11
Fort Belcher	Unincorporated area	6
Foundry Hill **	Mountain	9
Galloping Brook	River	9
Green Creek	Unincorporated area	9

Place Name	Feature Type	Distance (km)
Green Oaks	Unincorporated area	9
Greens Creek	Bay	10
Greens Creek ** ‡	River	10
Higgins Brook	River	6
Higgins Pond	Lake	9
Hilden	Unincorporated area	6
Irwin Lake ** ‡	Lake	0
Irwins Lake	Lake	0
Lake Brook	River	10
Lepper Brook	River	9
Lightbody Brook	River	10
Lockherds Point	Cape	9
Lower Onslow	Unincorporated area	7
Lower Pleasant Valley	Unincorporated area	6
Lower Truro	Unincorporated area	6
Lyons Head	Cape	6
MacElmons Pond	Lake	10
MacElmons Pond Provincial Park	Conservation area	9
Masstown	Unincorporated area	12
Maynard Brook	River	7
McClures Brook	River	6
McClures Mills **	Unincorporated area	6
McCurdy **	Unincorporated area	8
McCurdy Brook	River	9
McCurdys Corner	Unincorporated area	9
McLure Brook ** ‡	River	7
McNutt Brook	River	5
Mill Brook	River	4
Mill Brook	River	5
Millbrook	Unincorporated area	5
Millbrook 27	Indian Reserve	5
North River	River	9
Old Barns	Unincorporated area	4
Oliver Brook	River	10
Onslow	Unincorporated area	9

Place Name	Feature Type	Distance (km)
Pitch Brook	River	8
Plaster Brook	River	7
Pleasant Brook	River	7
Pleasant Valley	Unincorporated area	9
Princeport	Unincorporated area	9
Princeport Road	Unincorporated area	6
Salmon River	River	5
Salmon River	Unincorporated area	11
Shubenacadie River	River	9
Sibleys Pond	Lake	11
Smith Island	Island	6
Soley Brook	River	6
South Brook	River	9
South Maitland	Unincorporated area	11
Staples Brook	River	10
Trenholms Lake	Lake	10
Truro	Town	8
Truro 27A	Indian Reserve	6
Truro 27B	Indian Reserve	6
Truro 27C	Indian Reserve	6
Truro Heights	Unincorporated area	5
Upper Brookfield	Unincorporated area	11
Upper Onslow	Unincorporated area	10
Upper Pleasant Valley **	Unincorporated area	8
Wilson Brook	River	10
Withrows Lake	Lake	12
Yuill Island **	Island	5

Legend	
**	Indicates a former name
‡	Indicates that the official name is available
†	Indicates that this name is available in another language
◊	Indicates a Pan-Canadian feature

APPENDIX J
SHADOW FLICKER MODELING RESULTS

Receptor ID	Easting (n)	Northing (n)	Predicted Shadow Hours/Year	Predicted Max Shadow Hours on Worst Day
R1	473775	5016000	0:00	0:00
R2	471604	5019761	9:33	0:19
R3	472499	5017583	0:00	0:00
R4	474225	5016471	0:00	0:00
R5	472428	5016997	0:00	0:00
R6	472543	5017353	0:00	0:00
R7	474045	5017415	0:00	0:00
R8	474352	5016574	0:00	0:00
R9	471614	5019760	9:49	0:19
R10	474363	5016638	0:00	0:00
R11	474359	5016620	0:00	0:00
R12	472929	5016882	0:00	0:00
R13	474314	5016568	0:00	0:00
R14	473838	5016099	0:00	0:00
R15	473830	5020409	0:00	0:00
R16	474685	5016573	0:00	0:00
R17	472551	5017331	0:00	0:00
R18	472411	5016993	0:00	0:00
R19	474180	5016427	0:00	0:00
R20	474727	5016551	0:00	0:00
R21	473762	5016018	0:00	0:00
R22	474618	5016575	0:00	0:00
R23	474134	5016628	0:00	0:00
R24	472471	5016611	0:00	0:00
R25	473960	5016937	0:00	0:00
R26	472207	5016928	0:00	0:00
R27	472411	5017283	0:00	0:00
R28	474398	5016593	0:00	0:00
R29	473955	5016912	0:00	0:00
R30	472970	5016893	0:00	0:00
R31	474748	5016539	0:00	0:00
R32	474448	5016606	0:00	0:00
R33	473888	5017451	0:00	0:00
R34	473865	5016138	0:00	0:00
R35	474015	5016870	0:00	0:00
R37	472480	5016886	0:00	0:00
R38	472391	5017299	0:00	0:00
R40	473443	5015971	0:00	0:00
R41	474170	5016589	0:00	0:00
R42	474100	5016704	0:00	0:00
R43	473683	5015969	0:00	0:00
R44	471881	5017668	0:00	0:00
R45	474251	5016491	0:00	0:00
R46	474298	5016537	0:00	0:00
R47	472365	5016888	0:00	0:00
R48	474175	5016448	0:00	0:00
R49	473631	5015959	0:00	0:00
R50	473475	5015980	0:00	0:00
R51	473696	5015989	0:00	0:00
R52	473993	5016908	0:00	0:00
R53	474681	5016617	0:00	0:00
R54	474120	5016709	0:00	0:00
R55	474357	5016656	0:00	0:00
R56	473404	5015962	0:00	0:00
R57	474156	5016646	0:00	0:00
R58	472485	5017083	0:00	0:00
R59	472571	5017438	0:00	0:00
R60	472575	5017447	0:00	0:00
R61	472692	5017609	0:00	0:00
R62	471777	5017978	4:07	0:17
R63	471776	5017966	9:32	0:17

Receptor ID	Easting (n)	Northing (n)	Predicted Shadow Hours/Year	Predicted Max Shadow Hours on Worst Day
R64	471767	5017960	9:24	0:17
R65	471748	5017979	9:01	0:17
R66	471736	5017969	8:52	0:17
R67	471966	5018988	0:00	0:00
R68	471476	5018827	0:00	0:00
R69	471485	5018758	0:00	0:00
R70	471511	5018546	0:00	0:00
R71	474646	5017031	0:00	0:00
R72	474607	5017073	0:00	0:00

*R36 removed from model after field truthing confirmed that there was no structure at this location

*R39 removed from model as it is considered a participating receptor