# FISHER ENGINEERING LTD.



40 Fairfield Road Lower Coverdale, New Brunswick E1J 0A2 Phone: 506. 863. 1991

December 7<sup>th</sup>, 2018

File: PC008

Mr. David Maguire Director Project Assessment Branch Department of Environment 20 McGloin Street PO Box 6000 Fredericton, NB E3B 5H1

Attention: Mr. Maguire:

### RE: Domain Nature Estates Subdivision Expansion, Greater Lakeburn, NB

Enclosed are two hard copies and an electronic copy on USB of the registration document for the above noted undertaking. A cheque for the registration fee is also enclosed.

If you have any questions or require further details, please do not hesitate to contact the undersigned.

1 thinken

Michael Fisher, P. Eng.

MJF

Enclosures

cc: Mr. Rino Savoie, 690763 NB Inc.

## EIA Registration Domain Nature Estates Subdivision Expansion

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## EIA Registration Domain Nature Estates Subdivision Expansion

Pursuant to Section 5(2) of The Environmental Impact Assessment Regulation 87-83 Clean Environment Act

### 1 The Proponent

Name: 690763 NB Ltd.

Address: 171 Lutz Street Moncton, NB E1C 5E8

Chief Executive Officer: Rino Savoie, (506) 227-7666

**Principal Contact Person for Purposes of EIA:** Rino Savoie, (506) 227-7666 and Michael Fisher, Fisher Engineering Ltd. (506) 863-1991.

Property Ownership: Same as Proponent

#### 2 The Undertaking

Name: Domain Nature Estates Subdivision Expansion

**Project Overview:** Domain Nature Estates was started in 2008 and consisted of an approved 88 lots (EIA 4561-3-1289). The developer now wants to expand the popular subdivision following the purchase of adjacent land. The last approved phase within Domain Nature Estates was Phase VI and consisted of fourteen lots. The proposed expansion once completed will consist of an additional 80 residential building lots. The development will be extended from the existing two main roads, Nature Drive and Lafontaine Drive with several branch roads connecting the two. The lots sizes within the subdivision range from 4200m<sup>2</sup> to 20,000m<sup>2</sup>.

**Purpose/Rationale/Need:** The purpose of the project is to continue with the development of the subdivision that was started in the 2008. With the growth of the City of Dieppe, the subdivision provides people an opportunity to live in a rural setting with larger lots yet be only minutes away from the City.

**Project Location:** The subdivision is located approximately 1 km east of Dieppe's City limits and is on the east side of the Leblanc Road in Greater Lakeburn, NB (Figure 1, Figure 2 – Appendix A). The proposed expansion covers four parcels as identified by Service New Brunswick, PID 70473947, 70630280, 70495908, and 70007117. The proposed expansion covers an approximate area of 53.8 hectares.

**Siting Considerations:** The project location was chosen because of the proximity to the City of Dieppe and the success of the existing subdivision. The land is currently zoned, Agricultural – Zone A, which permits single unit residential dwellings. The site is easily accessible off the two existing main streets within the existing subdivision (Nature Drive and Lafontaine Drive. There are currently three exits from the Subdivision, two onto LeBlanc Road, which have been established since the subdivision started, and a third which was added when an adjacent land owner extended Mariette Avenue out to Melanson Road. The existing infrastructure will be able to handle the increased traffic that will be generated by the proposed new residential lots.

The proposed development will adhere to the required conditions and setbacks as outlined in the following regulations in the New Brunswick Community Planning Act:

- Greater Moncton Planning Area Rural Plan Regulation
- Regulation 88-3, Greater Moncton Planning District Order.
- Regulation 84-292, Provincial Setback Regulation
- Regulation 80-159, Provincial Subdivision Regulation

The project site is not located within Zone A or Zone B of a protected coastal area. There is one mapped wetland on the property that was identified through GeoNB mapping.

**Physical Components and Dimensions of the Project:** A conceptual plan showing the proposed expansion of the development and associated physical components and infrastructure is presented in Figure 2. All of the roads will be constructed to New Brunswick Department of Transportation and Infrastructure (NBDTI) standards. There are approximately 3.5km of roads within the proposed expansion of the development to be constructed. All of the roads within the subdivision will be chip sealed as per NBDTI standards. There will be no sidewalks installed and all electrical will be on overhead power poles. Water and sanitary will be provided by individual wells and septic systems respectively. Drainage ditches will be installed for storm water runoff.

The lots will be sold as forested, which is consistent with the existing subdivision. Property owners who have developed in existing subdivision are tending to leave as many of the trees as possible to maintain their privacy. By maintaining the natural landscape the development is more attractive to homeowners who are looking to locate outside the city. The estimated total area of impervious surfaces including the roads and rooftops for an average 150m<sup>2</sup> home on every lot is ten percent of the total site.

Outside of the mapped wetland, there are no mapped watercourses within the development area. The majority of the drainage across the site is directed toward the wetland. More details on the existing wetland and vegetation are presented in the attached wetland delineation and rare plant reports.



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#### **Construction Details:**

Typically, construction work will consist of three main tasks: Task 1: clearing and grubbing of the right-of-way for the roads, 4-5 weeks during the winter months (January-March)

Task 2: subgrade work, 3-4 weeks during the spring (May-June).

Task 3: installation of granular sub base material, 1-2 weeks during the summer months (July-August). Construction within the existing subdivision was completed typically every other year as five phases of that development were completed between 2008 and 2017.

The potential sources of pollutants generated during the construction phases are discussed in Section 4.

Typical hours of construction are Monday to Friday 7:30am to 5:00pm. The anticipated equipment that will be used includes an excavator, bulldozer, and several dump trucks. Fill material required for the road construction will include sandstone rock and granular material. The proponent intends to purchase any required fill material from a local quarry.

**Operation and Maintenance Details:** Since the subdivision will be serviced with individual private wells the New Brunswick Department of Environment (NBDELG) require that a groundwater exploration program be completed, which will show that the surrounding aquifer can support the proposed expansion of the 80 lot development. The exploration program will follow the NBDELG Water Supply Assessment Guideline. The exploration program will consist of drilling test wells at strategic locations across the property and performing a minimum of one 72 hr pump test. The pumping test data will be analyzed to determine the long-term sustainability of the aquifer. Pumping test(s) will be conducted as outlined in the guideline and will be performed during February/March of 2019 when groundwater recharge is minimal. The estimated water requirement for the proposed 80 lots is 108 m<sup>3</sup>/day (16.5 igpm), which is based on a per person water usage of 450 Litres per day and an average of 3 people per household. A WSSA application to complete the hydrogeological assessment for this development is attached is Appendix C.

With the roads being constructed to NBDTI standards they will be considered public and operation and maintenance including plowing will become the responsibility of the NBDOT. Design of the subdivision roads must follow the NBDTI minimum standards for the Construction of Subdivision Roads and Streets. Each phase of the development will require engineered plans along with a drainage report be approved by the department prior to construction. This process ensures that all roads/culverts/drainage is designed appropriately and that any impacts are mitigated as work also must follow the New Brunswick Department of Transportation Environmental Management Manual.

**Project Related Documents:** Overdale Environmental Inc. was retained to complete a rare vascular plant survey, wetland delineation and functional assessment report. These documents are attached. In addition, the previous EIA determination approval for Phase VI of Nature Estates is attached along with the approved Tentative approval. The previous EIA submission 4561-3-1289 had two comprehensive water supply studies completed that were prepared by Fisher Engineering Ltd. relating to the project. The conclusions of the report along with the references are presented below.

- Comprehensive Water Supply Study Assessment Domain Nature Estates Subdivision Hydrogeological Study EIA File# 4561-3-1289 November 2011. File # PC005. The water study was completed for 88 lot proposed subdivision.
  - "In our professional opinion, the drilling and hydraulic testing activities indicate that groundwater withdrawals from the proposed subdivision will not exceed the long-term safe yield of the aquifers and will not aggravate existing, or create new water supply problems for existing users in the area. The majority of the residents of the subdivision are likely to obtain safe well yields greater than 5 igpm from their wells, which easily meets the individual household / lot requirements of 1.53 m<sup>3</sup>/day or 0.234 igpm on a continuous basis."

### 3 Description of the Existing Environment

### Physical and Natural Features:

- Based on 1:10,000 scale mapping the surface elevation across the site ranges from approximately 47 metres to 60 metres above mean sea level.
- The subject property is located within the drainage area of Fox Creek and within 4 kilometres of the Petiticodiac River. Surface water drainage across the majority of the site is expected to be controlled by a tributary to Fox Creek that bisects the property flowing south to north. The area to the west of the stream would flow to the east and the area to the east of the stream would be expected to flow westward under natural conditions. Approximately half of the first phase of the development drains westward toward Leblanc Road where is it picked up by the road side ditches.
- Shallow groundwater flow across the property is expected to follow the local topography, which slopes toward a tributary to Fox Creek. Deeper groundwater likely flows in a westerly direction toward the Petiticodiac River. The area to the south and east that could potentially contribute groundwater to the study area is primarily forested.
- The regional bedrock geology is mapped as late Carboniferous stratified rock belonging to either the Cumberland or Pictou Groups, which are both a subbasin of the Maritimes Carboniferous Basin. Mapping indicates that within the Cumberland Group the site may fall within the Boss Point Formation, which consists mainly of fine-grained to granular sandstone, siltstone, and mudstone (Rivard et al. 2003). Within the Pictou Group, the site may fall within the Salisbury Formation, which consists mainly of mudstone (Rivard et al. 2003).
- The Boss Point Formation has been described as one of the more productive sandstone formations in the province (Carr, 1959) while the Salisbury Formation varies from a good to poor aquifer throughout the Moncton basin. The majority of the domestic wells drilled in this formation generally yield 10 igpm (Carr, 1959).
- Surficial geological mapping indicates that the area is underlain by late Wisconsinan age morainal sediments consisting of hummocky, ribbed and rolling ablation till some lodgement till, minor silt, sand, gravel, and boulders generally thicker than 1.5m (Rampton, 1984).
- There are no municipal wells, municipal wellfields, or protected watersheds within 500 metres of the subject site. Surrounding properties rely on private

wells to supply potable water. Within 500 metres of the subject site there are approximately 25 residents.

- One potential wetland was identified on the GEONB mapping and the limits are shown on the site plan. A copy of the GeoNB mapping is attached (Figure 3). The wetland delineation performed by Overdale Environmental identified a larger footprint of the wetland than what is mapped on GEONB; however it is our understanding that the current policy within the NB Department of Environment on wetlands is that what is shown on GEONB is what is regulated and the size of a wetland on a owners land can not increase compared to what is currently mapped on GEONB following a delineation. As such the current mapped wetland on GEONB will be used as the limits of the wetland across the development area.
- A summary of the findings of a requested search of the Atlantic Canada Conservation Data Centre (ACCDC) databases is presented below:

Within the subject site boundaries:

- There were no rare and endangered taxa records,
- No Environmentally significant Areas, and;
- No managed areas.

The findings within a 5km radius include the following:

- Six records of 4 vascular and no record of any nonvascular flora.
- Fifty-none records of 22 vertebrate and 0 records of invertebrate fauna.
- One Environmentally Significant Area Melanson Settlement Lake. North of Melanson Road. There is currently a smaller residential subdivision (like this project) currently under construction adjacent this ESA off Melanson Road

The NBDELG species at Risk database identified no records on the subject site. In addition, there were no reported deer yards on Crown Land within 5 km of the site.

The following are some of the references and personnel that were contacted and used in order to gather information regarding the physical and natural features of the subject and surrounding properties.

- 1. Atlantic Canada Conservation Data Centre ACCDC databases.
- 2. NB Department of Natural Resources Stewart Lusk personal contact for search of NB DNR databases regarding species at Risk, deer yards, etc..
- 3. Environment Canada Species at Risk website http://www.sararegistry.gc.ca
- 4. Canadian Species at Risk. Committee on the Status of Endangered Wildlife in Canada. Web site: <u>http://www.cosewic.gc.ca</u>
- 5. Canadian Wildlife Service website http://www.naturecanada.ca
- Department of Environment Government website designated wellfields - <u>http://www.gnb.ca/0009/0371/0001/0003.html</u>, and protected watersheds -<u>http://www.gnb.ca/0009/0371/0004/0003.html</u>.
- 7. Department of Environment Stewart Lusk personal contact for search of departmental database regarding species at Risk, deer yards, etc.

Cultural Features: None observed or reported on the subject site or adjacent properties

**Existing and Historic Land Uses:** Historical information was obtained through a review of historical aerial photos (1945 through 2011). Residential development along Leblanc Road near Melanson Road has been present since the 1950's. The entire development area has always been vacant and tree covered. Some minor farming activities have occurred along Melanson Road in the past and may continue.

The application is aware of the Agricultural Operation Practices Act that states "A person who carries on an agricultural operation using acceptable farm practices is not liable in nuisance to any person for any odour, noise, dust, vibration, light, smoke or other disturbance resulting from the agricultural operation and shall not be prevented by injunction or other order of a court from carrying on the agricultural operation because it causes or creates odour, noise, vibration, dust, light, smoke or other disturbance that constitutes a nuisance".

### 4 Summary of Environmental Impacts

Potential Environmental Impacts associated with the construction activities are listed below:

- 1. Site drainage from construction activities could affect water quality in the wetland.
- 2. Air Quality issues caused by increased particulate matter (dust) from construction activities, and emissions from heavy equipment. In addition, the use of heavy equipment may increase the ambient noise and vibration in the immediate area.
- 3. Accidental release of hazardous materials such as fuels, lubricants, cement, concrete additives and agents, solvents and paints.
- 4. Wildlife fragmentation will occur as a result of the decrease in the amount of green spaces.
- 5. Road construction through the wetland will destroy wetland habitat within a section of the Road right of way.

### 5 Summary of Proposed Mitigation

The potential environmental impacts listed in Section 4 are discussed further below along with any proposed mitigation.

 Site drainage affecting water quality: The majority of the work will be completed outside a 30 metre natural buffer around the existing mapped wetland with the exception of constructing the two roads.

In order to minimize the potential impacts during construction, a detailed sedimentation and erosion control plan will be developed for the entire project. The plan will include engineered erosion control structures for ditches that convey surface water potentially laden with sediment. Structures will be routinely monitored and accumulated sediment will be removed when required. The New Brunswick Department of Transportation Environmental Management Manual will be used as a guide during the construction phase. 2. Air Quality: Construction activities will occur typically between 7am and 5 pm Monday to Friday. Equipment used will consist of an excavator, dozer, and a few dump trucks. The increased noise and vibration caused by this development is expected to be minimal and similar to the existing conditions.

Particulate generation primarily occurs during the excavation and backfilling operations. Site and weather conditions contribute to the effect particulate matter has on the surrounding environment, i.e. wind and rain directions. Dust will be minimized with the use of water sprays if required.

- Accidental release of hazardous materials: In order to minimize the risk of a release of hazardous materials the following best management practices will be employed during any onsite work.
  - Refuelling of equipment will take place in designated areas where an impermeable surface will be prepared so that a release of fuel or oil does not enter the surface water. The refuelling areas will be located on level terrain and a minimum of 30 metres from any surface water.
  - Except for fuel tanks, petroleum products will not be stored onsite.
  - Any required maintenance work would be performed offsite.

The latest CSA standard for emergency response planning will be reviewed prior to construction. The following standard emergency spill response measures will be followed.

- During construction absorbent material will be kept on-site at all times for immediate response in the event of a spill.
- In the event of a spill, all work will be stopped and a supervisor notified immediately.
- A record of the incident will be taken which will include the personnel and machinery involved, spill containment measures employed, quantity and type of material spilled, date and time of occurrence, and agencies notified.

All necessary actions will be taken to stop the spread of spilled material. Actions may involve ditching, blocking drainage pathways, and using absorbent materials.

Any spills or leaks, such as those from machinery or fuel storage tanks, will be promptly contained and cleaned up. Actions may involve ditching, blocking drainage pathways, and using absorbent materials. In addition, any spills or leaks will be reported to the 24-hour environmental emergencies reporting system (1-800-565-1633) and to the NBDELG Regional Office in Moncton (506-856-2374).

4. Wildlife fragmentation: Since the development will occur in multiple stages over the next six to ten years, the amount of wildlife fragmentation that will occur yearly is minimal. By completing the project in stages the surrounding wildlife will be able to adapt and adjust to the development over time. Construction activities will only occur along the right-of-way for the roads, which cover approximately 8 hectares of the proposed development (15 percent of the total area). All of the clearing and grubbing activities will occur in the winter months, therefore minimizing any potential impacts on migratory birds. There were no reported migratory bird nesting/breeding sites within the subject site. However, all activities will be planned and conducted in a manner that allows compliance with the *Migratory* Birds Convention Act (MBCA).

5. Wetland Destruction: A wetland Compensation Plan will be developed in consultation with NBDLEG for any permeant loss of wetland area, pending the determination of the final road footprint. Any loss will be compensated at a 2:1 ratio.

In addition to the above noted mitigation measures, the following standard NBDTI EMM Mitigative measures will be followed throughout the life of the project:

5.3 – Clearing 5.4 – Culverts 5.6 – Dust Control 5.7 – Erosion and Sediment Management 5.8.1 – Excavation 5.10 – Fire Prevention and Contingency 5.11 – Grubbing 5.12 – Spill Management 5.13 – Storage & handling of Petroleum Products 5.14 - Storage and Handling of other Dangerous Materials 5.23 – Working Near Environmentally Sensitive Areas.

The proponent will regularly consult Environment Canada's local forecast at http://www.weatberoffice.ec.gc.ca/ so that construction-related activities can be scheduled accordingly.

### 6 Public Involvement

The following stakeholders will be contacted directly via a letter in order to obtain input on the project:

 Elected officials, the local service district, Southeast Regional Planning Commission, First Nations representative and residents within 100metres or abutting the subject property.

The letter will outline the scope of the project and will include a schematic of the development. Contact information for any comments will also be provided. The public will be given thirty days to provide comments. Once the comments have been received, a report will be prepared regarding the public's input. The report will be submitted within sixty days of project registration.

### 7 Approval of the Undertaking

Approvals will be required from the following authorities: New Brunswick Department of Environment, New Brunswick Department of Transportation and Infrastructure, and the Southeast Regional Service Commission.

### 8 Funding

No applications for a grant or loan of capital funds from a government agency have or will be submitted. 690763 NB Ltd will be funding the project.

### 9 Signature

1) Tike.

Michael Fisher, P.Eng

Dec. 7<sup>th</sup>/2108 Date

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**APPENDIX A** 

FIGURES



#### Scale/Échelle: 1:15,000

#### Date: 12/3/2018

ensure the best possible quality. This map is a graphical representation of natural and man made features which appproximates the size, configuration and location of the features. This map is not intended to be used for legal descriptions or to calculate exact dimensions or area. SNB makes no representations or warranties, either expressed or implied, as to the accuracy of the information and the client assumes the entire risk as to the use of any or aucune garantie explicite ou implicite quant à l'exactitude de l'information all information.

#### Printed by/Imprimé par:

While this map may not be free from error or omission, care has been taken to Même si cette carte n'est peut-être pas libre de toute erreur ou omission, toutes les précautions ont été prises pour en assurer la meilleure qualité possible. Cette carte est une représentation graphique d'éléments naturels ou artificiels et donne seulement une approximation de la taille, de la configuration et de l'endroi de ces éléments. Elle n'a pas pour but d'être utilisée pour les descriptions juridiques ou le calcul des dimensions ou de la superficie exacte. SNB n'offre présentée; les clients acceptent pleinement les risques liés à l'utilisation d'une partie ou de l'ensemble de cette information.



Project:

# EIA REGISTRATION NATURE ESTATES EXPANSION

Drawing:

# SITE PLAN SHOWING PROPOSED WELL LOCATIONS

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## **APPENDIX B**

## WETLAND DELINATION

### Standard Wetland Delineation Report: Lakeburn, NB

### PIDs 70007117, 70495908 and 70473947

### **December 6, 2018**

For

Michael Fisher, P.Eng Fisher Engineering Ltd. 40 Fairfield Road Lower Coverdale, NB E1J 0A2

By

Theo Popma MSc. (Wetland Delineator) at Overdale Environmental Inc. 342 Highfield st. Moncton, NB E1C 5R6 <u>tpopma@nb.sympatico.ca</u> <u>www.Overdale.net</u> 506-227-7605

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### Introduction:

A Standard Wetland Delineation was conducted on August 26, 2018 by Theo Popma, a recognized Delineator at Overdale Environmental Inc. The properties (PIDs 70007117, 70495908 and 70473947) are located in Lakeburn, NB near Dieppe (Figure 1, Appendix A). The delineation was conducted in accordance with the NB Wetland Conservation Policy and the Clean Environment Act in support of an Environmental Impact Assessment (EIA) triggered by the proposed residential development.

It is recommended that this report be provided by the client to the New Brunswick Dept. of Environment for review.

## Legislation

These identified wetlands are subject to the *Watercourse and Wetland Alteration Regulation* (REG # 90-80), of the New Brunswick *Clean Water Act.* Any proposed alteration within these areas or within the 30 meter regulated upland buffer requires permitting through the Department of Environment, Watercourse and Wetlands Alteration Program. These areas may also be subject to *Environmental Impact Assessment* (REG 87-83) of the New Brunswick *Clean Environment Act* and other *Acts* and Regulations. It is the responsibility of the proponent to ensure that all regulatory requirements are met prior to development within these areas.

## Site Description (See Photos in Appendix D)

The Study Area (Figure 3) has been impacted within the last several decades by clearing (less than 1 hectare), logging and maintenance and culverting of a few small logging roads, paths and ATV trails.

Only one wetland polygon is shown on the GeoNB Wetlands Map for the three adjacent PIDs (Figures 1 and 2).

## Methodology

Surveys were conducted according to the guidelines established by NBENV based on the US Army Corps of Engineer Wetland Delineation Manual (1987), Field Indicators of Hydric Soils in the United States and Lichvar, 2005. The Flora of NB (Hinds, 2000) was consulted for plant identification along with the National List of Plant Species that occur in Wetlands (1988)

Datapoints were analyzed for soil, hydrology and vegetation characteristics at several different locations (Figure 4). Color of soil strata are described in terms of texture, 'value' and 'chroma' according to a Munsell Soil Color Chart. The wetland delineation line was then completed by walking with a handheld Garmin GPSmap 64st GPS unit.

Datapoint locations representing boundary-flag positions (real flags were not used in the field) are listed in Appendix B. Coordinates are in UTM NAD83.

Wetland habitat was identified by establishing the presence of dominating hydric vegetation, of hydric soils and of hydrological markers such as surface water, soil saturation and channeling. The wetland edge was identified with Data Points (DPs) (wetland and upland) which straddled the boundary. Data sheets are included in Appendix C.

## Results

The wetland boundaries delineated during this survey are shown in the schematic in Figure 4. Photos of each datapoint location are shown in Appendix D. Below is a brief description of factors at each datapoint leading to the determination of wetland or upland conditions:

## DP 2, 4, 5, 6, 8 (Wetland)

These datapoints all represent essentially the same habitat: Shrub Swamp or Forested Wetland. Several examples of this habitat were sampled in order to ensure the presence of this habitat along the boundaries of the PIDs outside the natural wetland countours.

Soils were water-saturated with a water-table within approximately 10cm of the soil surface. Soils were also either depleted in color indicating prolonged saturation, or composed entirely of peaty organic material typical of wetlands. These samples were dominated by wetland plants such as Red Maple (*Acer rubrum*), Mountain Holly (Nemopanthus mucronatus), Speckled Alder (*Alnus incana*) and Cinnamon Fern (*Osmunda cinnamomea*).

## DP 1 (Wetland)

This datapoint describes a relatively small open, marshy area which occupies less than 10% of the total wetland area. Grasses, sedges and rushes dominate this area. Open, stagnant water is present here and virtually nowhere else on site. Drainage channels are not present but water is ponded in linear pools.

## DPs 3, 7 (Upland)

These datapoints displayed no hydrological indicators such as saturation or high watertable. If depletion was present due water-saturation in the recent past, it was only in less than approximately 50% of the sample. Plants were generally facultative wetland species but upland dominants such as Bracken Fern (*Pteridium aquilinum*) were abundant.

### Conclusion

Forested Wetland dominates the site. This is likely the reason for the disparity between the mapped GeoNB wetland and the polygon delineated on the ground. Forested wetland is difficult to tell apart from other upland forests from interpretation of aerial photographs alone. Marsh and Shrub wetlands are also present.

The wetland delineated during this study was approximately 14 hectares in size. The corresponding GeoNB wetland polygon is only approximately 3 hectares (occurring within the PIDs in question).

The wetland boundaries appear to extend well beyond the edge of the PIDs in question.

It should be noted that this is considered an Atypical Situation since this wetland system in influenced by pre-existing human activity in the form of infilling, excavation, road-building and culverting.

## Closing

I trust this information meets your current needs. Please feel free to contact me via telephone at (506) 227-7605 or by email at <u>tpopma@nb.sympatico.ca</u> if further clarification or explanation is required.

Sincerely,

Agrima

Theo Popma BSc, MSc. President, Overdale Environmental Inc.

### Sources:

The Canadian Wetland Classification System, 2<sup>nd</sup> ed. 1997. National Wetlands Working Group. Wetlands Research Center, University of Waterloo, ONT.

Environmental Laboratory. (1987). "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Field Indicators of Hydric Soils in the United States; Guide for Identifying and Delineating Hydric Soils, Version 8.1, 2017

Hinds, H. 2000. The Flora of New Brunswick.

Lichvar, R., 2005. Wetland Identification, Delineation and Classification. Humbolt Field Research Institute, Steuben, ME, USA.

U.S. Army Corps of Engineers. 200X. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-0X-XX. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

US Army Corps of Engineer Wetland Delineation Manual. 1987.

US Department of Fish and Wildlife. 1988. National List of Plant Species that occur in Wetlands.

## LAKEBURN WETLAND DELINEATION APPENDIX A: Figures

## Figure 1. Survey Area





Figure 2. GeoNB mapped wetland at PIDs 70007117, 70495908, 70473947.



Figure 3. Wetland Delineation Study Area



Figure 4. Wetland Delineation Schematic and Datapoint Locations

## LAKEBURN WETLAND DELINEATION APPENDIX B: Datapoint and flag positions

Datapoints

ID	Easting	Northing
1	372894.859	5104235.126
2	372964.044	5104363.969
3	372946.573	5104368.221
4	373143.63	5104381.603
5	373303.99	5104265.809
6	373400.556	5103959.258
7	373224.068	5104227.44
8	373388.457	5104363.44

Flags

Order	Easting	Northing
1	373323.305	5104365.813
2	373323.758	5104361.772
3	373320.979	5104328.26
4	373307.28	5104312.87
5	373302.506	5104314.578
6	373286.565	5104324.857
7	373273.06	5104330.137
8	373257.509	5104341.24
9	373239.089	5104340.73
10	373220.266	5104320.666
11	373210.997	5104321.302
12	373195.705	5104333.733
13	373188.635	5104347.217
14	373180.974	5104362.047
15	373186.18	5104375.414
16	372978.642	5104389.122
17	372970.288	5104374.178
18	372964.044	5104363.969
19	372937.388	5104342.956
20	372927.131	5104336.943
21	372917.047	5104324.369
22	372894.859	5104235.126
23	372897.936	5104226.837
24	372903.427	5104219.276

25	372907.982	5104211.401
26	372910.242	5104208.465
27	372928.423	5104178.633
28	372944.914	5104164.398
29	372957.012	5104150.921
30	372970.018	5104140.204
31	372976.556	5104123.395
32	372981.353	5104115.96
33	372996.237	5104102.536
34	373010.73	5104103.904
35	373016.244	5104108.681
36	373021.491	5104111.796
37	373041.384	5104119.945
38	373050.98	5104127.638
39	373060.768	5104137.107
40	373067.53	5104142.414
41	373082.475	5104150.664
42	373090.844	5104166.386
43	373096.972	5104174.708
44	373109.104	5104189.13
45	373116.153	5104197.098
46	373127.523	5104219.539
47	373132.934	5104238.101
48	373165.17	5104252.109
49	373173.876	5104261.711
50	373183.324	5104265.962
51	373211.44	5104264.048
52	373241.735	5104258.977
53	373245.77	5104244.555
54	373246.294	5104239.987
55	373254.234	5104231.154
56	373268.866	5104212.956
57	373280.368	5104196.824
58	373289.06	5104183.195
59	373290.534	5104168.381
60	373273.531	5104142.833
61	373277.293	5104115.189
62	373298.835	5104108.62
63	373307.619	5104111.563
64	373326.699	5104129.066
65	373343.622	5104124.493

66	373351.439	5104124.666
67	373362.438	5104121.661
68	373368.182	5104111.316
69	373377.106	5104093.903
70	373375.108	5104087.053
71	373371.892	5104069.89
72	373366.242	5104058.447
73	373348.457	5104051.255
74	373329.244	5104046.093
75	373314.232	5104030.84
76	373314.748	5104007.043
77	373312.226	5103993.534
78	373312.256	5103976.193
79	373298.992	5103955.681
80	373288.931	5103933.921
81	373307.627	5103924.269
82	373340.296	5103902.921
83	373356.684	5103898.582
84	373366.792	5103889.815
85	373462.618	5103858.831
86	373502.916	5103884.901
87	373500.856	5103912.621
88	373488.299	5103926.44
89	373458.754	5103945.5
90	373453.72	5103952.717
91	373443.962	5103955.919
92	373433.344	5103962.473
93	373423.27	5103965.348
94	373411.01	5103967.268
95	373385.479	5103967.127
96	373361.175	5103970.184
97	373362.554	5103954.483
98	373335.577	5103932.919
99	373330.316	5103962.928
100	373340.459	5103982.171
101	373361.322	5103999.859
102	373363.475	5104006.706
103	373369.464	5104015.809
104	373381.396	5104028.012
105	373393.409	5104055.442
106	373386.036	5104073.045

107	373395.04	5104078.306
108	373398.476	5104091.129
109	373410.413	5104111.113
110	373421.442	5104124.558
111	373433.764	5104133.197
112	373445.643	5104139.066
113	373460.995	5104159.647
114	373470.819	5104174.673
115	373477.268	5104191.102
116	373488.099	5104202.439
117	373508.255	5104230.924
118	373523.547	5104237.279
119	373534.571	5104235.496
120	373547.215	5104229.678
121	373585.902	5104230.217
122	373599.994	5104229.56
123	373592.478	5104245.31
124	373580.262	5104249.34
125	373567.257	5104256.388
126	373544.447	5104275.642
127	373532.609	5104286.778
128	373521.632	5104302.121
129	373508.058	5104304.068
130	373507	5104320.318
131	373496.719	5104343.205

## LAKEBURN WETLAND DELINEATION APPENDIX C: Wetland Datasheets

Project Site	lakebu	rn							Date	· 26	λ-Δι	IG-18			Sample	Poir	nt· 1			loh	<i>#</i> ·		
Client/own		hor F	naineeri	na					Field	. 20	tian			Ponma	ampie		n.   I			100	π.		
County:			. iyineefi d	ng					Coor	dinata	uyd e	αυ(s). Π	ie0 I	орпа									
	vvestm	onand	u						Dom	ormol	s.	ironmonte		nditiono	aviat .		~?	Vaa			No		
PID 704735	47								Don	orman	env	nonmenta		nullions	exist (	วท-รแ	er	res	x		INO		
lf no ovoloi	<b>.</b> .																						
ii no, expia	n.																						
			×				-		<u> </u>														
Atypical S	tuation		Yes x		·		Ехр	iain: 0	Cuivert, c	learing	g ar	na roadwa	iy ar	recting c	irainag	e							
is this a po	entialPro	blem	n Area?		_	Yes			NOX	Ex	kpla	ain:											
Wetlend							_			-			_						_				—
wetland D	etermina	ation							_		+		+		_	-			_				
Check One	Only Fo	reac	ch Criteri	a)															-				
		,		(===)							_	. 🗖	-										
Dominant F	lydrophyt	IC Ve	getation	(50/20 rt	ile)				Yes	x		NO .				We	tland De	etermi	nation				
Wetland Hy	drology	_							Yes	x	N	NO .								_			
Hydric Soil	3	~							Yes	x		NO	-			х	YES	_	N	D			
Wetland I	ype:	Shru	ub Swan	np												-							
kational fo	or Detern	nınat	ion:	Marshy	/ part	ot ove	erall :	shrub	swamp							-							
				+	+						-	_	-			-				$\vdash$			
regetation	1     				01.7	1		Dom	inant				-	++	_								
Tree St	ratum: (F	'lot si	ize: 9m	<u>12)</u>	%C	over		Spec	les	Inc	dica	ator Statu	S		Do	mina	nce Te	st Wor	ksheet	:			
					4.0	L							-	+		( D							
1	Acer ru	ıbrum	1		10			X		fac	С				# 0	t Don	ninant S	pecies			•		
2	Picea	glauca	9		5			X		fac	С				tha	t are	OBL,FA	CW,F	AC:		6		
3	Ables I	balsai	mea		5			х		tac	С								_				
4										_		-	_		Tot	al # c	of Domin	ant			_		
5					-					_					Spe	ecies	across	all stra	<u>ita:</u>		6		
6										_		-	-	_					_				
										_			-	_	% (	of Do	minant \$	Specie	S				
	_				20		=	Tota	I Cover				-		tha	t are	OBL,FA	CW,F	AC:		100		
Shrub	Stratum:	(Plot :	size: 5r	<u>n2)</u>	_														_				
										_			-	_									
1	Alnus i	ncana	9		15			х		fac	cw	-			Pre	vale	nce In	dex W	orkshe	et:			
2										_							lotal %	Cover	<u>of:</u>		Multip	ly by	<u>.</u>
3										_					OB	L Sp	ecies		_		x 1 =		0
4										_					FA	CW S	Species		_		x 2 =		0
5										_			-	_	FA	C Sp	ecies		_		x 3 =		0
					15		=	l ota	I Cover		+		_		FA	CUS	pecies				x 4 =		U C
										_	-				ULI	- Sp	ecies	-			x 5 =		<u>U</u>
Herb S	tratum: (F	-lot S	<u>iize: 1n</u>	<u>n2)</u>	-					_	+		-	##	Col	umn	Iotals:						0
-					4.0	L							_		_	-	Preval	ence l	ndex =	B/A	=	##	
1	Lycopu	s unif	norus		10					fac	CW4	+	_			-							
2	Lysima	cnia t	terrestris	1	15			X		tac	CW4	+	-	++									
3	Carex	canes	cens		5					ob	01		-	++	Hye	arop	nytic Ve	egetati	on Indi	Icato	ors:		
4	Glyceri	a stria	ata		25			х		fac	CW		-	++	x	Кар	Id lest	for Hyd	Irolic Ve	egeta	ition		
5	Calama	agrost	tis canad	aensis	10				_	fac	CW		_		х	Don	ninance	rest is	s >50%				
					67			-			+		_			Pre	valence	index i	s <u>&lt;</u> 3.0'	. 1/			
					65		=	l ota	I Cover		+		_			Mor	phologic	al Ada	ptations	s'(ex	plain)	1,	_
											+		_			Pro	olematic	Hydro	phytic \	Vege	tation	(exp	lai
					-					_	+		-		1.	P		1					
0													_		'Inc	ncato	ors of hy	dric so	and w	velan	d hydi	rolog	y
Comm	ents	-											_		mu	st be	present	t, unles	is distu	rbed	or		
		-											_		pro	blem	atic						
		-											-	++	_	-							
		-															_						
												H	ydro	ophytic	Vegeta	ation	Preser	nt?	Ye	S	Х	No	

Priv	marv 🗆	vdrologic	- al In-	dicator	e./m	inimum	of one in	requir	ed check	all that	annly)			-					50	10	
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x	Soturo	tion (A2)	e (AZ	.)	-		A	qualic r	-auria (D	5)			_				_				
x	Motor	norko			-			an Dep		5) Odor ((	1)		_	-				-			
	Cadima		ite (F	20)	-			/ulogel	Dhiman		//) 	Dente (	<u>()</u>	-			_	-			
	Seaim	ent Depos	ans (E	52)	-			kiaizea	Rhizosp	neres d		ROOLS (	(3)			-		-			
		eposits (B	3) at (D	4)	-		PI	esence	e of Redu	cea iroi	1 (C4)	a (CC)	-			-		-	-		
	Algari		St (В4	+)	-				on reduc		lilea Soli	s (C6)	_				_	-	_		
	Iron De	eposits (B	5)	A		(D7)	Ir		K Sunac	e (C7) Deve	- >		_				_	-	_		
	Inunda		e on	Aeriai ir	nage	ery (B7)	<u> </u>	ner (E	xpiain in	Remark	.s)					_	_	-	_		
0	Sparse	ay vegeta		Joncave	Sur	lace (B8	)						_				_	-	_		
<u>5ec</u>	condar	/ Indicate	ors:(n		1 OF L	wo requi	<u>rea)</u>		0,	I Di	(54)		_				_	-	_		
	Surfac	e Soil Cra	CKS (	B6)	-		St	unted	or Stress	ed Plar	its (D1)		_	-		_	_	-	_		
x	Draina	ge Patterr	IS (B	10)	-		G	eomorp		ion (D2	)						_	-			
	Moss	Irim Lines	(B16	5)			SI	hallow /	Aquitard	(D3)			_	-		_	_	-	_		
	Dry-Se	ason Wat	er la	ible (C2	)		M	crotop	ographic	Relief (	D4)		_				_	-	_		
	Crayfis	n Burrows	s (C8	)			F/	AC-Neu	itrai lest	(D5)				-	$\vdash$		_	-			
	Satura	tion Visibl	e on	Aeriai Ir	nage	ery (C9)							_	-				-			
<u>Fiel</u>	Id Obse	rvations:	-		-													-	_		
Sur	tace W	ater Prese	ent?	Ye	s x	No	Depth	25cr	n					_							
Wa	iter labi	e Present	?	Ye	s x	No	Depth	5cm			Wetlan	d Hydi	ology	/ Pre	sent?	,	Ye	s	х	NO	
Sat	uration	Present?		Ye	SX	No	Depth	0cm					_	_			_	_	_		
Soi	il Profil	e																			
Soi Pro	il Profil ofile De	e scription:	:(Des	cribe to	the	depth ne	eded to	docum	ent the in	ndicato	or confir	m the	absen	ce of	indica	ators)	)				
Soi Pro Dep	il Profil ofile De oth(cm)	e scription: <u>Mat</u>	(Des	cribe to	the	depth ne	eded to	docum	ent the ir Redox	ndicator	or confir	m the a	absen	ce of	indica	ators)	)				
Soi Pro Dep	il Profil ofile De oth(cm)	e scription: <u>Mat</u> Color(m	:(Des trix oist)	cribe to	the <u>%</u>	depth ne	eded to	docum noist)	ent the ir Redox	ndicator Feature	or confires	m the : 	absen <u>oc²</u>	ce of	indica	ators) <u>T</u>	) exture	2		Ren	nark
Soi Pro Dep 6cm	il Profil ofile De oth(cm)	e scription: <u>Mat</u> Color(m	:(Des irix oist)	cribe to	the <u>%</u>	depth ne	eeded to	docum <u>noist)</u>	ent the ir	ndicator Feature	or confir es <u>Type<sup>1</sup></u>	m the : 	absen	ce of		ators) <u>T</u> Orgar	) Texture	2		Ren	nark
Soi Pro Dep 6cm 6 to	il Profil ofile De oth(cm) n o 30+cm	e scription: <u>Mat</u> Color(m 7.5YR 5	(Des trix oist) 5.2	cribe to	the <u>%</u>	depth ne	eded to	docum noist)	ent the ir Redox	ndicator Feature	or confires	rm the :	absen	ce of	indica (	ators) <u>T</u> Orgar Fines	) Texture	2		Ren	nark
Soi Pro Dep 6cm 6 to	n 030+cm	e scription: <u>Mat</u> <u>Color(m</u> 7.5YR 5	:(Des trix oist) 5.2	cribe to	the <u>%</u>	depth ne	eeded to	docum noist)	ent the ir <u>Redox</u>	ndicator Feature	or confir es <u>Type<sup>1</sup></u>	m the :	absen	ce of	indica (	ators) <u>T</u> Orgar Fines	) Texture	2		Ren	nark
Soi Pro Dep 6cm 6 to	il Profil ofile De oth(cm) n o 30+cm	e scription: <u>Mat</u> Color(m 7.5YR 5	(Des <u>trix</u> oist) 5.2	cribe to	the <u>%</u>	depth ne	eeded to	docum	Redox	ndicatol Feature	or confir es <u>Type<sup>1</sup></u>	m the :	absen	ce of	indica (	ators) <u>T</u> Orgar Fines	) Texture	2		Ren	nark
Soi Pro Dep 6cm 6 to	il Profil ofile De oth(cm) n o 30+cm	e scription: Color(m 7.5YR 5	:(Des <u>rrix</u> oist) 5.2	cribe to	the <u>%</u>		Color(r	docum	ent the in	ndicator	or confir s <u>Type<sup>1</sup></u>	m the :	absen	ce of	indica (	ators) <u>T</u> Orgar Fines	) Texture	2		Ren	<u>nark</u> :
Soi Pro Der 6cm 6 to	il Profil ofile De oth(cm) n o 30+cm	e <u>Mat</u> scription: <u>Color(m</u> 7.5YR §	(Des rix oist) 5.2	Cribe to	the %		Color(r	docum noist)	Redox	hdicator	r or confir es Type <sup>1</sup>		absen	ce of	indica (	ators) <u>T</u> Orgar Fines	) Texture hic	2		Ren	nark
Soi Pro Dep 6cm 6 to	il Profil ofile De oth(cm) n o 30+cm	e scription: Color(m 7.5YR 5	(Des rix oist) 5.2 on,D	cribe to	the <u>%</u>	depth ne	Color(r	docum noist) trix,CS	ent the ir Redox	hdicator Feature %	r or confir es Type <sup>1</sup>	m the :	absen	ce of	indica ( F	ators) I Orgar Fines ⊧Pore	) <u>exture</u> hic	<u>2</u> g,M=	=Matri	Ren	nark
Soi Pro Dep 6cm 6 to	il Profil offile De oth(cm) n o 30+cm pe:C=C	e scription: Color(m 7.5YR 5	(Des trix oist) 5.2 on, D	cribe to	the <u>%</u> ion,F	depth ne	Color(n	docum noist) trix,CS	ent the ir <u>Redox</u>	ndicator Feature %	r or confir ss <u>Type1</u> ated San	m the :	absen DC <sup>2</sup>		indica ( F	ators) I Orgar Fines	) Texture hic	<u>2</u> g,M=	=Matri	Ren X	nark
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<b>Soi</b> <b>Pro</b> <b>Dep</b> 6 cm 6 to 1 <sup>1</sup> Ty <b>Hyc</b>	il Profil file De bth(cm) n 0 30+cm pe:C=C dric So Histos	e Mai Scription: Color(m 7.5YR 5 0 ncentrati I Indicate ol (A1)	(A2)	=Deplet	the <u>%</u> ion,F	depth ne	Color(r	docum noist) trix,CS	edox (S5	dicator Feature % d or Co	r or confir es <u>Type</u> 1	d Grair	absen oc <sup>2</sup>	ce of	indica ( F	ators) I Drgar Fines	iexture iexture b Linin	<u>2</u>	=Matri	Ren 	nark
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<b>Soi</b> <b>Pro</b> Dep 6cm 6 to <sup>1</sup> Tyj <b>Hyc</b>	il Profil offile De oth(cm) o 30+cm o 30+cm o 30+cm o 30+cm o 4 dric So Histos Histos Histos Black	e Mai scription: Color(m 7.5YR 5 7.5YR 5 0 Color(m 7.5YR 5 0 Color(m 1 Indicate ol (A1) Epipedon Histic (A3	(Des irix oist) 5.2 on, D 5.2 (A2)	=Deplet	ion, F	depth ne	Color(r	docum noist) trix,CS andy R ripped ark Sur	edox (S5 Matrix (S faces (S)	d or Co	r or confir es <u>Type</u> 1 ated San	d Grair	absen	ce of	indica ( F	I Drgar Fines ₽Pore	E Linin	2 2 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■	Ren x	nark
<b>Soi</b> <b>Pro</b> Dep 6cm 6 to <sup>1</sup> Ty <b>Hyc</b>	il Profil file De bth(cm) a 30+cm b 30+cm b 30+cm b 30+cm b 30+cm b 30+cm b 30+cm b 30+cm b 30+cm b 40 b 40	e scription: scription: Color(m 7.5YR 5 7.5YR 5 0 concentrati I Indicate ol (A1) Epipedon Histic (A3 gen Sulfido	(Des irix oist) 5.2 on, D  (A2) ) ⇒ (A4)	=Deplet	ion,F	RM=Red	uced Ma	docum noist) trix,CS andy R andy R ripped	edox (S5 Below S Below S Second States (S7 Below S Suffort States (S7 Below S	d or Co	or confir ss Type <sup>1</sup>	m the	absen		indica ( F	ators) I Drgar Fines	E Linin	g,M=		x	
<b>Soi</b> <b>Pro</b> <u>Dep</u> 6 cm 6 to <sup>1</sup> Туј <b><u>Нус</u></b>	il Profil file De oth(cm) a 30+cm pe:C=C dric So Histos Histos Histos Histos Stratifi Deplet	e Mat scription: Color(m 7.5YR 5 7.5YR 5 0 Color(m 7.5YR 5 0 Color(m 1 Indicate 0 (A1) Epipedon Histic (A3 gen Sulfide ed Layers ad Below	(Des (rix oist) 5.2 (A2) ) (A2) ) ) (A2) ) ) (A5) ) Dark	=Deplet	ion,F	depth ne	uced Ma	docum noist) trix,CS andy R ripped ark Surr blyvalue	edox (S5 Matrix (S faces (S7 e Below S c Surface	d or Co.	ated San	d Grair	absen	ce of	indica ( F	ators) I Orgar Fines	l Linin	g,M=		Ren 	
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	ydrologica	I Indica	tors:(	<u>minimum</u>	of one is	required	check all t	hat apply)			_							
x Surfac	e Water (A	1)			W	ater Stair	ned Leaves	(B9)										
x High V	/ater Table	(A2)			Ac	quatic Fa	una (B13)											
x Satura	tion (A3)				Ma	arl Depos	its (B15)											
Water	marks				Ну	drogen S	Sulfide Odo	r (C1)										
Sedim	ent Deposit	s (B2)			0	kidized R	hizosphere	s on Living	Roots	(C3)								
Drift D	eposits (B3	)			Pr	esence o	f Reduced	Iron (C4)										
Algal N	Aat of Crust	(B4)			Re	ecent Iron	reduction	in tilled Soil	ls (C6)									
Iron De	eposits (B5)				Th	in Muck	Surface (C	7)										
Inunda	tion Visible	on Aeria	al Imag	gery (B7)	Ot	her (Expl	lain in Rem	arks)										
Sparse	ely Vegetate	ed Conc	ave Su	Irface (B8	3)													
Secondar	v Indicator	s:(minim	num of	two requ	ired)													
Surfac	e Soil Cracl	ks (B6)			St	unted or	Stressed F	Plants (D1)										
x Draina	ge Patterns	(B10)			Ge	eomorphie	c Position	(D2)										
Moss	Trim Lines (	B16)			Sł	allow Aq	uitard (D3)											
Dry-Se	ason Wate	r Table (	(C2)		Mi	crotopog	raphic Reli	ef (D4)										
Crayfis	h Burrows	(C8)			FA	C-Neutra	al Test (D5)											
Satura	tion Visible	on Aeria	al Imag	gery (C9)														
Field Obse	rvations:																	
Surface W	ater Presen	t?	Yesx	No	Depth	10												
Water Tab	e Present?		Yesx	No	Depth	5cm		Wetlan	nd Hyd	rolog	y Pre	sent?		Ye	s >	<	No	
Saturation	Present?		Yes	No	Depth	0cm												
	drology       imary Hydrological Indicators:         Surface Water (A1)       High Water Table (A2)         Saturation (A3)       Watermarks         Sediment Deposits (B2)       Drift Deposits (B3)         Algal Mat of Crust (B4)       Iron Deposits (B3)         Inundation Visible on Aerial Imar       Sparsely Vegetated Concave S         condary Indicators:(minimum of Surface Soil Cracks (B6)       Drainage Patterns (B10)         Moss Trim Lines (B16)       Dry-Season Water Table (C2)         Crayfish Burrows (C8)       Saturation Visible on Aerial Imar         3d Observations:       Irface Water Present?         Yees       yees         ituration Present?       Ye																	
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Profile De	scription:(i	Jescribe	e to the	e depth ne	eeded to	aocumen	it the indica	ator or conti	rm the	abser	ice of	Indica	tors)	)				
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<u>B optin(onity</u>	<u>Color(mo</u>	X iet)	- 0/		Color(r	noist)	Redox Fea	tures	_	00 <sup>2</sup>			т	ovture		_	Pom	ark
0 to 5cm	<u>Color(mo</u>	x ist)	%	<u> </u>	Color(r	noist)	Redox Fea	tures Type <sup>1</sup>		<u>.oc<sup>2</sup></u>		C	T Droar	exture		_	<u>Rem</u>	hark
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0 to 5cm 5 to 20cm	<u>Color(mo</u>	x ist)	<u>%</u>	· · · · · · · · · · · · · · · · · · ·	<u>Color(r</u>	noist)	Redox Fea	tures <u>Type<sup>1</sup></u>		<u>.oc<sup>2</sup></u>		C F	T Orgar Tines	<u>exture</u> nic			<u>Rem</u>	<u>nark</u>
0 to 5cm 5 to 20cm	<u>Color(mo</u>	x ist)	%		Color(r	noist)	Redox Fea	tures Type <sup>1</sup>		. <u>oc<sup>2</sup></u>		C	<u>T</u> )rgar ïnes	<u>exture</u> nic			Rem	narks
0 to 5cm 5 to 20cm	Color(mo	x	<u>%</u>		<u>Color(r</u>	noist)	Redox Fea <u>%</u>	tures Type <sup>1</sup>		<u>.oc<sup>2</sup></u>		C F	<u>T</u> )rgar ïnes	<u>exture</u> nic			Rem	<u>nark</u>
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0 to 5cm 5 to 20cm <sup>1</sup> Type:C=C Hydric So Histos Histic Black	Indicator oncentratio il Indicator ol (A1) Epipedon ( <i>A</i> Histic (A3)	x ist) n,D=Dep <u>s:</u> A2)		RM=Red	Color(r	trix,CS=0	Covered or ox (S5) atrix (S6) ces (S7)	tures Type <sup>1</sup> Coated Sar		.oc <sup>2</sup>		n:PL=	T Drgar iines	exture hic	), M=M	latri	Rem	narks
0 to 5cm 5 to 20cm <sup>1</sup> Type:C=C Hydric So Histos Histic Black Hydrod	Oncentratio	x ist) n,D=Dep <u>s:</u> (A4)	- %	RM=Red	Color(r	trix,CS=0	Covered or ox (S5) atrix (S6) ces (S7) Below Surfa	tures Type <sup>1</sup> Coated Sar		ns.2Lo		n:PL=	<u>I</u> Drgar iines	exture hic	), M=M	latri	Rem	
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0 to 5cm 5 to 20cm <sup>1</sup> Type:C=C Hydric So Histos Histos Histic Black Hydrog Stratifi Deplet	Oncentratio I OYR 4/1 IOYR 4/1 Oncentratio I Indicator ol (A1) Epipedon (A Histic (A3) gen Sulfide ed Layers ( ed Below D	x ist) n,D=Dep s: (A2) (A4) A5) ark Suff	_ %	RM=Red	Color(r	trix,CS=0	Covered or Covered or Cox (S5) atrix (S6) ces (S7) Below Surface (S9 yed Matrix	tures Type <sup>1</sup> Coated San		ns.2Lc		n:PL=	T Drgar ines	Lining	, м=м	latri	<u>Rem</u>	
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vvaterm	narks				Hydrogen	Sulfide Od	or (C1)					-			
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х	Saturati	ion (A3)					Ma	arl Depo	sits (B15	)											
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	Drift De	posits (B	3)				Pr	esence	of Reduc	ed Iron	(C4)										
	Algal M	at of Cru	st (B4	4)			Re	ecent Iro	n reducti	on in ti	led Soil	s (C6	i)								
	Iron Dep	oosits (B	5)				Th	in Muck	Surface	(C7)											
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Sec	condary	Indicate	ors:(m	ninimum	n of t	wo requi	red)														
	Surface	Soil Cra	cks (l	B6)			St	unted or	Stresse	d Plant	s (D1)										
	Drainag	e Patterr	is (B1	10)			Ge	eomorph	ic Positio	on (D2)											
	Moss T	rim Lines	(B16	6)			Sł	allow A	quitard (E	03)											
	Dry-Sea	ason Wat	er Ta	ble (C2)	)		Mi	crotopo	graphic R	lelief (D	94)										
	Crayfish	Burrows	s (C8)	)			FA	C-Neuti	al Test (	D5)											
	Saturati	ion Visibl	e on	Aerial Ir	nage	ery (C9)															
Fiel	ld Obser	vations:																			
Sur	face Wa	ter Prese	nt?	Ye	sx	No	Depth	5cm													
Wa	ter Table	Present	?	Ye	sx	No	Depth	15cm			Wetlan	d Hy	drolog	y Pre	sent?	2	Y	es	х	No	
Sat	uration F	Present?		Ye	sx	No	Depth	0cm													
Soi	il Profile																				
Soi Pro	il Profile ofile Des	cription:	(Des	cribe to	the	depth ne	eded to	docume	nt the inc	dicator	or confi	rm the	e absei	nce of	indica	ators	)				
Soi Pro Dep	il Profile ofile Des oth(cm)	cription: Mat	(Des rix	cribe to	the	depth ne	eded to	docume	nt the ind Redox F	dicator eature	or confir	rm the	e abser	nce of	indica	ators	) Fextur	·0		Rer	nark
Soi Pro Dep	il Profile ofile Des oth(cm)	cription: <u>Mat</u> <u>Color(m</u>	(Des rix oist)	cribe to	the <u>%</u>	depth ne	eded to	docume	nt the inc Redox F	dicator eature	or confir <u>s</u> Type <sup>1</sup>	rm the	e abser	nce of	indica	ators	) Fextur	<u>e</u>		Rer	narks
Soi Pro Dep	il Profile ofile Des oth(cm)	cription: <u>Mat</u> <u>Color(m</u>	(Des rix oist)	cribe to	the <u>%</u>	depth ne	eeded to	docume	nt the inc Redox F	dicator eature	or confir <u>s</u> Type <sup>1</sup>	rm the	e abser	nce of	indica	ators	) Fextur	<u>e</u>		Rer	narks
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Soi Pro Dep	il Profile Des offile Des oth(cm)	ncentrati	(Des rix oist) on,D=	cribe to	the <u>%</u> ion,F	depth ne	Color(r	docume noist) trix,CS=	nt the inc <u>Redox F</u> <u>%</u> Covered	dicator eature	or confir	rm the	e abser	ocatic	n:PL=	ators	) Fextur	re ng,M	=Matr	Ren	nark
Soi Pro Der	il Profile Des offie Des oth(cm) pe:C=Co dric Soil	cription: Mat Color(m	on,D=	cribe to	the <u>%</u> ion,F	depth ne	Color(r	docume noist) trix,CS=	nt the ind Redox F %	dicator	or confir s <u>Type<sup>1</sup></u> ted San	rm the	e abser	ocatic	n:PL=	ators	) Fextur	r <u>e</u> ng,M	=Matr	Rer	nark:
Soi Pro Der <sup>1</sup> Ty <u>Hyc</u>	il Profile Des offie Des oth(cm) pe:C=Co dric Soil Histoso	cription: Mat Color(m ncentrati	(Des rix oist) on,D:	cribe to	ion,F	depth ne	Color(r	docume noist) trix,CS=	nt the inc Redox F % % Covered dox (S5)	dicator eatures	or confir s <u>Type</u> 1 ted San	rm the	e abser	ocatic	n:PL=	ators	) Fextur	re ng,M	=Matr	Rer ix	nark
Soi Pro Dep <sup>1</sup> Ty <u>Hyc</u>	il Profile Des offile Des oth(cm) pe:C=Co dric Soil Histoso Histic E	cription: <u>Mat</u> <u>Color(m</u> ncentrati <u>Indicate</u> I (A1) pipedon	(Desining of the second	cribe to	ion, F	depth ne	Color(r	docume noist) trix,CS= andy Rea	nt the inc Redox F % Covered dox (S5) fatrix (S6	dicator eature or Coa	or confir Type <sup>1</sup> ted San	rm the	ains.2L		i indica	ators	) Fextur	ng,M	=Matr	ix	nark:
Soi Рго <u>Der</u> <sup>1</sup> Туј <u>Нус</u>	il Profile Des offile Des oth(cm) pe:C=Co dric Soil Histoso Histic E Black H	cription: <u>Mat</u> <u>Color(m</u> ncentrati <u>Indicate</u> I (A1) pipedon listic (A3	(Des rix oist) on,D= <b>Drs:</b> (A2)	=Deplet	ion,F	depth ne	Color(r	docume noist) trix,CS= andy Rea ripped M ark Surfa	nt the inc Redox F 22 Covered Covered Cox (S5) Natrix (S6 ices (S7)	or Coa	or confir	d Gra	ains.2L		n:PL=	ators 1 ₽Pore	) Fextur	ng,M	=Matr	ix	nark:
Soi Pro Der <sup>1</sup> Tyr Hyc	il Profile Des offile Des oth(cm) pe:C=Co dric Soil Histoso Histic E Black H Hydroge	cription: <u>Mat</u> <u>Color(m</u> <u>ncentrati</u> <u>Indicate</u> I (A1) spipedon listic (A3 en Sulfide	((Desi rix oist) on, D= Drs: ((A2) ) ≥ (A4)	=Deplet	ion,F	depth ne	Color(r	docume noist) trix,CS= andy Rec ripped M ark Surfa	And the inc Redox F 20 Covered Cove	dicator eature:	or confir Type <sup>1</sup> ted San	d Gra	ains.2L		indic:	ePore	) Fextur	e ng,M	=Matr	ix	
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-	Sedime	nt Denos	sits (F	32)	1		0	xidize	d Rh	izosnhe	eres or	Livina	Roote	s (C3)									
<u> </u>		nosits (R	3)	-,	-		P	resend	e of	Reduce	ad Iron	(C4)											
-	Algal M	at of Cru	st (R	4)	1		R	ecent	Iron I	reductio	n in ti	lled Soil	ls (Cf	3)									
<u> </u>	Iron Der	nosits (R	5)	•/	-		П	hin Mu	ck S	urface	(C7)		.5 ,00	-,									
<u> </u>	Inundeti	on Vieihl	e on	Aerial Ir	nace	erv (R7)		ther (F	- xnla	in in Re	mark	s)	-								-		
	Sparsel	v Vegeta	ated (	Concave	Sur	face (B8	)				/mark	5)											
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000	Surface	Soil Cra	cks (	B6)		<u>wo requi</u>		tunted	or S	tressed	l Plant	s (D1)											
-	Drainag	e Patterr	5.3 ( 15 (R	10)	-		6	ieomor	nhic	Positio	n (D2)		-								-		
<u> </u>	Mose T	rim   ines		3)	-		8	hallow	Aun	itard (D	( <i>DZ</i> ) 3)		-										
-	Dry-Sec	son Wa	ter Ta	ahle (C2)	\		N	licroto	nor	anhic P	oliof (F	04)	-								-		
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Iron De	nosits (B5)	51)				Thin Mu	ck Surface	ا (C.7) د										
Inundat	ion Visible or	ο Δerial In	nade	arv (B7)		Other (F	volain in F	2emark	c)				_					
Sparse	lv Venetated	Concave	Surf	ace (B8	3			Cinan	.5/									
Secondary	Indicators:	minimum	of ty	wo requi	ired)													
Surface	Soil Cracks	(B6)			<u></u>	Stunted	or Stress	ed Plan	ts (D1)									
Drainac	e Patterns (F	310)				Geomor	nhic Posit	ion (D2					_				_	
Mose T	rim Lines (B	16)				Shallow	Aquitard (	ראר (1011) רצח	/									
Dry-Se	ason Water T	Table (C2)				Microtor		Relief (I	D4)									
Cravfiel	h Burrows (C	8)				FAC-No	utral Test	(D5)										
Saturat	ion Visible or	∽, h Aerial In	nade	erv (C9)				(20)										
Field Obser	vations		l															
Surface Wa	ter Present?	Ve	2	No x	Der	oth												
Water Table	Present?	Yes	, ,	No x	Der	oth			Wetlan	d Hvdr	oloav	Prese	nt?		Yes		x	
Saturation F	Present?	Yes	` <u> </u>	No x	Der	oth			litenaii	<u></u>							_^	-
			-															
Soil Profile	e													\ \	_		_	
Soil Profile Profile Des	e scription:(De	scribe to	the o	depth ne	eded	to docun	nent the in	idicator	or confir	m the a	absenc	e of in	dicato	rs)				
Soil Profile Profile Des Depth(cm)	escription:(De Matrix	scribe to	the o	depth ne	eded	to docun	nent the ir <u>Redox</u>	idicator Feature	or confir	m the a	absenc	e of in	dicato	rs) Text	ure		Rer	nark
Soil Profile Profile Des Depth(cm)	e scription:(De <u>Matrix</u> Color(moist	scribe to	the o	depth ne	eded	to docun	nent the ir Redox	ndicator Feature <u>%</u>	or confir es <u>Type<sup>1</sup></u>	m the a	absenc	e of in	dicato	rs) <u>Text</u>	ure		Rer	nark
Soil Profile Profile Des Depth(cm) 0 to 5cm 5 to 25	Color(moist	escribe to	the o	depth ne	Col	or(moist)	nent the ir Redox	ndicator Feature	or confir es <u>Type<sup>1</sup></u>	m the a	absenc	e of in	dicato Org	rs) <u>Text</u> janic	ure am		Rer	nark
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Soil Profile Des Depth(cm) 0 to 5cm 5 to 25	a matrix Scription:(De Matrix Color(moist 10YR 4/2	scribe to	the o		Eeded	r(moist) (R 5/4	nent the ir Redox	60	or confir es Type <sup>1</sup>	m the a	absenc	e of in	dicato Org Sar	rs) <u>Text</u> anic ndy lo	<u>ure</u> am		Rer	mark
Soil Profile Des Depth(cm) 0 to 5cm 5 to 25	scription:(De Matrix Color(moist	D=Depleti	the of <u>%</u> 50	depth ne		r(moist) (R 5/4 Matrix,C	nent the ir Redox	adicator Feature 60	r or confir ss <u>Type1</u>	m the a	absenc	e of in	dicato Org Sar	rs) <u>Text</u> janic ndy lo	<u>ure</u> am	M=Ma	Rer	nark
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# LAKEBURN WETLAND DELINEATION APPENDIX D: PHOTOS



Fisher Engineering;	Datapoint 2	Shrub Swamp	Overdale
Lakeburn		Wetland	Environmental Inc.





Fisher Engineering; Lakeburn	Datapoint 5	Forested Wetland	Overdale Environmental Inc.





Fisher Engineering; Lakeburn	Datapoint 8	Forested Wetland	Overdale Environmental Inc.

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**APPENDIX C** 

RARE VASCULAR PLANT SURVEY



Rare Vascular Plant Survey Report: Lakeburn, NB

## PIDs 70007117, 70495908, 70473947

September 27, 2018

For

Michael Fisher, P.Eng Fisher Engineering Ltd. 40 Fairfield Road Lower Coverdale, NB E1J 0A2

By

Theo Popma MSc. (Wetland Delineator) Overdale Environmental Inc. 342 Highfield st. Moncton, NB E1C 5R6 tpopma@nb.sympatico.ca www.Overdale.net 506-227-7605

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## **1.0 INTRODUCTION AND METHODS**

A vascular plant survey was conducted on PID PIDs 70007117, 70495908 and 70473947 in Lakeburn, NB on July 30, 2018 (Figure 1). GPS points and photos were recorded as necessary to geographically locate prominent habitat-types or any species of conservation concern. All figures are shown in Appendix 4.

This survey was conducted as part of an Environmental Impact Assessment (EIA) concerning the development of a residential subdivision on the site. The PIDs in question were not surveyed in their entirety as per the scope of work defined by the client. The survey area is shown in Figure 1.

Rare vascular plant potential as estimated before the survey was considered to be low to moderate according to both the online Connell Herbarium at UNB and the Atlantic Canada Conservation Data Center (ACCDC). This is due to the relative scarcity of known element occurrences on the PID or in the vicinity. The ACCDC report is contained in Appendix 6.

### 2.0 RESULTS:

After approximately 2 days of surveying, 136 species of vascular plants were identified. No species of conservation concern were found. For a synopsis of the ranking system see Appendix 1. A full plant list is provided in Appendix 2. Photos of habitat-types are shown in Appendix 3. Lists of species assemblages representing each habitat are shown in Appendix 5. The track followed during the survey is shown in Figure 2. A map of approximate boundaries of the various habitat types encountered during the survey is shown in Figure 3.

## 2.1 Habitat Types

The habitat map shown in Figure 3 is an approximation. Although wetland habitat was well defined through the standard delineation process, other margins were not. Also, the upland forests were especially mixed in terms of age and species composition. This is likely the result of deforestation having occured at different times in different places on the site.

### 1. Tall Shrub Swamp

Tall shrubs such as Mountain Holly (*Nemopanthus mucronatus*) and Speckled Alder (*Alnus incana*) were present throughout all wetland habitat on the site except for the small marshy section in the northwest which was devoid of trees and shrubs. Low shrubs such as Leatherleaf (*Chamaedaphne calyculata*) were only locally common in clumps within the wetland. Trees were absent from wetland habitat only in one area nearest the culvert south of the new dirt road.

### 2. Marsh

This small wetland type was dominated by herbs, grasses, sedges and rushes such as Canada Bluejoint (*Calamagrostis canadensis*), Soft Rush (*Juncus effusus*) and Bugleweed (*Lycopus uniflorus*). Standing water less than 1m deep was present here but appeared not to be flowing in channels.

### 3. Forested Wetland

Tree were defined as having a diameter at breast height of greater than 15cm. Species such as Red Maple (*Acer rubrum*) and White Spruce (*Picea glauca*) were generally sparse. They occurred less than once every 5m in habitat defined as wetland by standard Wetland Delineation protocols. The understory was always dominated by Mountain Holly as described above. A small slope of approximately 1 or 2 meters defined the boundary of the wetland especially on the northeast boundary.

### 4. Lichen-dominated clearings

These clearing were upland habitats associated with Bracken Fern (*Pteridium aqulininum*) and Gray Birch (*Betula populifolia*). Open areas appeared to be partially the result of deforestation.

### 5. Mature Coniferous Forest

Trees here were sufficiently far apart to easily pass through on foot. Trees were approximately 50 years old or older. The understory was virtually completely absent both in the herb and shrub strata.

### 6. Tolerant Hardwood

This was one of the few regions on site to contain any White Ash (*Fraxinus Americana*). Although the other deciduous species in this small area were not as tolerant, such as Gray Birch, the herbaceous flora was marginally richer here than anywhere else on the site.

### 7. Larch-dominated Coniferous Forest

American Larch (Larix laricina) was infrequently scattered over most of the site, but it dominated certain habitats as well. These areas were predominantly coniferous with very little vegetation in the understory. Trees appeared to be less than 40 years old.

### 8, 9 and 10: Young, Moderate and Mature Mixed Forest

Dominated primarily by White Birch (Betula papyrifera) this was probably the most dominant habitat on the site. The boundaries of the different age classes are poorly defined but contained a consistent array of the common flora such as Sarsasparilla (*Aralia nudicaulis*),

Goldthread (*Coptis trifolia*) and Sheep Laurel (*Kalmia angustifolia*). Diversity here was relatively high compared to the other habitats.

#### 11. Young Boreal Forest

Trees in this habitat were generally less than a few centimeters in diameter and only a few feet apart. The understory was virtually non-existent except for a few Club-mosses. Dominant species were White Spruce and Balsam Fir (*Abies balsamea*).

#### 12. Intolerant Hardwood

Plant species diversity was relatively high here compared to the other habitats. Beaked Hazel (*Corylus cornuta*) occurred here and virtually nowhere else. Also present were typical species such as Yellow Blue-Bead Lilly (*Clintonia borealis*) and Northern Beech Fern (*Phegopteris connectilis*).

#### 2.2 Habitat Features

#### Pond

Ponded water occurred in the Marsh and appeared to be completely stagnant. It also occurred in small pockets less than 10m wide as a result of skidder activity where there was a high watertable.

#### Streams

One main inlet was identified near the southwest corner of the Shrub Swamp. Channelling was observed infrequently to the north so the main outlet probably lies a short distance off the boundary of PID 70495908. Small seeps were also observed but were mostly dried up this time of year.

#### Disturbance

Excavation, infilling and clearing have all occurred on the site near the existing dirt road which is an extension of Nature drive.

### 3.0 DISCUSSION

Species diversity of vascular plants for this area can be considered low to moderate as can the potential for the occurrence of rare species. Little or no encroachment of exotic invasive species was observed except near very disturbed areas such as the roadways and trails. Higher potential for species richness and diversity was observed in the northeast corner of the property where there is a relatively small patch of Tolerant Hardwood which appears to be bound by an old road to the south.

The ACCDC report indicates the occurrence of three S3S4 species and only one S3 species of vascular plant nearby. All four of these species are located at least 1.4km from the center of the study area in the Melanson Settlement Lake Environmentally Significant Area (ESA). They include:

Platanthera blephariglottis	White Fringed Orchid	S3
Eriophorum russeolum	Russet Cottongrass	S3S4
Geocaulon lividum	Northern Comandra	S3S4
Potamogeton oakesianus	Oakes' Pondweed	S3S4

Russet Cottongrass would be considered unlikely to occur on the site since it prefers calcareous environments. The study area shows insufficient species diversity or richness to be considered caclcareous. White Fringed Orchid is a showy species which is generally easy to identify in wet open places dominated by sphagnum moss. Only a small portion of the site matched this description and none were observed. Oakes' Pondweed also is unlikely to occur on site due to a lack of open, shallow water habitat. Finally,Northern Comandra could be expected to occur in the some of the coniferous-dominated areas of the site both in peaty and sandy soils. However, none were observed.

Records from the Connell Herbarium were also queried to identify potential occurrences of rare species in the area. None were found which corresponded to the site location.

### 4.0 CLOSING

I trust this information meets your current needs. Please feel free to contact me via telephone at (506) 227-7605 or by email at <a href="mailto:tpopma@nb.sympatico.ca">tpopma@nb.sympatico.ca</a> if further clarification or explanation is required.

Sincerely,

Agrima

Theo Popma BSc, MSc. President, Overdale Environmental Inc.

## 5.0 SOURCES

Gleason, H. A. & A. Cronquist. 1991. Manual of vascular plants of northeastern United States and adjacent Canada, ed. 2.

Hinds, H. R. 2000. Flora of New Brunswick, ed. 2.

Go Botany. 2018. New England Wild Flower Society. https://gobotany.newenglandwild.org/

#### LAKEBURN RARE PLANTS APPENDIX 1: RANKS

<u>S Rank, N Rank, G Rank</u>: Sub-national, National and Global Rarity rank of species, using CDC/NatureServe methods.

- 1 = Extremely rare (typically 5 or fewer occurrences or very few remaining individuals)
- 2 = Rare (6 to 20 occurrences or few remaining individuals)
- 3 = Uncommon throughout its range in the province, or found only in a restricted range, even if abundant in at some locations. (21 to 100 occurrences)
- 4 = Usually widespread). (100+ occurrences)
- 5 = Demonstrably widespread

NR = Not Ranked S1S2 = Range rank: in between S1 and S2, for example ? = Inexact numeric rank E= Exotic species

(For more info on NatureServe/CDC Ranks; http://www.natureserve.org/explorer/ranking.htm)

<u>GSrankCA, GSrank: General Status Rank for Canada and for New Brunswick</u>: These ranks are the product of the National General Status Working Group (NGSWG), under the direction of the Canadian Wildlife Directors Committee (CWDC). The Canadian Wildlife Service, Parks Canada and Fisheries and Oceans Canada (DFO) also participate.

- 1.1 Extinct
- 1.2 Extirpated
- 2 At risk
- 3 May be at Risk
- 4 Sensitive
- 5 Secure
- 6 Undetermined
- 7 Not Assessed
- 8 Exotic
- 9 Accidental

(For more information on NB GS Ranks: <u>http://www.wildspecies.ca/default.asp?Lang=En&n=56869CFA-1</u>

<u>SPROT and NPROT</u>: National conservation status of species, as designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) under the Canadian Species at Risk Act (SARA) and the Sub-national conservation status of species, as designated by given provincial jurisdiction (The New Brunswick Endangered Species Act).

Extinct Extirpated Endangered Threatened Special concern Not at risk Data deficient

LAKEBURN RARE PLANTS APPENDIX 2: PLANT LIST	

Scientific Name	Common Name	Srank
Carex retrorsa	Retrorse Sedge	S4
Monotropa hypopithys	Pinesap	S4
Platanthera clavellata	Club Spur Orchid	S4
Lycopodium complanatum	Northern Clubmoss	S4S5
Petasites frigidus	Northern Sweet Coltsfoot	S4S5
Rubus setosus	Bristly Blackberry	S4S5
Abies balsamea	Balsam Fir	S5
Acer rubrum	Red Maple	S5
Acer spicatum	Mountain Maple	S5
Actaea rubra	Red Baneberry	S5
Alnus incana	Speckled Alder	S5
Amelanchier laevis	Smooth Serviceberry	S5
Anaphalis margaritacea	Pearly Everlasting	S5
Apocynum androsaemifolium	Spreading Dogbane	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Betula papyrifera	Paper Birch	S5
Betula populifolia	Gray Birch	S5
Bidens frondosa	Devil's Beggarticks	S5
Calamagrostis canadensis	Bluejoint Reed Grass	S5
Calla palustris	Wild Calla	S5
Carex arctata	Black Sedge	S5
Carex brunnescens	Brownish Sedge	S5
Carex crinita	Fringed Sedge	S5
Carex debilis	White-edged Sedge	S5
Carex echinata	Star Sedge	S5
Carex magellanica	Boreal Bog Sedge	S5
Carex stipata	Awl-fruited Sedge	S5
Carex stricta	Tussock Sedge	S5
Chamaedaphne calyculata	Leatherleaf	S5
Cicuta maculata	Spotted Water-Hemlock	S5
Clintonia borealis	Yellow Bluebead Lily	S5
Comptonia peregrina	Sweet-fern	S5
Coptis trifolia	Goldthread	S5
Cornus canadensis	Bunchberry	S5
Corylus cornuta	Beaked Hazel	S5
Cypripedium acaule	Pink Lady's-Slipper	S5
Dalibarda repens	Dewdrop	S5
Danthonia spicata	Poverty Oat Grass	S5
Dennstaedtia punctilobula	Eastern Hay-Scented Fern	S5
Doellingeria umbellata	Hairy Flat-top White Aster	S5
Drosera rotundifolia	Round-leaved Sundew	S5

Scientific Name	Common Name	Srank
Dryopteris cristata	Crested Wood Fern	S5
Dulichium arundinaceum	Three-Way Sedge	S5
Eleocharis acicularis	Needle Spikerush	S5
Eleocharis obtusa	Blunt Spikerush	S5
Epigaea repens	Trailing Arbutus	S5
Epilobium leptophyllum	Bog Willowherb	S5
Equisetum arvense	Field Horsetail	S5
Equisetum sylvaticum	Woodland Horsetail	S5
Erechtites hieraciifolia	Eastern Burnweed	S5
Eriophorum virginicum	Tawny Cottongrass	S5
Eurybia macrophylla	Large-leaved Aster	S5
Euthamia graminifolia	Grass-leaved Goldenrod	S5
Fragaria virginiana	Wild Strawberry	S5
Fraxinus americana	White Ash	S5
Galium trifidum	Three-petaled Bedstraw	S5
Gaultheria hispidula	Creeping Snowberry	S5
Gaylussacia baccata	Black Huckleberry	S5
Glyceria canadensis	Canada Manna Grass	S5
Glyceria striata	Fowl Manna Grass	S5
Hypericum canadense	Canada St John's-wort	S5
Hypericum ellipticum	Pale St John's-Wort	S5
llex verticillata	Common Winterberry	S5
Impatiens capensis	Spotted Jewelweed	S5
Iris versicolor	Harlequin Blue Flag	S5
Juncus effusus	Soft Rush	S5
Juncus tenuis	Slender Rush	S5
Kalmia angustifolia	Sheep Laurel	S5
Kalmia polifolia	Pale Bog Laurel	S5
Larix laricina	Tamarack	S5
Ledum groenlandicum	Common Labrador Tea	S5
Linnaea borealis	Twinflower	S5
Luzula multiflora	Common Woodrush	S5
Lycopodium dendroideum	Round-branched Tree-clubmoss	S5
Lycopus uniflorus	Northern Water Horehound	S5
Lysimachia terrestris	Swamp Yellow Loosestrife	S5
Maianthemum trifolium	Three-leaved False Soloman's Seal	S5
Mitchella repens	Partridgeberry	S5
Moehringia lateriflora	Blunt-leaved Sandwort	S5
Monotropa uniflora	Indian Pipe	S5
Nemopanthus mucronatus	Mountain Holly	S5
Oclemena acuminata	Whorled Wood Aster	S5
Oenothera perennis	Perennial Evening Primrose	S5

Scientific Name	Common Name	Srank
Onoclea sensibilis	Sensitive Fern	S5
Osmunda cinnamomea	Cinnamon Fern	S5
Osmunda regalis	Royal Fern	S5
Panicum capillare	Common Witch Grass	S5
Phegopteris connectilis	Northern Beech Fern	S5
Picea glauca	White Spruce	S5
Picea rubens	Red Spruce	S5
Poa pratensis	Kentucky Blue Grass	S5
Populus tremuloides	Trembling Aspen	S5
Potentilla simplex	Old Field Cinquefoil	S5
Prenanthes trifoliolata	Three-leaved Rattlesnakeroot	S5
Prunella vulgaris	Common Self-heal	S5
Prunus pensylvanica	Pin Cherry	S5
Pteridium aquilinum	Bracken Fern	S5
Rhododendron canadense	Rhodora	S5
Rhynchospora alba	White Beakrush	S5
Rhynchospora alba	White Beakrush	S5
Rosa nitida	Shining Rose	S5
Rubus idaeus	Red Raspberry	S5
Rubus pubescens	Dwarf Red Raspberry	S5
Rumex orbiculatus	Greater Water Dock	S5
Salix bebbiana	Bebb's Willow	S5
Salix eriocephala	Cottony Willow	S5
Sambucus racemosa	Red Elderberry	S5
Scirpus cyperinus	Common Woolly Bulrush	S5
Scirpus microcarpus	Small-fruited Bulrush	S5
Solidago canadensis	Canada Goldenrod	S5
Solidago rugosa	Rough-stemmed Goldenrod	S5
Solidago uliginosa	Northern Bog Goldenrod	S5
Sorbus americana	American Mountain Ash	S5
Spiraea alba	White Meadowsweet	S5
Spiraea tomentosa	Steeplebush	S5
Symphyotrichum puniceum	Purple-stemmed Aster	S5
Thelypteris palustris	Eastern Marsh Fern	S5
Torreyochloa pallida	Pale False Manna Grass	S5
Triadenum fraseri	Fraser's Marsh St John's-wort	S5
Trientalis borealis	Northern Starflower	S5
Trillium undulatum	Painted Trillium	S5
Typha angustifolia	Narrow-Leaved Cattail	S5
Typha latifolia	Broad-leaved Cattail	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5
Viburnum nudum	Northern Wild Raisin	S5

Scientific Name	Common Name	Srank
Viola cucullata	Marsh Blue Violet	S5
Barbarea vulgaris	Yellow Rocket	SNA
Euphrasia nemorosa	Common Eyebright	SNA
Festuca filiformis	Hair Fescue	SNA
Leontodon autumnalis	Fall Dandelion	SNA
Leucanthemum vulgare	Oxeye Daisy	SNA
Phleum pratense	Common Timothy	SNA
Plantago major	Common Plantain	SNA
Tanacetum vulgare	Common Tansy	SNA
Trifolium repens	White Clover	SNA
Vicia cracca	Tufted Vetch	SNA

07/10/2018 03:07 Habitat 1 Shrub Wetland

LAKEBURN RARE PLANTS APPENDIX 3: HABITAT PHOTOS






























Figure 1. Project Location and Survey Area

# Figure 2. Survey Tracks



# Figure 3. Habitat Map



# LAKEBURN RARE PLANTS APPENDIX 5: HABITAT SPECIES-ASSOCIATIONS

# Table 1: Shrub Swamp

Nemopanthus mucronatus	Mountain Holly	S5
Alnus incana	Speckled Alder	<b>S</b> 5
Osmunda cinnamomea	Cinnamon Fern	<b>S</b> 5
Viburnum nudum	Northern Wild Raisin	<b>S</b> 5
Maianthemum trifolium	Three-leaved False Soloman's Seal	S5
Rubus pubescens	Dwarf Red Raspberry	<b>S</b> 5
Onoclea sensibilis	Sensitive Fern	S5

# Table 2: Marsh

Calamagrostis	Bluejoint Reed Grass	S5
canadensis		
Glyceria striata	Fowl Manna Grass	S5
Juncus effusus	Soft Rush	S5
Lysimachia terrestris	Swamp Yellow Loosestrife	S5
Lycopus uniflorus	Northern Water Horehound	S5
Calla palustris	Wild Calla	S5

## Table 3: Forested Wetland

Acer rubrum	Red Maple	S5
Nemopanthus mucronatus	Mountain Holly	S5
Betula populifolia	Gray Birch	S5
Picea glauca	White Spruce	S5
Viburnum nudum	Northern Wild Raisin	S5
Alnus incana	Speckled Alder	S5
Osmunda cinnamomea	Cinnamon Fern	S5
Kalmia angustifolia	Sheep Laurel	S5
Maianthemum trifolium	Three-leaved False Soloman's Seal	S5
Rhynchospora alba	White Beakrush	S5

# Table 4: Lichens

Betula populifolia	Gray Birch	S5
Picea glauca	White Spruce	S5
Pinus strobus	Eastern White Pine	S5
Pteridium aquilinum	Bracken Fern	S5
Gaultheria procumbens	Eastern Teaberry	S5
	Lichens	

# Table 5: Mature Coniferous Forest

Abies balsamea	Balsam Fir	S5
Picea glauca	White Spruce	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Cornus canadensis	Bunchberry	S5

# Table 6: Tolerant Hardwood

Fraxinus americana	White Ash	<b>S</b> 5
Acer rubrum	Red Maple	<b>S</b> 5
Betula populifolia	Gray Birch	S5
Abies balsamea	Balsam Fir	<b>S</b> 5

# Table 7: Larch

Larix laricina	Tamarack	S5
Betula papyrifera	Paper Birch	S5
Betula populifolia	Gray Birch	S5
Abies balsamea	Balsam Fir	S5
Picea glauca	White Spruce	S5
Maianthemum trifolium	Three-leaved False Soloman's Seal	S5
Osmunda cinnamomea	Cinnamon Fern	S5
Nemopanthus mucronatus	Mountain Holly	S5
Kalmia angustifolia	Sheep Laurel	S5
Viburnum nudum	Northern Wild Raisin	S5
Sphagnum spp.	Moss	

# Table 8: Young Cutover Mixed Forest

Betula populifolia	Gray Birch	S5
Abies balsamea	Balsam Fir	S5
Kalmia angustifolia	Sheep Laurel	S5
Viburnum nudum	Northern Wild Raisin	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Coptis trifolia	Goldthread	S5
Pteridium aquilinum	Bracken Fern	S5

# Table 9: Moderate Aged Deciduous

Populus tremuloides	Trembling Aspen	S5
Acer rubrum	Red Maple	S5
Betula papyrifera	Paper Birch	S5
Abies balsamea	Balsam Fir	S5
Pteridium aquilinum	Bracken Fern	S5
Cornus canadensis	Bunchberry	S5
Doellingeria umbellata	Hairy Flat-top White Aster	S5
Aralia nudicaulis	Wild Sarsaparilla	S5

### Table 10: Mature Mixed Forest

Acer rubrum	Red Maple	S5
Abies balsamea	Balsam Fir	S5
Betula papyrifera	Paper Birch	S5
Picea glauca	White Spruce	S5
Cypripedium acaule	Pink Lady's-Slipper	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5
Clintonia borealis	Yellow Bluebead Lily	S5
Pteridium aquilinum	Bracken Fern	S5

# Table 11: Boreal Forest

Picea glauca	White Spruce	S5
Abies balsamea	Balsam Fir	S5
Lycopodium complanatum	Northern Clubmoss	S4S5
Lycopodium dendroideum	Round-branched Tree-clubmoss	S5

#### Table 12: Intolerant Hardwood

Acer spicatum	Mountain Maple	S5
Betula papyrifera	Paper Birch	S5
Acer rubrum	Red Maple	S5
Corylus cornuta	Beaked Hazel	S5
Phegopteris connectilis	Northern Beech Fern	S5
Clintonia borealis	Yellow Bluebead Lily	S5



# DATA REPORT 6118: Lakeburn, NB

Prepared 25 July 2018 by J. Churchill, Data Manager



# **1.0 PREFACE**

The Atlantic Canada Conservation Data Centre (ACCDC) is part of a network of NatureServe data centres and heritage programs serving 50 states in the U.S.A, 10 provinces and 1 territory in Canada, plus several Central and South American countries. The NatureServe network is more than 30 years old and shares a common conservation data methodology. The ACCDC was founded in 1997, and maintains data for the jurisdictions of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. Although a non-governmental agency, the ACCDC is supported by 6 federal agencies and 4 provincial governments, as well as through outside grants and data processing fees. URL: www.ACCDC.com.

Upon request and for a fee, the ACCDC queries its database and produces customized reports of the rare and endangered flora and fauna known to occur in or near a specified study area. As a supplement to that data, the ACCDC includes locations of managed areas with some level of protection, and known sites of ecological interest or sensitivity.

1.1 DATA LI	<b>ST</b>
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Filename	Contents
LakeburnNB_6118ob.xls	All Rare and legally protected Flora and Fauna in your study area
LakeburnNB_6118ob100km.xls	A list of Rare and legally protected Flora and Fauna within 100 km of your study area
LakeburnNB_6118sa.xls	All Significant Natural Areas in your study area

#### **1.2 RESTRICTIONS**

The ACCDC makes a strong effort to verify the accuracy of all the data that it manages, but it shall not be held responsible for any inaccuracies in data that it provides. By accepting ACCDC data, recipients assent to the following limits of use:

- a) Data is restricted to use by trained personnel who are sensitive to landowner interests and to potential threats to rare and/or endangered flora and fauna posed by the information provided.
- b) Data is restricted to use by the specified Data User; any third party requiring data must make its own data request.
- c) The ACCDC requires Data Users to cease using and delete data 12 months after receipt, and to make a new request for updated data if necessary at that time.
- d) ACCDC data responses are restricted to the data in our Data System at the time of the data request.
- e) Each record has an estimate of locational uncertainty, which must be referenced in order to understand the record's relevance to a particular location. Please see attached Data Dictionary for details.
- f) ACCDC data responses are not to be construed as exhaustive inventories of taxa in an area.
- g) The absence of a taxon cannot be inferred by its absence in an ACCDC data response.

#### **1.3 ADDITIONAL INFORMATION**

The attached file DataDictionary 2.1.pdf provides metadata for the data provided.

Please direct any additional questions about ACCDC data to the following individuals:

#### Plants, Lichens, Ranking Methods, All other Inquiries

Sean Blaney, Senior Scientist, Executive Director Tel: (506) 364-2658 <a href="mailto:sblaney@mta.ca">sblaney@mta.ca</a>

Animals (Fauna) John Klymko, Zoologist Tel: (506) 364-2660 jklymko@mta.ca

#### Data Management, GIS

James Churchill, Data Manager Tel: (902) 679-6146 jlchurchill@mta.ca Plant Communities Sarah Robinson, Community Ecologist Tel: (506) 364-2664 <u>srobinson@mta.ca</u>

Billing Jean Breau Tel: (506) 364-2657 jrbreau@mta.ca

Questions on the biology of Federal Species at Risk can be directed to ACCDC: (506) 364-2658, with questions on Species at Risk regulations to: Samara Eaton, Canadian Wildlife Service (NB and PE): (506) 364-5060 or Julie McKnight, Canadian Wildlife Service (NS): (902) 426-4196.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in New Brunswick, please contact Stewart Lusk, Natural Resources: (506) 453-7110.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in Nova Scotia, please contact Sherman Boates, NSDNR: (902) 679-6146. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NSDNR Regional Biologist:

Western: Duncan Bayne (902) 648-3536 Duncan.Bayne@novascotia.ca

Eastern: Lisa Doucette (902) 863-7523 Lisa.Doucette@novascotia.ca Western: Jason Power (902) 634-7555 Ja<u>son.Power@novascotia.ca</u> Central: Shavonne Meyer (902) 893-6353 Shavonne.Meyer@novascotia.ca Central: Kimberly George (902) 893-5630 Kimberly.George@novascotia.ca

Eastern: Terry Power (902) 563-3370 <u>Terrance.Power@novascotia.ca</u>

For provincial information about rare taxa and protected areas, or information about game animals, fish habitat etc., in Prince Edward Island, please contact Garry Gregory, PEI Dept. of Communities, Land and Environment: (902) 569-7595.

# 2.0 RARE AND ENDANGERED SPECIES

#### 2.1 FLORA

The study area contains 6 records of 4 vascular, no records of nonvascular flora (Map 2 and attached: \*ob.xls).

#### 2.2 FAUNA

The study area contains 59 records of 22 vertebrate, no records of invertebrate fauna (Map 2 and attached data files - see 1.1 Data List). Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

Map 2: Known observations of rare and/or protected flora and fauna within the study area.



# **3.0 SPECIAL AREAS**

#### **3.1 MANAGED AREAS**

The GIS scan identified no managed areas in the vicinity of the study area (Map 3).

#### **3.2 SIGNIFICANT AREAS**

The GIS scan identified 1 biologically significant site in the vicinity of the study area (Map 3 and attached file: \*sa\*.xls).

Map 3: Boundaries and/or locations of known Managed and Significant Areas within the study area.





# **4.0 RARE SPECIES LISTS**

Rare and/or endangered taxa (excluding "location-sensitive" species, section 4.3) within the study area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation ( $\pm$  the precision, in km, of the record). [P] = vascular plant, [N] = nonvascular plant, [A] = vertebrate animal, [I] = invertebrate animal, [C] = community. Note: records are from attached files \*ob.xls/\*ob.shp only.

#### 4.1 FLORA

_	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
Ρ	Platanthera blephariglottis	White Fringed Orchid				S3	4 Secure	1	$2.2 \pm 0.0$
Ρ	Geocaulon lividum	Northern Comandra				S3S4	4 Secure	1	$1.4 \pm 0.0$
Ρ	Eriophorum russeolum	Russet Cottongrass				S3S4	4 Secure	2	$2.0 \pm 0.0$
Ρ	Potamogeton oakesianus	Oakes' Pondweed				S3S4	4 Secure	2	$4.5 \pm 0.0$
4.2	FAUNA								
	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
Α	Hirundo rustica	Barn Swallow	Threatened	Threatened	Threatened	S2B,S2M	3 Sensitive	5	1.9 ± 7.0
А	Chaetura pelagica	Chimney Swift	Threatened	Threatened	Threatened	S2S3B,S2M	1 At Risk	1	$4.3 \pm 0.0$
А	Riparia riparia	Bank Swallow	Threatened	Threatened		S2S3B,S2S3M	3 Sensitive	1	1.9 ± 7.0
А	Wilsonia canadensis	Canada Warbler	Threatened	Threatened	Threatened	S3B,S3M	1 At Risk	6	1.9 ± 7.0
А	Dolichonyx oryzivorus	Bobolink	Threatened	Threatened	Threatened	S3B,S3M	3 Sensitive	4	1.9 ± 7.0
А	Chordeiles minor	Common Nighthawk	Threatened	Threatened	Threatened	S3B,S4M	1 At Risk	4	1.1 ± 0.0
А	Contopus virens	Eastern Wood-Pewee	Special Concern	Special Concern	Special Concern	S4B,S4M	4 Secure	3	1.9 ± 7.0
А	Puma concolor pop. 1	Eastern Cougar	Data Deficient		Endangered	SNA	5 Undetermined	1	4.7 ± 1.0
А	Bartramia longicauda	Upland Sandpiper				S1B,S1M	3 Sensitive	1	1.9 ± 7.0
А	Progne subis	Purple Martin				S1B,S1M	2 May Be At Risk	2	1.9 ± 7.0
А	Petrochelidon pyrrhonota	Cliff Swallow				S2S3B,S2S3M	3 Sensitive	7	$0.9 \pm 0.0$
А	Carduelis pinus	Pine Siskin				S3	4 Secure	1	1.9 ± 7.0
А	Cathartes aura	Turkey Vulture				S3B,S3M	4 Secure	1	$4.9 \pm 0.0$
А	Rallus limicola	Virginia Rail				S3B,S3M	3 Sensitive	6	1.7 ± 0.0
А	Charadrius vociferus	Killdeer				S3B,S3M	3 Sensitive	2	1.9 ± 7.0
А	Coccyzus erythropthalmus	Black-billed Cuckoo				S3B,S3M	4 Secure	2	1.9 ± 7.0
А	Molothrus ater	Brown-headed Cowbird				S3B,S3M	2 May Be At Risk	2	1.9 ± 7.0
А	Dendroica tigrina	Cape May Warbler				S3B,S4S5M	4 Secure	1	1.9 ± 7.0
А	Anas acuta	Northern Pintail				S3B,S5M	3 Sensitive	1	1.9 ± 7.0
А	Tyrannus tyrannus	Eastern Kingbird				S3S4B,S3S4M	3 Sensitive	3	1.9 ± 0.0
А	Actitis macularius	Spotted Sandpiper				S3S4B,S5M	4 Secure	3	1.9 ± 7.0
Α	Gallinago delicata	Wilson's Snipe				S3S4B,S5M	4 Secure	2	1.9 ± 7.0

#### **4.3 LOCATION SENSITIVE SPECIES**

The Department of Natural Resources in each Maritimes province considers a number of species "location sensitive". Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in this report. Those intersecting your study area are indicated below with "YES".

#### **New Brunswick**

Scientific Name	Common Name	SARA	Prov Legal Prot	Known within the Study Site?
Chrysemys picta picta	Eastern Painted Turtle			No
Chelydra serpentina	Snapping Turtle	Special Concern	Special Concern	YES
Glyptemys insculpta	Wood Turtle	Threatened	Threatened	No
Haliaeetus leucocephalus	Bald Eagle		Endangered	YES
Falco peregrinus pop. 1	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Endangered	No
Cicindela marginipennis	Cobblestone Tiger Beetle	Endangered	Endangered	No
Coenonympha nipisiquit	Maritime Ringlet	Endangered	Endangered	No
Bat Hibernaculum		[Endangered] <sup>1</sup>	[Endangered] <sup>1</sup>	No

1 Myotis lucifugus (Little Brown Myotis), Myotis septentrionalis (Long-eared Myotis), and Perimyotis subflavus (Tri-colored Bat or Eastern Pipistrelle) are all Endangered under the Federal Species at Risk Act and the NB Species at Risk Act.

#### **4.4 SOURCE BIBLIOGRAPHY**

The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

#### # recs CITATION

- 37 Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
- 18 Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
- 6 Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2015. Atlantic Canada Conservation Data Centre Fieldwork 2015. Atlantic Canada Conservation Data Centre, # recs.
- 2 Hinds, H.R. 1986. Notes on New Brunswick plant collections. Connell Memorial Herbarium, unpubl, 739 recs.
- 1 eBird. 2014. eBird Basic Dataset. Version: EBD\_relNov-2014. Ithaca, New York. Nov 2014. Cornell Lab of Ornithology, 25036 recs.
- 1 Scott, Fred W. 1998. Updated Status Report on the Cougar (Puma Concolor couguar) [Eastern population]. Committee on the Status of Endangered Wildlife in Canada, 298 recs.
- 1 Tims, J. & Craig, N. 1995. Environmentally Significant Areas in New Brunswick (NBESA). NB Dept of Environment & Nature Trust of New Brunswick Inc.

# 5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 30624 records of 135 vertebrate and 662 records of 63 invertebrate fauna; 5230 records of 281 vascular, 766 records of 181 nonvascular flora (attached: \*ob100km.xls).

Taxa within 100 km of the study site that are rare and/or endangered in the province in which the study site occurs. All ranks correspond to the province in which the study site falls, even for out-of-province records. Taxa are listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation ( $\pm$  the precision, in km, of the record).

Taxonomic								#		
Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
A	Myotis lucifugus	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	15	16.1 ± 1.0	NB
A	Myotis septentrionalis	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	15	16.1 ± 1.0	NB
A	Perimyotis subflavus	Eastern Pipistrelle	Endangered	Endangered	Endangered	S1	1 At Risk	17	20.1 ± 0.0	NB
A	Sterna dougallii	Roseate Tern	Endangered	Endangered	Endangered	S1?B,S1?M	1 At Risk	1	94.1 ± 0.0	NS
А	Charadrius melodus melodus	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B,S1M	1 At Risk	1650	20.1 ± 0.0	NB
A	Dermochelys coriacea (Atlantic pop.)	Leatherback Sea Turtle - Atlantic pop.	Endangered	Endangered	Endangered	S1S2N	1 At Risk	5	38.7 ± 1.0	NB
A	Salmo salar pop. 1	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered	Endangered	S2	2 May Be At Risk	70	$24.8 \pm 0.0$	NB

Taxonomic								#		
Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
А	Calidris canutus rufa	Red Knot rufa ssp	Endangered		Endangered	S2M	1 At Risk	712	12.0 ± 44.0	NB
А	Rangifer tarandus pop.	Woodland Caribou (Atlantic-Gasp Lesie non.)	Endangered	Endangered	Extirnated	SX	0.1 Extirnated	2	383+10	NB
<i>/</i> (	2	Woodiand Oanbou (Maantie Oasp  * sie pop.)	Enddrigered	Endangered	Exilipated	UX		2	00.0 ± 1.0	
A	Sturnella magna	Eastern Meadowlark	Threatened	Threatened	Threatened	S1B,S1M	2 May Be At Risk	46	$20.3 \pm 0.0$	NB
A	Ixobrychus exilis	Least Bittern	Threatened	Threatened	Threatened	S1S2B,S1S2M	1 At Risk	14	$15.9 \pm 0.0$	NB
A	Hylocichla mustelina	Wood Thrush	Threatened	Threatened	Threatened	S1S2B,S1S2M	2 May Be At Risk	64	$13.0 \pm 2.0$	NB
A	Caprimulgus vociterus	Whip-Poor-Will	Threatened	Threatened	Threatened	S2B,S2M	1 At Risk	20	8.5 ± 7.0	NB
A	Hirundo rustica	Barn Swallow	Threatened	Threatened	Threatened	S2B,S2M	3 Sensitive	1160	$1.9 \pm 7.0$	NB
A	Catharus bicknelli	Bicknell's Thrush	Threatened	Special Concern	Threatened	S2B,S2M	1 At Risk	11	13.0 ± 2.0	NB
A	Glyptemys insculpta	Wood Turtle	Threatened	Ihreatened	Ihreatened	S2S3	1 At Risk	544	$6.2 \pm 0.0$	NB
A	Chaetura pelagica	Chimney Swift	Inreatened	Inreatened	Inreatened	S2S3B,S2M	1 At RISK	170	$4.3 \pm 0.0$	NB
A	Riparia riparia	Bank Swallow	I hreatened	Inreatened	There also and	S2S3B,S2S3M	3 Sensitive	698	$1.9 \pm 7.0$	NB
A		Atlantic Sturgeon	Threatened	Threatened	Threatened	53 630 63M	4 Secure	3	$30.4 \pm 1.0$	NB ND
A	Wilcomic cooperi	Olive-sided Flycalcher	Threatened	Threatened	Threatened	530,531VI	1 AL RISK	4/5	$5.4 \pm 0.0$	
A			Threatened	Threatened	Threatened	530,531VI	1 AL KISK	200	$1.9 \pm 7.0$	
A	Chardailaa minar	BODUIIIK Common Nighthousk	Threatened	Threatened	Threatened	535,531VI	3 Sensitive	107	$1.9 \pm 7.0$	
A	Anguillo rostrato	American Fel	Threatened	Inreatened	Threatened	536,54IVI	1 AL RISK	197	$1.1 \pm 0.0$	
A	Anguilla Tostrata	American Eer	Inteateneu		Inrealeneu	34	4 Secure	10	10.9 ± 1.0	
A	noveboracensis	Yellow Rail	Special Concern	Special Concern	Special Concern	S1?B,SUM	2 May Be At Risk	5	27.7 ± 0.0	IND
А	Falco peregrinus pop. 1	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Endangered	S1B,S3M	1 At Risk	312	8.5 ± 7.0	NB
A	Asio flammeus	Short-eared Owl	Special Concern	Special Concern	Special Concern	S2B,S2M	3 Sensitive	43	5.7 ± 64.0	NB
A	Bucephala islandica (Eastern pop.)	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern	Special Concern	S2M,S2N	3 Sensitive	105	11.9 ± 119.0	NB
A	Balaenoptera physalus	Fin Whale - Atlantic pop.	Special Concern	Special Concern	Special Concern	S2S3		1	52.7 ± 1.0	NB
A	Chelydra serpentina	Snapping Turtle	Special Concern	Special Concern	Special Concern	S3	3 Sensitive	2	3.7 ± 1.0	NB
A	Euphagus carolinus	Rusty Blackbird	Special Concern	Special Concern	Special Concern	S3B,S3M	2 May Be At Risk	87	15.4 ± 0.0	NB
A	Coccothraustes vespertinus	Evening Grosbeak	Special Concern			S3B,S3S4N,SUM	3 Sensitive	242	8.5 ± 7.0	NB
A	Phalaropus lobatus	Red-necked Phalarope	Special Concern			S3M	3 Sensitive	18	$9.9 \pm 0.0$	NB
A	Contopus virens	Eastern Wood-Pewee	Special Concern	Special Concern	Special Concern	S4B,S4M	4 Secure	601	1.9 ± 7.0	NB
A	Podiceps auritus	Horned Grebe	Special Concern		Special Concern	S4N,S4M	4 Secure	50	19.9 ± 5.0	NB
A	Hemidactylium scutatum	Four-toed Salamander	Not At Risk			S1?	5 Undetermined	4	66.4 ± 0.0	NB
A	Bubo scandiacus	Snowy Owl	Not At Risk			S1N,S2S3M	4 Secure	50	$9.5 \pm 0.0$	NB
A	Accipiter cooperii	Cooper's Hawk	Not At Risk			S1S2B,S1S2M	2 May Be At Risk	4	28.2 ± 5.0	NB
A	Fulica americana	American Coot	Not At Risk			S1S2B,S1S2M	3 Sensitive	56	$16.3 \pm 0.0$	NB
A	Aegolius funereus	Boreal Owl	Not At Risk			S1S2B,SUM	2 May Be At Risk	10	$28.0 \pm 0.0$	NB
A	Sorex dispar	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	6	32.5 ± 1.0	NB
A	Buteo lineatus	Red-shouldered Hawk	Not At Risk	Special Concern		S2B,S2M	2 May Be At Risk	22	15.4 ± 0.0	NB
A	Chlidonias niger	Black Tern	Not At Risk			S2B,S2M	3 Sensitive	62	18.5 ± 7.0	NB
A	Lynx canadensis	Canadian Lynx	Not At Risk		Endangered	S3	1 At Risk	13	22.6 ± 10.0	NB
A	Desmognathus fuscus	Northern Dusky Salamander	Not At Risk			S3	3 Sensitive	1	$61.2 \pm 0.0$	NB
A	Sterna hirundo	Common Tern	Not At Risk			S3B,SUM	3 Sensitive	585	11.3 ± 1.0	NB
A	Podiceps grisegena	Red-necked Grebe	Not At Risk			S3M,S2N	3 Sensitive	50	20.1 ± 1.0	NB
A	Lagenorhynchus acutus	Atlantic White-sided Dolphin	Not At Risk			S3S4		2	26.2 ± 1.0	NB
А	Haliaeetus leucocephalus	Bald Eagle	Not At Risk		Endangered	S4	1 At Risk	1103	1.9 ± 7.0	NB
A	Canis lupus	Gray Wolf	Not At Risk		Extirpated	SX	0.1 Extirpated	2	78.1 ± 1.0	NB
A	Puma concolor pop. 1	Eastern Cougar	Data Deficient		Endangered	SNA	5 Undetermined	117	4.7 ± 1.0	NB
A	Morone saxatilis	Striped Bass	E,E,SC			S3	2 May Be At Risk	39	$30.4 \pm 0.0$	NB
A	Salvelinus alpinus	Arctic Char				S1	3 Sensitive	3	73.6 ± 1.0	NB
A	Vireo flavifrons	Yellow-throated Vireo				S1?B,S1?M	8 Accidental	4	13.8 ± 0.0	NB
A	Tringa melanoleuca	Greater Yellowlegs				S1?B,S5M	4 Secure	1924	$7.2 \pm 0.0$	NB
A	Aythya americana	Redhead				S1B,S1M	8 Accidental	10	9.1 ± 7.0	NB

	Taxonomic								#		
	Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
_	A	Gallinula chloropus	Common Moorhen			v	S1B S1M	3 Sensitive	30	178+00	NB
	Δ	Grus canadensis	Sandhill Crane				S1B S1M	8 Accidental	11	$240 \pm 70$	NB
	Δ	Bartramia longicauda	Lipland Sandniner				S1B S1M	3 Sensitive	10	10+70	NB
	Δ	Phalaronus tricolor	Wilson's Phalarone				S1B S1M	3 Sonsitivo	43 27	00+00	NB
	^	Laucanhagua atricilla					S1D,S1M	2 Sonoitivo	21	$3.3 \pm 0.0$	ND
	A	Drogno oubio	Laughing Guil					3 Serisitive	9	$10.0 \pm 1.0$	
	A	Progne subis	Purple Martin				51B,51M	Z May Be At RISK	109	$1.9 \pm 7.0$	NB
	A	Inryothorus	Carolina Wren				S1B.S1M	8 Accidental	7	13.0 ± 5.0	NB
		ludovicianus							-		
	A	Oxyura jamaicensis	Ruddy Duck				S1B,S2S3M	4 Secure	103	9.1 ± 7.0	NB
	A	Aythya affinis	Lesser Scaup				S1B,S4M	4 Secure	165	11.9 ± 0.0	NB
	A	Aythya marila	Greater Scaup				S1B,S4M,S2N	4 Secure	10	20.9 ± 1.0	NB
	A	Eremophila alpestris	Horned Lark				S1B,S4N,S5M	2 May Be At Risk	63	8.5 ± 7.0	NB
	A	Sterna paradisaea	Arctic Tern				S1B,SUM	2 May Be At Risk	24	21.1 ± 7.0	NB
	A	Fratercula arctica	Atlantic Puffin				S1B,SUN,SUM	3 Sensitive	3	59.5 ± 11.0	NB
	A	Branta bernicla	Brant				S1N, S2S3M	4 Secure	34	20.1 ± 1.0	NB
	•	Chroicocephalus					0.00	0.0	40	10.0.00	NB
	A	ridibundus	Black-headed Gull				S1N,S2M	3 Sensitive	12	$10.9 \pm 0.0$	
	Α	Butorides virescens	Green Heron				S1S2B S1S2M	3 Sensitive	5	185+70	NB
	Δ	Nycticorax nycticorax	Black-crowned Night-heron				S1S2B S1S2M	3 Sensitive	5	$15.0 \pm 1.0$ $15.4 \pm 0.0$	NB
	Δ	Empidonav traillii	Willow Elycatcher				S1S2B S1S2M	3 Sensitive	64	85+70	NB
	~	Stolaidontony	Willow Hybatcher				01020,01021	o ocholive	04	0.0 ± 7.0	NS
	A	sorripoppie	Northern Rough-winged Swallow				S1S2B,S1S2M	2 May Be At Risk	4	61.6 ± 0.0	NO
	^	Tradadutas asdan					C4COD C4COM	E Un determined	4.4	66.00	
	A	Disas tridestato	House with				5152B,5152W	5 Undetermined		$0.0 \pm 0.0$	ND
	A	Rissa tridactyla	Black-legged Kittiwake				S1S2B,S4N,S5M	4 Secure	2	$37.2 \pm 0.0$	NB
	A	Calidris bairdii	Baird's Sandpiper				S1S2M	3 Sensitive	47	$9.9 \pm 0.0$	NB
	A	Cistothorus palustris	Marsh Wren				S2B,S2M	3 Sensitive	43	$15.9 \pm 0.0$	NB
	A	Mimus polyglottos	Northern Mockingbird				S2B,S2M	3 Sensitive	133	8.5 ± 7.0	NB
	A	Toxostoma rufum	Brown Thrasher				S2B,S2M	3 Sensitive	27	11.6 ± 7.0	NB
	A	Pooecetes gramineus	Vesper Sparrow				S2B,S2M	2 May Be At Risk	112	8.5 ± 7.0	NB
	A	Anas strepera	Gadwall				S2B,S3M	4 Secure	230	8.5 ± 7.0	NB
	•	Distante envelopter	Dine Orecheel				S2B,S4S5N,S4S	0.0	00	0.0.70	NB
	A	Pinicola enucleator	Pine Grosbeak				5M	3 Sensitive	29	$9.0 \pm 7.0$	
	Α	Tringa solitaria	Solitary Sandpiper				S2B.S5M	4 Secure	149	$9.7 \pm 0.0$	NB
		Oceanodroma	· · · · · · · · · · ·								NB
	A	leucorhoa	Leach's Storm-Petrel				S2B,SUM	3 Sensitive	1	$25.5 \pm 0.0$	
	Δ	Chen caerulescens	Show Goose				S2M	4 Secure	22	74+00	NB
	Δ	Phalacrocoray carbo	Great Cormorant				S2N S2M		20	$122 \pm 20$	NB
	^	Somateria spectabilis	King Eider				S2N S2M	4 Secure	23	$12.2 \pm 2.0$	NB
	A 						SZIN, SZIVI	4 Secure	4	20.1 ± 0.0	
	A	Larus Tiyperboreus					52IN,52IVI	4 Secure	92	$7.8 \pm 59.0$	
	A	ASIO OLUS	Long-eared Owi				5253		21	$7.1 \pm 0.0$	
	A	Picoides dorsalis	American Three-toed woodpecker				5253	3 Sensitive	14	$38.5 \pm 7.0$	NB
	A	Salmo salar	Atlantic Salmon				\$2\$3	2 May Be At Risk	35	$16.9 \pm 1.0$	NB
	A	Anas clypeata	Northern Shoveler				S2S3B,S2S3M	4 Secure	302	$6.5 \pm 0.0$	NB
	A	Myiarchus crinitus	Great Crested Flycatcher				S2S3B,S2S3M	3 Sensitive	45	8.5 ± 7.0	NB
	٨	Petrochelidon	Cliff Swallow				6262B 6263M	2 Soncitivo	102	00+00	NB
	A	pyrrhonota	Cilli Swallow				5255D,52551VI	3 Sensitive	492	$0.9 \pm 0.0$	
	Α	Pluvialis dominica	American Golden-Plover				S2S3M	3 Sensitive	198	$12.0 \pm 0.0$	NB
	Α	Calcarius lapponicus	Lapland Longspur				S2S3N.SUM	3 Sensitive	42	15.4 ± 0.0	NB
	Α	Cepphus arvlle	Black Guillemot				S3	4 Secure	44	$38.5 \pm 5.0$	NB
	А	Loxia curvirostra	Red Crossbill				S3	4 Secure	122	$8.5 \pm 7.0$	NB
	A	Carduelis pinus	Pine Siskin				S3	4 Secure	319	19+70	NB
	Δ	Sorey maritimensis	Maritime Shrew				S3	4 Secure	1/1	316+10	NB
	^	Entesious fuscus	Rig Brown Bot				62	2 Sonsitivo	7	116+10	
	^	Cothorton ouro	Turkov Vulturo				00 600 60M		125	11.0 ± 1.0	
	~	Califarites aulta					SOD, SOIVI	4 Secure	130	4.9 ± 0.0	
	A	railus limicola	virginia Kall				23B,23IVI	3 Sensitive	141	$1.7 \pm 0.0$	NB
	A	Charadrius vociterus	Killdeer				S3B,S3M	3 Sensitive	855	$1.9 \pm 1.0$	NB
	A	ı rınga semıpalmata	Willet				S3B,S3M	3 Sensitive	814	16.0 ± 7.0	NB

	Taxonomic								#		
_	Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
	A	Coccyzus en/thropthalmus	Black-billed Cuckoo				S3B,S3M	4 Secure	96	1.9 ± 7.0	NB
	٨	Viroo ailuus	Warbling Viroo				63B 63M	4 Socuro	54	85+70	NID
	^	Piranga olivação	Scarlot Tanagor				53B,53M	4 Secure	46	$0.5 \pm 7.0$	NB
	^	Passorina ovanoa	Indiao Runting				S3D,33M	4 Secure	40	$0.3 \pm 7.0$	NB
	^	Molothrup otor	Prover booded Cowbird				53D,53W	4 Secure 2 Mov Po At Biok	2/2	19.1 ± 7.0	
	A		Biown-neaded Cowbird				53D,53IVI		243	$1.9 \pm 7.0$	
	A	Icterus galbula	Baltimore Oriole				S3B,S3IVI	4 Secure	80	8.5 ± 7.0	NB
	A	Somateria mollissima					S3B,S4M,S3N	4 Secure	179	$6.3 \pm 80.0$	NB
	A	Dendroica tigrina	Cape May warbler				S3B,S4S5M	4 Secure	238	$1.9 \pm 7.0$	NB
	A	Anas acuta	Northern Pintall				S3B,S5M	3 Sensitive	136	$1.9 \pm 7.0$	NB
	A	Mergus serrator	Red-breasted Merganser				S3B,S5M,S4S5N	4 Secure	280	$15.0 \pm 1.0$	NB
	A	Arenaria interpres	Ruddy Turnstone				S3M	4 Secure	1022	$9.5 \pm 0.0$	NB
	A	Phalaropus fulicarius	Red Phalarope				S3M	3 Sensitive	4	$39.3 \pm 0.0$	NB
	A	Melanitta nigra	Black Scoter				S3M,S1S2N	3 Sensitive	243	$5.7 \pm 64.0$	NB
	A	Bucephala albeola	Bufflenead				S3M,S2N	3 Sensitive	106	$5.7 \pm 64.0$	NB
	A	Calidris maritima	Purple Sandpiper				S3M,S3N	4 Secure	65	$20.9 \pm 1.0$	NB
	A	Synaptomys cooperi	Southern Bog Lemming				S3S4	4 Secure	88	39.0 ± 1.0	NB
	A	Tyrannus tyrannus	Eastern Kingbird				S3S4B,S3S4M	3 Sensitive	473	1.9 ± 7.0	NB
	A	Actitis macularius	Spotted Sandpiper				S3S4B,S5M	4 Secure	826	1.9 ± 7.0	NB
	A	Gallinago delicata					S3S4B,S5M	4 Secure	//5	$1.9 \pm 7.0$	NB
	A	Larus delawarensis	Ring-billed Gull				S3S4B,S5M	4 Secure	265	$9.7 \pm 0.0$	NB
	A	Dendroica striata					5354B,55M	4 Secure	53	$12.3 \pm 7.0$	NB
	A	Pluvialis squatarola	Black-bellied Plover				S3S4M	4 Secure	1/4/	$9.9 \pm 0.0$	NB
	A	Limosa naemastica					S3S4M	4 Secure	407	$21.3 \pm 0.0$	NB
	A	Calidris pusilia	Semipalmated Sandpiper				S3S4M	4 Secure	2394	$9.5 \pm 0.0$	NB
	A	Calidris melanotos	Pectoral Sandpiper				S3S4M	4 Secure	373	9.2 ± 1.0	NB
	A	Calidris alba	Sanderling				S3S4M,S1N	3 Sensitive	1549	$19.2 \pm 0.0$	NB
	A	Morus bassanus	Northern Gannet				SHB,S5M	4 Secure	168	$12.0 \pm 44.0$	NB
	A	Lanius Iudovicianus	Loggernead Shrike				SXB,SXM	1 At RISK	1	$15.4 \pm 0.0$	NB
	1	Gompnus ventricosus	Skillet Clubtail	Endangered	0 10	Endangered	S1S2	2 May Be At Risk	2	$69.7 \pm 0.0$	NB
	1	Danaus piexippus	Monarch	Endangered	Special Concern	Special Concern	S3B,S3M	3 Sensitive	76	$7.3 \pm 0.0$	NB
	1	Opniogompnus nowei	Pygmy Snaketail	Special Concern	Special Concern	Special Concern	S2	2 May Be At Risk	1	95.2 ± 0.0	NB
	1	Alasmidonta varicosa	Brook Floater	Special Concern	<b>a</b> a	Special Concern	52	3 Sensitive	34	$21.8 \pm 1.0$	NB
	1	Lampsilis cariosa		Special Concern	Special Concern	Special Concern	S2	3 Sensitive	21	79.6 ± 0.0	NB
	1	Bombus terricola	Yellow-banded Bumblebee	Special Concern			\$3?	3 Sensitive	10	$28.0 \pm 0.0$	NB
	1	Appalachina sayana	Spike-lip Crater	NOT AT RISK			\$3?		1	96.9 ± 1.0	NB
	1	Erora laeta	Early Hairstreak				51	2 May Be At Risk	1	$19.0 \pm 1.0$	NB
	1	Leucorminia patricia	Canada whiteface				51	2 May Be At Risk	1	83.8 ± 1.0	NB
	1	Piebėjus saepiolus	Greenish Blue				S1S2	4 Secure	2	39.5 ± 7.0	NB
	I	Strymon melinus	Grey Hairstreak				S2	4 Secure	1	$30.2 \pm 1.0$	NB
	I	Somatochlora brevicincta	Quebec Emerald				S2	5 Undetermined	2	$30.4 \pm 0.0$	NB
	I	Somatochlora tenebrosa	Clamp-Tipped Emerald				S2	5 Undetermined	6	22.1 ± 1.0	NB
	I	Ladona exusta	White Corporal				S2	5 Undetermined	2	70.5 ± 0.0	NB
	I	Coenagrion interrogatum	Subarctic Bluet				S2	3 Sensitive	3	93.4 ± 1.0	NB
	I	Callophrvs henrici	Henry's Elfin				S2S3	4 Secure	8	$18.4 \pm 0.0$	NB
	I	Flaphrus americanus	a Ground Beetle				S3	4 Secure	1	$425 \pm 0.0$	NB
	Ì	Agonum crenistriatum	a Ground Beetle				S3	5 Undetermined	1	$10.8 \pm 1.0$	NB
	i	Agonum consimile	a Ground Beetle				S3	4 Secure	1	$10.8 \pm 1.0$ $10.8 \pm 1.0$	NB
	Ì	Lachnocrepis parallela	a Ground Beetle				S3	4 Secure	1	$38.5 \pm 0.0$	NB
	i	Dvschirius setosus	a Ground Beetle				S3	5 Undetermined	3	$38.5 \pm 0.0$	NB
	I	Harpalus fulvilabris	a Ground Beetle				S3	4 Secure	1	$41.9 \pm 0.0$	NB
	I	Amara pallipes	a Ground Beetle				S3	4 Secure	2	$10.8 \pm 1.0$	NB
	L	Carabus maeander	a Ground Beetle				S3	5 Undetermined	1	$10.8 \pm 1.0$	NB
	L	Carabus serratus	a Ground Beetle				S3	4 Secure	1	13.3 ± 1.0	NB

Taxonomic								#		
Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
I	Hippodamia parenthesis	Parenthesis Lady Beetle				S3	4 Secure	7	10.8 ± 1.0	NB
1	Xvlotrechus undulatus	a Longhorned Beetle				S3		1	$9.9 \pm 1.0$	NB
1	Calathus gregarius	a Ground Beetle				S3	4 Secure	1	60.1 ± 1.0	NB
i	Gonioctena americana	a Leaf Beetle				S3		1	$39.3 \pm 0.0$	NB
1	Trachvsida aspera	a Longhorned Beetle				S3		1	$47.6 \pm 0.0$	NB
i	Hesperia sassacus	Indian Skipper				S3	4 Secure	2	$82.0 \pm 5.0$	NB
i	Euphves bimacula	Two-spotted Skipper				S3	4 Secure	6	$11.5 \pm 1.0$	NB
1	Papilio brevicauda	Short-tailed Swallowtail				S3	4 Secure	6	$50.0 \pm 0.0$	NB
I	Papilio brevicauda bretonensis	Short-tailed Swallowtail				S3	4 Secure	5	$22.5 \pm 0.0$	NB
I	Lycaena hyllus	Bronze Copper				S3	3 Sensitive	77	8.5 ± 5.0	NB
I	Lycaena dospassosi	Salt Marsh Copper				S3	4 Secure	91	$20.6 \pm 0.0$	NB
I	Satyrium acadica	Acadian Hairstreak				S3	4 Secure	20	8.5 ± 5.0	NB
1	Callophrys polios	Hoary Elfin				S3	4 Secure	6	19.5 ± 0.0	NB
1	Plebėjus idas	Northern Blue				S3	4 Secure	18	31.2 ± 7.0	NB
1	Plebejus idas empetri	Crowberry Blue				S3	4 Secure	1	$50.3 \pm 0.0$	NB
I	Speyeria aphrodite	Aphrodite Fritillary				S3	4 Secure	8	12.9 ± 0.0	NB
I	Boloria chariclea	Arctic Fritillary				S3	4 Secure	11	21.8 ± 1.0	NB
1	Polygonia satyrus	Satyr Comma				S3	4 Secure	1	97.2 ± 0.0	NB
I	Polygonia gracilis	Hoary Comma				S3	4 Secure	1	81.0 ± 0.0	NB
1	Nymphalis I-album	Compton Tortoiseshell				S3	4 Secure	6	13.5 ± 10.0	NB
I	Gomphus abbreviatus	Spine-crowned Clubtail				S3	4 Secure	7	85.5 ± 0.0	NB
1	Dorocordulia lepida	Petite Emerald				S3	4 Secure	6	55.9 ± 1.0	NB
I	Somatochlora cingulata	Lake Emerald				S3	4 Secure	3	56.9 ± 1.0	NB
I	Somatochlora forcipata	Forcipate Emerald				S3	4 Secure	5	38.0 ± 0.0	NB
I	Williamsonia fletcheri	Ebony Boghaunter				S3	4 Secure	16	12.3 ± 2.0	NB
I	Lestes eurinus	Amber-Winged Spreadwing				S3	4 Secure	17	30.2 ± 1.0	NB
I	Lestes vigilax	Swamp Spreadwing				S3	3 Sensitive	1	94.4 ± 0.0	NS
I	Enallagma geminatum	Skimming Bluet				S3	5 Undetermined	4	96.0 ± 0.0	NB
1	Enallagma signatum	Orange Bluet				S3	4 Secure	2	86.5 ± 0.0	NS
I	Stylurus scudderi	Zebra Clubtail				S3	4 Secure	9	12.8 ± 0.0	NB
1	Alasmidonta undulata	Triangle Floater				S3	3 Sensitive	46	30.3 ± 1.0	NB
I	Leptodea ochracea	Tidewater Mucket				S3	4 Secure	28	26.4 ± 1.0	NB
1	Neohelix albolabris	Whitelip				S3		1	96.9 ± 0.0	NB
1	Pantala hymenaea	Spot-Winged Glider				S3B,S3M	4 Secure	3	26.6 ± 0.0	NB
1	Satyrium liparops	Striped Hairstreak				S3S4	4 Secure	16	$7.3 \pm 0.0$	NB
I	Satyrium liparops strigosum	Striped Hairstreak				S3S4	4 Secure	11	12.8 ± 0.0	NB
I	Cupido comyntas Coccinella	Eastern Tailed Blue				S3S4	4 Secure	1	$38.2 \pm 0.0$	NB NB
I	transversoguttata richardsoni	Transverse Lady Beetle				SH	2 May Be At Risk	27	9.9 ± 1.0	
Ν	Erioderma mollissimum Erioderma	Graceful Felt Lichen	Endangered		Endangered	SH	2 May Be At Risk	1	68.5 ± 1.0	NB
Ν	pedicellatum (Atlantic	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	SH	1 At Risk	2	80.2 ± 0.0	NO
N	Polticera hydrothyria	Eastern Waterfan	Threatened			S1	5 Undetermined	6	601+00	NB
N	Anzia colnodes	Black-foam Lichen	Threatened			S1S2	5 Undetermined	2	$50.1 \pm 0.0$	NB
N	Negelia nlumbea	Blue Felt Lichen	Special Concorn	Special Concern	Special Concorn	S102	2 May Bo At Rick	2	80.1 ± 0.0	NS
N	Pseudevernia cladonia	Chost Antler Lichen	Not At Rick	opecial concern	Special Concern	5253	5 Undetermined	2 6	50.1 ± 0.0	NB
N	Aloina rigida	Aloe-Like Rigid Screw Moss	NUL AL INISK			S1	2 May Be At Rick	2	$37.5 \pm 0.0$	NB
	Aulacomnium	Aloc Like Algid Oolew 10055					2 May DE ALINISK	4	51.0 ± 0.0	NB
Ν	heterostichum	One-sided Groove Moss				S1	2 May Be At Risk	2	88.0 ± 0.0	NR
N	saxicola	a Moss				S1	2 May Be At Risk	1	$90.4 \pm 0.0$	IND

Taxonomic								#		
Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
N.	Dicranoweisia crispula	Mountain Thatch Moss				S1	2 May Be At Risk	1	58.6 ± 0.0	NB
	Didymodon riaidulus									NB
N	var gracilis	a moss				S1	2 May Be At Risk	1	66.1 ± 1.0	
N	Svntrichia ruralis	a Moss				S1	2 May Be At Risk	1	755+00	NB
	Zvaodon viridissimus					01	2 May Do At Ron	•	10.0 ± 0.0	NB
N	var viridissimus	a Moss				S1	2 May Be At Risk	1	89.2 ± 0.0	NB
N	Collema tenay	Soil Tarpaper Lichen				S1		1	$718 \pm 0.0$	DE
	Cladonia					01			74.0 ± 0.0	NB
N	metacorallifera	Reptilian Pixie-cup Lichen				S1	5 Undetermined	5	52.4 ± 1.0	ND
N	Coccocarnia nalmicola	Salted Shell Lichen				<b>Q1</b>	2 May Bo At Pick	1	$52.4 \pm 1.0$	NB
N	Poltigora malacoa	Voinloop Dolt Lichon				S1	Z Ividy De Al Kisk	1	$52.4 \pm 1.0$	
N	Revoria bicolor	Floatrified Hereobair Lieben				S1	2 May Bo At Bick	1	$05.0 \pm 1.0$	
IN N	Bryona bicoloi Hygrobiollo lovifolio					S1 612	2 IVIAY DE AL RISK	1	$65.0 \pm 1.0$	
IN N		Las Notchwort				01? 010	0 NOLASSESSEU	1	$00.4 \pm 1.0$	ND
IN N	Attrictium angustatum	Cesser Smoothcap Moss				S1?	2 IVIAY DE AL RISK	1	$90.4 \pm 5.0$	IN S
IN N	Bartramia itnypnylia	Straight-leaved Apple Moss				51?	2 May Be At Risk	2	59.5 ± 1.0	NB
IN	Dicranum bonjeanii	Bonjean's Broom Moss				51?	2 May Be At RISK	1	$94.4 \pm 0.0$	NS
Ν	Dicranum	Condensed Broom Moss				S1?	2 May Be At Risk	1	58.7 ± 0.0	NB
	condensatum					040			70 7 40 0	
N	Entodon brevisetus	a Moss				S1?	2 May Be At Risk	1	$70.7 \pm 10.0$	NB
N	Eurhynchium hians	Light Beaked Moss				S1?	2 May Be At Risk	1	$77.9 \pm 0.0$	NB
N	Homomallium adnatum	Adnate Hairy-gray Moss				S1?	2 May Be At Risk	4	$47.4 \pm 1.0$	NB
N	Plagiothecium	Alder Silk Moss				S1?	2 May Be At Risk	2	$65.3 \pm 1.0$	NB
	latebricola					<b>0</b>		_		
N	Rhytidium rugosum	Wrinkle-leaved Moss				S1?	2 May Be At Risk	2	66.0 ± 1.0	NB
N	Seligeria recurvata	a Moss				S1?	2 May Be At Risk	3	43.5 ± 15.0	NB
N	l immia megapolitana	Metropolitan Timmia Moss				S1?	2 May Be At Risk	2	87.7 ± 1.0	NS
Ν	Rnizomnium	Felted Leafy Moss				S1?	2 May Be At Risk	1	86.0 ± 0.0	NB
	pseudopunctatum					0400		•		
N		Spiny Inreadwort				S1S2	6 Not Assessed	2	$66.9 \pm 0.0$	NB
N N		Holt's Notchwort				5152	6 Not Assessed	4	$50.0 \pm 0.0$	NB
IN N	Harpantnus flotovianus	Great Mountain Flapwort				5152	6 NOT Assessed	2	53.2 ± 1.0	NB
IN	Jungermannia obovata	Egg Flapwort				5152	6 NOT ASSESSED	1	$60.6 \pm 0.0$	NB
N	onborni	Bog-Moss Flapwort				S1S2	6 Not Assessed	1	97.4 ± 0.0	NB
N	spriagrii Bollovioinio Ivollii	Luella Bibbonuert				0400		4	707.10	
IN N		Lyell's Ribbonwon				5152	6 Not Assessed	1	$70.7 \pm 1.0$	
IN	Radula lenax	Terracious Scalewort				3132	0 NULASSESSEU	I	$00.0 \pm 0.0$	
N	Brachythechum	Acuminate Ragged Moss				S1S2	5 Undetermined	2	61.5 ± 2.0	IND
N	Brum oplinum	a Maaa				6160	2 Mov Po At Biok	4	65 2 . 1 0	ND
IN N	Distichium inclinatum	a Moss				010Z 0102	2 May De Al RISK	5	$05.5 \pm 1.0$	
N	Distriction pollidum	Role Cow bair Mass				S132 S152	2 May De At Risk	1	$67.1 \pm 1.0$	
IN	Drummondia	Fale Cow-Hall Moss				3132	Z May DE AL RISK	1	07.1 ± 1.0	
N	prorepens	a Moss				S1S2	2 May Be At Risk	1	$90.4 \pm 0.0$	ND
N	Hvarobypnum bestii	Best's Brook Moss				\$1\$2	3 Sonsitivo	5	$58.4 \pm 1.0$	NB
N	Soligoria brovifolia	a Moss				S152 S1S2	3 Sonsitivo	1	$30.4 \pm 1.0$	NB
N	Timmia nonvegica					S152 S1S2	2 May Bo At Dick	2	$66.3 \pm 0.0$	NB
IN	Timmia norvegica var	a 11055				3132	2 May De Al NISK	5	$00.3 \pm 0.0$	NB
N		a moss				S1S2	2 May Be At Risk	1	$66.3 \pm 0.0$	ND
N	Tortella humilis	Small Crisp Moss				\$1\$2	2 May Bo At Rick	7	$60.8 \pm 1.0$	NB
IN IN	Psoudotavinhullum	Sinai Chisp Woss				0102	2 May De At Misk	1	00.0 ± 1.0	NB
N	distichaceum	a Moss				S1S2	2 May Be At Risk	1	14.4 ± 1.0	
N	l Imbilicaria vellea	Grizzled Rocktrine Lichen				\$1\$2	5 Undetermined	1	657+10	NB
N	Poltigera scobroso	Greater Toad Pelt Lichen				S1S2	2 May Re At Rick	1	$50.7 \pm 1.0$ $50.8 \pm 1.0$	NB
N	Tritomaria scitula	Mountain Notchwort				S1S3	6 Not Assessed	1	$56.0 \pm 1.0$	NB
N	Amphidium mourgeotii	a Moss				\$2	3 Sensitive	11	$50.7 \pm 1.0$ 56.2 ± 0.0	NB
N	Anomodon vitioulosus	a Moss				S2	2 May Bo At Diek	2	$50.2 \pm 0.0$	NB
N	Cirrinbyllum piliforum	a woss Hair pointed Moss				52 62	2 May DE AL KISK	1	$33.3 \pm 10.0$	ND
IN	Cimpnyiium piliterum					52	3 Genslive	4	$47.5 \pm 1.0$	IND

	Taxonomic								#		
	Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
_	N	Dicranella nalustris	Drooping-Leaved Fork Moss		-	3	S2	3 Sensitive	7	$532 \pm 10$	NB
	N	Didumodon forruginouo	a moss				62	2 Sonoitivo	1	65.2 ± 1.0	ND
	IN NI	Anomodon triatio					52		1	$03.0 \pm 0.0$	
	N	Anomodon unsus	a Moss				52	2 May Be At Risk	9	60.0 ± 10.0	NB
	N	Hypnum pratense	Meadow Plait Moss				S2	3 Sensitive	1	$79.5 \pm 0.0$	PE
	N	Isopterygiopsis	Next Silk Moss				60	2 Sonsitivo	7	$573 \pm 10$	NB
	IN .	pulchella	Neal SIK WOSS				32	3 Sensitive	'	$57.5 \pm 1.0$	
		Platydictya					00	0.0		40 5 45 0	NB
	N	iungermannioides	Faise Willow Moss				S2	3 Sensitive	4	$43.5 \pm 15.0$	
	N	Pohlia elongata	Long-necked Nodding Moss				S2	3 Sensitive	14	$590 \pm 00$	NB
	N	Poblia sphagnicola					62	2 Sonoitivo	1	00.0 ± 0.0	ND
	IN NI		a moss				32		1	$64.5 \pm 0.0$	
	IN .	Seligeria calcarea					52	3 Sensitive	2	$53.2 \pm 0.0$	IND
	N	Sphagnum centrale	Central Peat Moss				S2	3 Sensitive	8	53.7 ± 1.0	NB
	N	Sphagnum flexuosum	Flexuous Peatmoss				S2	3 Sensitive	3	56.8 ± 0.0	NB
	N	Tayloria serrata	Serrate Trumpet Moss				S2	3 Sensitive	7	36.0 ± 100.0	NB
	NI	Tetrodontium	Little Oceanie				00	0. On a shift on	40	50.0.00	NB
	N	brownianum	Little Georgia				S2	3 Sensitive	12	$58.6 \pm 0.0$	
		Thampohnum									NB
	N	alloghanionso	a Moss				S2	3 Sensitive	14	31.1 ± 1.0	ne -
	NI		Mueronata Caray Masa				60	2 Consitive	4	000.00	NC
	IN .	Tortula mucromiolia	Mucronate Screw Moss				52	3 Sensitive		$92.0 \pm 3.0$	IN S
	N	Ulota phyllantha	a Moss				S2	3 Sensitive	4	$66.2 \pm 0.0$	NB
	N	Anomobryum filiforme	a moss				S2	5 Undetermined	4	66.1 ± 1.0	NB
	N	Cladonia macrophylla	Fig-leaved Lichen				S2	5 Undetermined	3	58.5 ± 1.0	NB
		Fuscopannaria					00		-	07 4 0 0	NB
	N	leucosticta	Rimmed Shingles Lichen				S2	2 May Be At Risk	(	$67.4 \pm 0.0$	
	N	l entoqium milligranum	Stretched Jellyskin Lichen				S2	5 Undetermined	6	$146 \pm 0.0$	NB
	N	Nonbromo loovigotum	Musterd Kidney Lieben				62	2 May Ba At Biak	21	602.00	DE
	IN		Mustaru Riuney Lichen				32	2 IVIAY DE AL RISK	21	$09.3 \pm 0.0$	FE
	N	Anacampiodon	a Moss				S2?	3 Sensitive	2	66.3 ± 1.0	NB
		splachnoides					-				
	N	Andreaea rothii	a Moss				S2?	3 Sensitive	5	56.2 ± 0.0	NB
	N	Anomodon minor	Blunt-leaved Anomodon Moss				S2?	2 May Be At Risk	1	53.0 ± 1.0	NB
	N	Brvum pallescens	Pale Bryum Moss				S2?	5 Undetermined	1	76.7 ± 100.0	NB
	N	Dichelyma capillaceum	Hairlike Dichelyma Moss				S27	3 Sensitive	1	706+30	NB
		Hyarohynnum					021		•		NB
	N	montonum	a Moss				S2?	3 Sensitive	2	56.6 ± 1.0	ND
	NI	nontanum Seligerie diversifelie	- M				000	0. On a shift on		00.0.0.0	
	N	Seligena diversitolia	a Moss				52?	3 Sensitive	1	$98.3 \pm 0.0$	NB
	N	Sphagnum	a Peatmoss				S22	3 Sensitive	2	706 + 100	NB
		angermanicum					02.	0 001101110	-	10.0 1 10.0	
	N	Trichodon cylindricus	Cylindric Hairy-teeth Moss				S2?	3 Sensitive	2	43.5 ± 15.0	NB
	N	Plagiomnium rostratum	Long-beaked Leafy Moss				S2?	3 Sensitive	5	65.5 ± 0.0	NB
	N	Ramalina pollinaria	Chalky Ramalina Lichen				S2?	5 Undetermined	1	628+10	NB
	N	Collema lentaleum	Crumpled Bat's Wing Lichen				S22	5 Undetermined	1	881+00	NB
	N	Nonbroma arcticum	Arctic Kidnov Lichon				622 622	2 Sonsitivo	1	$63.1 \pm 0.0$	NB
	N						02:		1	66.2 . 0.0	
	IN	Bryum unginosum	a Moss				5253	3 Sensitive	1	$66.2 \pm 0.0$	IND
	N	Calliergonella	Common Large Wetland Moss				S2S3	3 Sensitive	4	565+50	NB
		cuspidata	g						-		
	N	Campylium	o Mooo				6060	2 Sonaitivo	1	610.00	NB
	IN .	polygamum	a 10055				3233	3 Sensitive	1	$01.0 \pm 0.0$	
	N	Palustriella falcata	a Moss				S2S3	3 Sensitive	2	656 + 00	NB
	N	Didymodon rigidulus	Rigid Screw Moss				S2S3	3 Sensitive	8	$615 \pm 20$	NB
	N	Enhamerum corrotum	a Moss				\$2\$3	3 Sonsitivo	5	7/3+00	NB
	IN	Orthotrichum	a 191033				0200	0 Genalive	2	14.3 ± 0.0	
	N	Onnotricnum	Showy Bristle Moss				S2S3	5 Undetermined	6	67.6 ± 4.0	INB
		speciosum							-		
	N	Pohlia proligera	Cottony Nodding Moss				S2S3	3 Sensitive	14	43.5 ± 15.0	NB
	N	Racomitrium	a Moss				6263	2 Soncitivo	2	586+00	NB
	IN	fasciculare	a 111055				5255	2 Selisitive	3	$50.0 \pm 0.0$	
	N	Racomitrium affine	a Moss				S2S3	3 Sensitive	1	54.2 ± 1.0	NB
	N	Saelania glaucescens	Blue Dew Moss				S2S3	3 Sensitive	2	$586 \pm 00$	NB
									-		

Taxonomic								#		
Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
N	Sphagnum subfulvum	a Peatmoss				S2S3	2 May Be At Risk	3	78.8 ± 0.0	PE
	Taxinhvllum					0200	2 may 20 / 4 / 401	Ū		NB
N	denlanatum	Imbricate Yew-leaved Moss				S2S3	3 Sensitive	2	60.8 ± 1.0	ne -
N	Zvaodon viridissimus	a Moss				\$2\$3	2 May Be At Risk	2	60.8 + 1.0	NB
N	Schistidium agassizii	Elf Bloom Moss				S2S3	3 Sensitive	2	$54.2 \pm 1.0$	NB
	Loeskeobnum					0200	0 Ochishive	0	04.2 ± 1.0	NB
N	brevirostre	a Moss				S2S3	3 Sensitive	17	56.2 ± 0.0	ND
	Curtomnium									
N	bymononbylloidos	Short-pointed Lantern Moss				S2S3	3 Sensitive	6	53.4 ± 0.0	ND
N	Cladania couminata	Scontily Clad Divia Lichan				6060	E Undetermined	2	657.10	
IN N	Cladonia acuminata					0200	5 Undetermined	2	$60.7 \pm 1.0$	
IN N	Cladonia ramulosa	Didii Licileli Greater Sulphur aug Lichen				0200	5 Undetermined	4	$50.0 \pm 1.0$	
IN	Ciauonia Supriuma	Greater Sulphur-cup Lichen				5253	5 Undetermined	1	$50.2 \pm 1.0$	
N	Denanscocaulon	a lichen				S2S3	3 Sensitive	1	90.8 ± 0.0	IND
N	Dermalianaia ambigua	Crean Starburgt Lisban				0000	E Lindotormined	4	60.0 . 1.0	
IN	Parmenopsis ambigua	Green Starburst Lichen				5253	5 Undetermined	1	$69.8 \pm 1.0$	
Ν	Spnaeropnorus	Northern Coral Lichen				S2S3	3 Sensitive	5	65.0 ± 1.0	NB
	giobosus					00	0.0	40	50.0 0.0	
N	Hypnum curvitolium	Curved-leaved Plait Moss				S3	3 Sensitive	10	$56.2 \pm 0.0$	NB
N	I ortella tragilis	Fragile Twisted Moss				S3	3 Sensitive	1	$66.3 \pm 0.0$	NB
N	Schistidium maritimum	a Moss				\$3	4 Secure	6	$61.8 \pm 0.0$	NB
Ν	Hymenostylium	Hymenostylium Moss				S3	3 Sensitive	5	66.6 ± 1.0	NB
	recurvirostre					00		0	04.0	NO
N	Collema nigrescens	Blistered Larpaper Lichen				S3	3 Sensitive	2	$81.8 \pm 0.0$	NS
N	Solorina saccata	Woodland Owl Lichen				\$3	5 Undetermined	6	65.7 ± 1.0	NB
N	Ahtiana aurescens	Eastern Candlewax Lichen				S3	5 Undetermined	1	85.4 ± 0.0	NB
N	Normandina pulchella	Rimmed Elf-ear Lichen				S3	5 Undetermined	4	60.8 ± 1.0	NB
N	Cladonia farinacea	Farinose Pixie Lichen				S3	5 Undetermined	6	58.4 ± 1.0	NB
N	Leptogium lichenoides	Tattered Jellyskin Lichen				S3	5 Undetermined	6	65.7 ± 1.0	NB
N	Nephroma bellum	Naked Kidney Lichen				S3	4 Secure	3	57.8 ± 1.0	NB
N	Peltigera degenii	Lustrous Pelt Lichen				S3	5 Undetermined	3	61.4 ± 1.0	NB
N	Usnea strigosa	Bushy Beard Lichen				S3	5 Undetermined	4	10.1 ± 0.0	NB
N	Leptogium laceroides	Short-bearded Jellyskin Lichen				S3	3 Sensitive	4	54.4 ± 1.0	NB
N	Peltigera	Membranous Pelt Lichen				63	5 Undetermined	٥	$657 \pm 10$	NB
	membranacea	Membranous Feit Elenen				00	o ondetermined	5	00.7 ± 1.0	
N	Cladonia carneola	Crowned Pixie-cup Lichen				S3	5 Undetermined	1	60.1 ± 1.0	NB
N	Cladonia deformis	Lesser Sulphur-cup Lichen				S3	4 Secure	5	58.5 ± 1.0	NB
N	Aulacomnium	Little Groove Moss				\$32	4 Secure	10	435 + 150	NB
	androgynum					00:		10	40.0 ± 10.0	
N	Bryum amblyodon	a Moss				S3?	4 Secure	1	86.1 ± 3.0	NS
N	Dicranella rufescens	Red Forklet Moss				S3?	5 Undetermined	1	66.3 ± 0.0	NB
N	Rhytidiadelphus loreus	Lanky Moss				S3?	2 May Be At Risk	1	66.1 ± 1.0	NB
N	Sphagnum lescurii	a Peatmoss				S3?	5 Undetermined	6	39.7 ± 0.0	NS
N	Stereocaulon	Coralloid Foam Lichen				632	5 Undetermined	1	$628 \pm 10$	NB
	subcoralloides	Coralioid Foam Eichen				00:	5 Ondetermined		02.0 ± 1.0	
N	Anomodon rugelii	Rugel's Anomodon Moss				S3S4	3 Sensitive	2	93.6 ± 0.0	NS
N	Barbula convoluta	Lesser Bird's-claw Beard Moss				S3S4	4 Secure	1	65.0 ± 15.0	NB
N	Brachythecium	Velvet Ragged Moss				\$3\$4	4 Secure	З	619+10	NB
	velutinum	Vervet rtugget moss				0004		0	01.5 ± 1.0	
N	Calliergon giganteum	Giant Spear Moss				S3S4	3 Sensitive	1	75.0 ± 0.0	PE
N	Dicranella cerviculata	a Moss				S3S4	3 Sensitive	4	55.8 ± 0.0	NS
N	Dicranum majus	Greater Broom Moss				S3S4	4 Secure	20	$53.4 \pm 0.0$	NB
Ν	Dicranum leioneuron	a Dicranum Moss				S3S4	4 Secure	2	15.7 ± 0.0	NB
N	Encalypta ciliata	Fringed Extinquisher Moss				S3S4	3 Sensitive	3	65.8 ± 0.0	NB
Ν	Fissidens bryoides	Lesser Pocket Moss				S3S4	4 Secure	6	61.8 ± 0.0	NB
Ν	Helodium blandowii	Wetland-plume Moss				S3S4	4 Secure	1	70.9 ± 0.0	PE
N	Heterocladium	Dimorphous Tangle Moss				S3S4	A Secure	5	$562 \pm 0.0$	NB
IN IN	dimorphum	Dimorphous rangie MUSS				0004		5	JU.2 ± 0.0	

Taxonomic								#		
Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
N	lsopterygiopsis muelleriana	a Moss			-	S3S4	4 Secure	21	53.4 ± 0.0	NB
Ν	Myurella julacea	Small Mouse-tail Moss				S3S4	4 Secure	2	66.3 ± 0.0	NB
Ν	Physcomitrium pyriforme	Pear-shaped Urn Moss				S3S4	3 Sensitive	1	79.2 ± 0.0	NB
Ν	Pogonatum dentatum	Mountain Hair Moss				S3S4	4 Secure	5	55.8 ± 0.0	NS
Ν	Sphagnum compactum	Compact Peat Moss				S3S4	4 Secure	4	73.3 ± 1.0	PE
Ν	Sphagnum quinquefarium	Five-ranked Peat Moss				S3S4	4 Secure	1	$60.4 \pm 0.0$	NB
Ν	Sphagnum torreyanum	a Peatmoss				S3S4	4 Secure	2	68.1 ± 0.0	NB
Ν	Sphagnum austinii	Austin's Peat Moss				S3S4	4 Secure	1	39.7 ± 0.0	NS
N	Sphagnum contortum	Twisted Peat Moss				S3S4	4 Secure	1	68.1 ± 0.0	NB
N	Tetraphis geniculata	Geniculate Four-tooth Moss				S3S4	4 Secure	13	54.2 ± 1.0	NB
Ν	Tetraplodon angustatus	Toothed-leaved Nitrogen Moss				S3S4	4 Secure	2	$77.5 \pm 0.0$	NS
Ν	Weissia controversa	Green-Cushioned Weissia				S3S4	4 Secure	2	66.6 ± 1.0	NB
Ν	Abietinella abietina	Wiry Fern Moss				S3S4	4 Secure	2	66.3 ± 0.0	NB
Ν	Trichostomum tenuirostre	Acid-Soil Moss				S3S4	4 Secure	6	58.6 ± 0.0	NB
Ν	Rauiella scita	Smaller Fern Moss				S3S4	3 Sensitive	1	83.6 ± 0.0	NB
Ν	Pannaria rubiginosa	Brown-eyed Shingle Lichen				S3S4	3 Sensitive	6	66.2 ± 1.0	NB
Ν	Ramalina thrausta	Angelhair Ramalina Lichen				S3S4	5 Undetermined	11	50.8 ± 1.0	NB
N	Hypogymnia vittata	Slender Monk's Hood Lichen				S3S4	4 Secure	22	50.8 ± 1.0	NB
Ν	Leptogium teretiusculum	Beaded Jellyskin Lichen				S3S4	5 Undetermined	6	69.9 ± 0.0	PE
Ν	Cladonia floerkeana	Gritty British Soldiers Lichen				S3S4	4 Secure	4	62.7 ± 1.0	NB
Ν	Hypocenomyce friesii	a Lichen				S3S4	5 Undetermined	1	65.7 ± 1.0	NB
Ν	Melanelia panniformis	Shingled Camouflage Lichen				S3S4	5 Undetermined	4	53.0 ± 1.0	NB
Ν	Nephroma parile	Powdery Kidney Lichen				S3S4	4 Secure	8	35.7 ± 0.0	NB
Ν	Protopannaria pezizoides	Brown-gray Moss-shingle Lichen				S3S4	4 Secure	15	65.0 ± 0.0	NB
Ν	Pseudocyphellaria	Gilded Specklebelly Lichen				S3S4	3 Sensitive	25	9.8 ± 0.0	NB
N	Stereocaulon paschale	Easter Foam Lichen				S3S4	5 Undetermined	1	275+10	NB
N	Pannaria conoplea	Mealv-rimmed Shingle Lichen				S3S4	3 Sensitive	17	$70.6 \pm 0.0$	PE
N	Anaptvchia palmulata	Shagov Fringed Lichen				S3S4	3 Sensitive	18	$54.4 \pm 1.0$	NB
	Peltigera					0004			50.4.4.0	NB
N	neopolydactyla					\$3\$4	5 Undetermined	9	$52.4 \pm 1.0$	
N	Ciadonia cariosa	Lesser Ridded Pixie Lichen				5354	4 Secure	3	$60.7 \pm 1.0$	
Ν	scalaris	Common Clam Lichen				S3S4	5 Undetermined	1	62.8 ± 1.0	
Ν	Dermatocarpon luridum	Brookside Stippleback Lichen				S3S4	4 Secure	12	50.2 ± 1.0	NB
N	Leucodon brachypus	a Moss				SH	2 May Be At Risk	13	55.2 ± 1.0	NB
Ν	Splachnum luteum	Yellow Collar Moss				SH	5 Undetermined	1	76.7 ± 100.0	NB
Ν	minutulum	Tiny Cedar Moss				SH	2 May Be At Risk	3	75.9 ± 10.0	ND
Р	Juglans cinerea	Butternut	Endangered	Endangered	Endangered	S1	1 At Risk	14	52.3 ± 1.0	NB
Ρ	Symphyotrichum laurentianum	Gulf of St Lawrence Aster	Threatened	Threatened	Endangered	S1	1 At Risk	32	79.5 ± 0.0	NB
	Symphyotrichum		0	0 10		00				NB
٢	supulatum (Bathurst pop)	Batnurst Aster - Batnurst pop.	Special Concern	Special Concern	⊨ndangered	52	T At RISK	20	$63.8 \pm 0.0$	
Ρ	Isoetes prototypus	Prototype Quillwort	Special Concern	Special Concern	Endangered	S2	1 At Risk	13	82.2 ± 0.0	NS
Р	Lechea maritima var.	Beach Pinweed	Special Concern			S2	3 Sensitive	486	42.8 ± 0.0	NB
Р	supcylinarica Cryptotaenia	Canada Honewort				S1	2 May Be At Risk	1	78.5 ± 1.0	NB

Taxonomic								#		
Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
	canadensis									
-	Antennaria howellii					<b>.</b>				PE
Р	ssp. petaloidea	Pussy-Toes				S1	2 May Be At Risk	3	89.1 ± 5.0	
	Symphyotrichum									NB
D	subulatum (non-	Annual Saltmarsh Aster				<b>S1</b>	2 May Bo At Rick	12	$631 \pm 0.0$	ne -
1	Bathurst pop)	Annual Galimarsh Aster				01	2 May De At Misk	12	03.1 ± 0.0	
	Baudagpaphalium									
Р	r seudognaphalium	Eastern Cudweed				S1	2 May Be At Risk	27	49.6 ± 5.0	IND
-	obtusifolium	<b>B</b> · · · · · ·				<i></i>				
Р	Hieracium paniculatum	Panicled Hawkweed				S1	2 May Be At Risk	1	$98.5 \pm 1.0$	NS
Р	Hieracium robinsonii	Robinson's Hawkweed				S1	3 Sensitive	9	$53.9 \pm 0.0$	NB
Р	Solidago multiradiata	Multi-rayed Goldenrod				S1	2 May Be At Risk	19	23.8 ± 0.0	NB
D	Cardamine parviflora	Small flowored Bittercross				<b>S1</b>	2 May Bo At Dick	10	$97.1 \pm 1.0$	NS
Г	var. arenicola	Sinali-liowered Differeness				51	Z IVIAY DE AL MISK	10	07.4 ± 1.0	
Р	Draba arabisans	Rock Whitlow-Grass				S1	2 May Be At Risk	33	54.6 ± 0.0	NB
Р	Draba glabella	Rock Whitlow-Grass				S1	2 May Be At Risk	7	66.0 ± 0.0	NB
Р	Stellaria crassifolia	Fleshy Stitchwort				S1	2 May Be At Risk	3	$18.5 \pm 5.0$	NB
P	Chenonodium simplex	Maple-leaved Goosefoot				S1	2 May Be At Risk	6	417 + 10	NB
D	Suanda rolandii	Poland's Soa Blito				S1	2 Sonsitivo	5	$300 \pm 0.0$	NB
	Triadonum virginioum	Virginia St. John's wort				01	2 May De At Diele	3	$30.9 \pm 0.0$	NC
P		Virginia Si John S-wort				51	2 IVIAY DE AL RISK	1	$92.0 \pm 3.0$	
P	Corema conradii	Broom Crowberry				51	2 May Be At Risk	6	87.2 ± 0.0	PE
Р	Vaccinium boreale	Northern Blueberry				S1	2 May Be At Risk	5	22.8 ± 1.0	NB
P	Chamaesyce	Seaside Spurge				S1	2 May Be At Risk	16	$56.0 \pm 0.0$	NB
•	polygonifolia	ocasiae opurge				01	2 May Do At Nisk	10	50.0 ± 0.0	
Р	Proserpinaca pectinata	Comb-leaved Mermaidweed				S1	2 May Be At Risk	2	66.8 ± 5.0	NS
Р	Primula laurentiana	Laurentian Primrose				S1	2 May Be At Risk	28	66.3 ± 0.0	NB
Р	Amelanchier fernaldii	Fernald's Serviceberry				S1	2 May Be At Risk	2	$25.0 \pm 1.0$	NB
P	Crataequs ionesiae	lones' Hawthorn				S1	2 May Be At Risk	1	871+10	NB
D	Dryas integrifolia	Entire leaved Mountain Avens				S1	2 May Bo At Pick	14	22.8 + 2.0	NB
	Diyas integritolia Dotontillo conodonsis	Conodo Cinquefoil				01 01	E Undetermined	1	22.0 ± 5.0	ND
Г	F Oler Illia Canaderisis	Canada Cinqueion				31	5 Undetermined	1	$97.1 \pm 0.0$	
Р	waidsteinia	Barren Strawberry				S1	2 May Be At Risk	1	32.0 ± 1.0	IND
-	tragarioides					<b>.</b>		~ .		
Р	Salix myrtillifolia	Blueberry Willow				S1	2 May Be At Risk	24	$23.6 \pm 0.0$	NB
P	Saxifraga paniculata	White Mountain Saxifrage				S1	2 May Be At Risk	35	$65.3 \pm 0.0$	NB
•	ssp. neogaea	White Mountain Oaxinage				01	2 May Do A Ritok	00	00.0 ± 0.0	
D	Agalinis paupercula	Small floworod Agalinis				<b>S1</b>	2 May Bo At Dick	20	126+00	NS
Г	var. borealis	Sinali-liowered Againis				51	Z IVIAY DE AL MISK	39	$42.0 \pm 0.0$	
D	Viola sagittata var.	Arrow Leaved Vielet				C1	O May Da At Diale	4	000.00	NS
P	ovata	Allow-Leaved Violet				51	2 IVIAY DE AL RISK	1	89.9 ± 2.0	
Р	Carex annectens	Yellow-Fruited Sedge				S1	2 May Be At Risk	3	$22.5 \pm 0.0$	NB
_	Carex atlantica ssp	· · · · · · · · · · · · · · · · · · ·					,	-		NB
Р	atlantica	Atlantic Sedge				S1	2 May Be At Risk	8	34.7 ± 0.0	ne -
D	Carex backii	Rocky Mountain Sedge				<b>S1</b>	2 May Bo At Rick	3	$411 \pm 0.0$	NB
		Nocky Wouldain Sedge				01	2 Ividy De Al Risk	3	41.1 ± 0.0	
P						51	2 IVIAY DE AL RISK	1	41.6 ± 0.0	IND
Р	Carex scirpoidea	Scirpuslike Sedge				51	2 May Be At Risk	6	$78.2 \pm 0.0$	NB
Р	Carex sterilis	Sterile Sedge				S1	2 May Be At Risk	1	52.7 ± 2.0	NB
Р	Carex grisea	Inflated Narrow-leaved Sedge				S1	2 May Be At Risk	1	79.7 ± 5.0	NB
Р	Scirpus pendulus	Hanging Bulrush				S1	2 May Be At Risk	7	41.0 ± 0.0	NS
	Sisyrinchium	Nemerical Diversity of success				04	O Maria Da At Diala	0		NS
Р	anqustifolium	Narrow-leaved Blue-eyed-grass				51	2 May Be At RISK	3	$53.5 \pm 5.0$	
Р	Juncus areenei	Greene's Rush				S1	2 May Be At Risk	10	35.7 ± 0.0	NB
Р	Juncus stvaius	Moor Rush				S1	2 May Be At Risk	1	972+00	NB
	Juncus stygius sen						= may bo / ( 1())K		JI.2 2 0.0	NB
Р	americanus	Moor Rush				S1	2 May Be At Risk	16	37.7 ± 5.0	
D	Goodyora pubasaana	Downy Pattloopako Plantain				<b>S1</b>	2 May Bo At Blak	5	$40.0 \pm 0.0$	
		Downy Ralleshake-Fidilan				01	2 IVIAY DE AL RISK	5	40.9 ± 0.0	ND
٢	iviaiaxis pracnypoda	white Adder S-Wouth				51	∠ may be At RISK	5	00.9 ± 0.0	INS
Р	Platanthera	Large Round-Leaved Orchid				S1	2 May Be At Risk	3	17.9 ± 0.0	NB
	macrophylla					-	,	-		

Taxonomic								#		
Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
Р	Calamagrostis stricta ssp. inexpansa	Slim-stemmed Reed Grass				S1	2 May Be At Risk	2	32.7 ± 1.0	NB
Р	Danthonia compressa	Flattened Oat Grass				S1	2 May Be At Risk	17	$21.2 \pm 0.0$	NB
Р	Festuca subverticillata	Nodding Fescue				S1	2 May Be At Risk	10	77.2 ± 0.0	NS
Р	Puccinellia ambiqua	Dwarf Alkali Grass				S1	5 Undetermined	1	93.1 ± 5.0	PE
Р	Potamogeton friesii	Fries' Pondweed				S1	2 May Be At Risk	7	42.9 ± 0.0	NS
Р	Cystopteris laurentiana	Laurentian Bladder Fern				S1	2 May Be At Risk	1	76.5 ± 1.0	NB
Р	Dryopteris filix-mas	Male Fern				S1	2 May Be At Risk	2	30.1 ± 1.0	NB
Р	Schizaea pusilla	Little Curlygrass Fern				S1	2 May Be At Risk	9	60.7 ± 0.0	NB
Р	Bidens heterodoxa	Connecticut Beggar-Ticks				S1?	2 May Be At Risk	2	92.5 ± 0.0	NB
Р	Carex laxiflora	Loose-Flowered Sedge				S1?	5 Undetermined	2	96.0 ± 1.0	NS
Р	Selaginella rupestris	Rock Spikemoss				S1S2	2 May Be At Risk	7	69.9 ± 1.0	NB
Р	Cuscuta cephalanthi	Buttonbush Dodder				S1S3	2 May Be At Risk	5	$22.2 \pm 0.0$	NB
Р	Eriophorum russeolum var. albidum	Russet Cotton-Grass				S1S3	5 Undetermined	1	31.8 ± 1.0	NB
Р	Scirpus atrovirens	Dark-green Bulrush				S1S3	5 Undetermined	1	63.2 ± 0.0	PE
Р	Listera australis	Southern Twayblade			Endangered	S2	1 At Risk	16	15.6 ± 0.0	NB
Р	Osmorhiza longistylis	Smooth Sweet Cicely			0	S2	3 Sensitive	8	62.6 ± 1.0	NS
Ρ	Pseudognaphalium macounii	Macoun's Cudweed				S2	3 Sensitive	41	44.0 ± 5.0	NB
Р	Ionactis linariifolius	Stiff Aster				S2	3 Sensitive	1	$78.2 \pm 5.0$	NB
P	Impatiens pallida	Pale Jewelweed				S2	2 May Be At Risk	6	$77.1 \pm 0.0$	NS
P	Arabis drummondii	Drummond's Rockcress				S2	3 Sensitive	19	$40.8 \pm 0.0$	NB
Р	Sagina nodosa	Knotted Pearlwort				S2	3 Sensitive	2	88.8 ± 0.0	PE
Ρ	Sagina nodosa ssp. borealis	Knotted Pearlwort				S2	3 Sensitive	2	87.9 ± 0.0	PE
Р	Stellaria longifolia	Long-leaved Starwort				S2	3 Sensitive	9	34.4 ± 1.0	NB
Р	Atriplex franktonii	Frankton's Saltbush				S2	4 Secure	6	$30.4 \pm 0.0$	NB
Р	Chenopodium rubrum	Red Pigweed				S2	3 Sensitive	10	$26.7 \pm 0.0$	NB
D	Hypericum	Dia muia a d. Ct. Jaharla unant				00	0.0		01.0.0.0	NS
٢	dissimulatum	Disguised St John S-wort				52	3 Sensitive	4	$61.0 \pm 0.0$	
Р	Triosteum aurantiacum	Orange-fruited Tinker's Weed				S2	3 Sensitive	7	$37.4 \pm 0.0$	NB NB
Р	canadensis	Soapberry				S2	3 Sensitive	41	19.2 ± 0.0	
Р	Oxytropis campestris var. johannensis	Field Locoweed				S2	3 Sensitive	25	86.7 ± 1.0	NS
Р	Gentiana linearis	Narrow-Leaved Gentian				S2	3 Sensitive	1	61.3 ± 50.0	NB
Р	Myriophyllum humile	Low Water Milfoil				S2	3 Sensitive	1	59.3 ± 1.0	NB
Р	Proserpinaca palustris var. crebra	Marsh Mermaidweed				S2	3 Sensitive	1	$94.8 \pm 0.0$	NS
Р	Hedeoma pulegioides	American False Pennyroyal				S2	4 Secure	8	65.0 ± 1.0	NS
Р	Nuphar lutea ssp. rubrodisca	Red-disked Yellow Pond-lily				S2	3 Sensitive	11	$12.4 \pm 0.0$	NB
Р	Polygala paucifolia	Fringed Milkwort				S2	3 Sensitive	5	76.3 ± 1.0	NB
Р	Polygonum careyi	Carey's Smartweed				S2	3 Sensitive	2	33.9 ± 1.0	NB
Р	Anemone parviflora	Small-flowered Anemone				S2	3 Sensitive	8	$23.8 \pm 0.0$	NB
Ρ	Hepatica nobilis var. obtusa	Round-lobed Hepatica				S2	3 Sensitive	4	95.2 ± 1.0	NB
Р	Crataegus scabrida	Rough Hawthorn				S2	3 Sensitive	4	35.6 ± 1.0	NB
Р	Crataegus succulenta	Fleshy Hawthorn				S2	3 Sensitive	2	65.9 ± 0.0	PE
Р	Euphrasia randii	Rand's Eyebright				S2	2 May Be At Risk	4	67.9 ± 0.0	PE
Р	Scrophularia lanceolata	Lance-leaved Figwort				S2	3 Sensitive	2	75.2 ± 1.0	NB
Ρ	Dirca palustris	Eastern Leatherwood				S2	2 May Be At Risk	1	13.9 ± 1.0	NB
Р	Sagittaria calycina var.	Long-lobed Arrowhead				S2	4 Secure	67	55.1 ± 0.0	NB
Р	Symplocarpus foetidus	Eastern Skunk Cabbage				S2	3 Sensitive	117	40.2 ± 1.0	NS

	Taxonomic								#		
	Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
-	P	Carex comosa	Bearded Sedge				S2	2 May Be At Risk	7	32.6 ± 0.0	NB
	P	Carex granularis	Limestone Meadow Sedge				S2	3 Sensitive	10	226+00	NB
	P	Carex gynocrates	Northern Bog Sedge				S2	3 Sensitive	1	$752 \pm 10$	NB
	P	Carex hirtifolia	Pubescent Sedge				S2	3 Sensitive	12	376+00	NB
	1	Carex livida var	Tubescent Deuge				02	5 Genative	12	57.0 ± 0.0	NS
	Р	radicaulis	Livid Sedge				S2	3 Sensitive	8	$38.9 \pm 0.0$	NO
	Р	Carex plantaginea	Plantain-Leaved Sedge				S2	3 Sensitive	1	67.4 ± 0.0	NB
	Р	Carex rostrata	Narrow-leaved Beaked Sedge				S2	3 Sensitive	2	61.0 ± 0.0	NB
	Р	Carex sprengelii	Longbeak Sedge				S2	3 Sensitive	2	$83.1 \pm 0.0$	NB
	P	Carex tenuiflora	Sparse-Flowered Sedge				S2	2 May Be At Risk	9	$42.0 \pm 0.0$	NS
	Ρ	Carex albicans var.	White-tinged Sedge				S2	3 Sensitive	12	23.7 ± 0.0	NB
	Р	Eriophorum gracile	Slender Cottongrass				S2	2 May Be At Risk	50	15.4 ± 0.0	NB
	Р	Blysmus rufus	Red Bulrush				S2	3 Sensitive	32	67.3 ± 0.0	PE
	Р	Juncus vasevi	Vasev Rush				S2	3 Sensitive	12	$107 \pm 00$	NB
	P	Allium tricoccum	Wild Leek				S2	2 May Be At Risk	16	$40.5 \pm 0.0$	NB
	•	Calvoso bulbosa var					02	2 May Do At Riok	10	10.0 ± 0.0	NB
	Р	americana	Calypso				S2	2 May Be At Risk	2	$44.6 \pm 5.0$	ND
	Р	Coeloglossum viride var. virescens	Long-bracted Frog Orchid				S2	2 May Be At Risk	5	28.2 ± 10.0	NB
	Р	Cypripedium parviflorum var.	Small Yellow Lady's-Slipper				S2	2 May Be At Risk	1	98.9 ± 7.0	NS
	<b>D</b>		Manairal Dattleanalta plantain				00	0. O a stations		75 5 . 0 0	DE
	P	Goodyera obiongifolia	Menzies Rattiesnake-plantain				52	3 Sensitive	1	75.5 ± 0.0	PE
	P	Spirantnes lucida	Shining Ladies - I resses				52	3 Sensitive	1	44.9 ± 1.0	NB
	Р	Spiranthes ochroleuca	Yellow Ladies'-tresses				S2	2 May Be At Risk	6	$24.1 \pm 0.0$	NB
	Р	linearifolium	Narrow-leaved Panic Grass				S2	3 Sensitive	1	$86.9 \pm 0.0$	NB
	Р	Elymus canadensis	Canada Wild Rye				S2	2 May Be At Risk	1	22.0 ± 1.0	NB
	Р	Piptatherum canadense	Canada Rice Grass				S2	3 Sensitive	3	31.1 ± 10.0	NB
	Р	Poa glauca	Glaucous Blue Grass				S2	4 Secure	21	$625 \pm 00$	NB
	P	Puccinellia laurentiana	Nootka Alkali Grass				S2	3 Sensitive	1	85.8 + 10.0	NB
	•	Puccinellia					02	o cononivo	•	00.0 1 10.0	NB
	Р	phrvganodes	Creeping Alkali Grass				S2	3 Sensitive	2	31.3 ± 1.0	
	Р	Schizachyrium scoparium	Little Bluestem				S2	3 Sensitive	3	97.4 ± 0.0	NB
	D	Zizania aquatica var.	Indian Wild Rice				S2	5 Undetermined	5	$615 \pm 0.0$	NB
	F	aquatica					52		-	01.5 ± 0.0	
	Р	Piptatherum pungens	Slender Rice Grass				S2	2 May Be At Risk	5	$40.8 \pm 0.0$	NB
	Р	Potamogeton vaseyi	Vasey's Pondweed				S2	3 Sensitive	1	61.2 ± 0.0	PE
	Р	Asplenium trichomanes	Maidenhair Spleenwort				S2	3 Sensitive	14	41.3 ± 1.0	NB
	Р	Woodwardia virginica	Virginia Chain Fern				S2	3 Sensitive	4	$41.9 \pm 0.0$	NS
	P	Woodsia alpina	Alpine Cliff Fern				S2	3 Sensitive	4	$53.5 \pm 0.0$	NB
	P	l vcopodium sitchense	Sitka Clubmoss				S2	3 Sensitive	4	$202 \pm 0.0$	NB
	•	Selaginella					02	o cononivo	•	20.2 2 0.0	NB
	Р	selaginoides	Low Spikemoss				S2	3 Sensitive	8	62.5 ± 0.0	
	Ρ	l oxicodendron radicans	Poison Ivy				S2?	3 Sensitive	7	$43.4 \pm 0.0$	NB
	Ρ	Symphyotrichum novi- belgii var. crenifolium	New York Aster				S2?	5 Undetermined	5	$43.4 \pm 0.0$	NB
	Ρ	Humulus lupulus var. Iupuloides	Common Hop				S2?	3 Sensitive	2	63.7 ± 5.0	NB
	Р	Rubus recurvicaulis	Arching Dewberry				S2?	4 Secure	4	11.0 ± 1.0	NB
	Р	Galium obtusum	Blunt-leaved Bedstraw				S2?	4 Secure	7	37.4 ± 10.0	NB
	Р	Salix myricoides	Bayberry Willow				S2?	3 Sensitive	1	23.6 ± 1.0	NB
		-									

Taxonomic								#		
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P	Carex vacillans	Estuarine Sedge				S2?	3 Sensitive	1	37.5 ± 0.0	NB
Р	Platanthera huronensis	Fragrant Green Orchid				S2?	5 Undetermined	1	81.1 ± 10.0	NS
Р	Solidago altissima	Tall Goldenrod				S2S3	4 Secure	1	$39.6 \pm 0.0$	NB
Р	Barbarea orthoceras	American Yellow Rocket				S2S3	3 Sensitive	2	76.5 ± 1.0	NB
Р	Ceratophyllum echinatum	Prickly Hornwort				S2S3	3 Sensitive	26	12.9 ± 0.0	NB
Р	Callitriche hermaphroditica	Northern Water-starwort				S2S3	4 Secure	8	31.4 ± 0.0	NB
Р	Elatine americana	American Waterwort				S2S3	3 Sensitive	6	32.7 ± 0.0	NB
Р	Bartonia paniculata	Branched Bartonia				S2S3	3 Sensitive	1	51.0 ± 0.0	NS
Р	Bartonia paniculata ssp. iodandra	Branched Bartonia				S2S3	3 Sensitive	24	$57.6 \pm 0.0$	NB
Р	Geranium robertianum	Herb Robert				S2S3	4 Secure	82	47.5 ± 0.0	NB
Р	Epilobium coloratum	Purple-veined Willowherb				S2S3	3 Sensitive	5	30.7 ± 1.0	NB
Р	Rumex maritimus var. persicarioides	Peach-leaved Dock				S2S3	5 Undetermined	2	79.6 ± 0.0	NB
Р	Rumex pallidus	Seabeach Dock				S2S3	3 Sensitive	7	59.4 ± 0.0	NB
Р	Rubus pensilvanicus	Pennsvlvania Blackberrv				S2S3	4 Secure	27	25.1 ± 0.0	NB
Р	Galium labradoricum	Labrador Bedstraw				S2S3	3 Sensitive	14	39.6 ± 0.0	NB
Р	Carex adusta	Lesser Brown Sedge				S2S3	4 Secure	8	11.0 ± 0.0	NB
Р	Corallorhiza maculata var. occidentalis	Spotted Coralroot				S2S3	3 Sensitive	6	22.4 ± 10.0	NB
Р	Listera auriculata	Auricled Twavblade				S2S3	3 Sensitive	1	65.6 ± 0.0	NB
Р	Spiranthes cernua	Nodding Ladies'-Tresses				S2S3	3 Sensitive	17	$18.0 \pm 0.0$	NB
Р	Eragrostis pectinacea	Tufted Love Grass				S2S3	4 Secure	5	11.8 ± 0.0	NB
Р	Stuckenia filiformis ssp. alpina	Thread-leaved Pondweed				S2S3	3 Sensitive	2	27.5 ± 1.0	NB
Р	Stuckenia pectinata	Sago Pondweed				S2S3	3 Sensitive	51	21.0 ± 0.0	NB
Р	Potamogeton praelongus	White-stemmed Pondweed				S2S3	4 Secure	11	38.7 ± 0.0	NS
Р	Ophioglossum pusillum	Northern Adder's-tongue				S2S3	3 Sensitive	5	$43.0 \pm 0.0$	NS
Р	Panax trifolius	Dwarf Ginseng				S3	3 Sensitive	23	21.4 ± 0.0	NB
Р	Artemisia campestris	Field Wormwood				S3	4 Secure	3	70.8 ± 0.0	NB
Р	Artemisia campestris	Field Wormwood				S3	4 Secure	5	70.3 ± 10.0	NB
Р	Bidens hyperborea	Estuary Beggarticks				S3	4 Secure	30	37.6 ± 0.0	NB
Р	Bidens hyperborea var. hyperborea	Estuary Beggarticks				S3	4 Secure	3	37.4 ± 1.0	NB
Р	Erigeron hyssonifolius	Hysson-leaved Eleabane				S3	4 Secure	68	204+10	NB
P	Prenanthes racemosa	Glaucous Rattlesnakeroot				S3	4 Secure	2	97.0 + 0.0	NB
P	Symphyotrichum	Boreal Aster				S3	3 Sensitive	14	39.5 ± 0.0	NB
D	Botula pumila	Bog Birch				63	A Socuro	20	211+00	NR
г D	Arabis glabra	Tower Mustard				53 62	5 Undetermined	1	$34.4 \pm 0.0$ 78.2 ± 0.0	NB
F	Arabis giabra Arabis birsuta var	Tower Musiciu				33	5 Undetermined	I.	70.2 ± 0.0	
Р	pycnocarpa	Western Hairy Rockcress				S3	4 Secure	13	21.0 ± 0.0	ND
Р	Cardamine maxima	Large Toothwort				S3	4 Secure	9	$78.3 \pm 0.0$	NB
Р	Subularia aquatica var. americana	Water Awlwort				S3	4 Secure	2	$60.5 \pm 0.0$	NB
Р	Stellaria humifusa	Saltmarsh Starwort				S3	4 Secure	19	18.7 ± 5.0	NB
Р	Hudsonia tomentosa	Woolly Beach-heath				S3	4 Secure	220	$30.9 \pm 0.0$	NB
Р	Cornus amomum ssp. obliaua	Pale Dogwood				S3	3 Sensitive	12	97.5 ± 0.0	NB
Р	Crassula aquatica	Water Pygmyweed				S3	4 Secure	5	60.7 ± 0.0	NB
Р	Rhodiola rosea	Roseroot				S3	4 Secure	39	$54.4 \pm 0.0$	NB
Р	Penthorum sedoides	Ditch Stonecrop				S3	4 Secure	27	$34.6 \pm 0.0$	NB
Р	Elatine minima	Small Waterwort				S3	4 Secure	1	61.0 ± 0.0	NB

Taxonomic								#		
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P	Geranium bicknellii	Bicknell's Crane's-bill				S3	4 Secure	18	$11.0 \pm 0.0$	NB
Р	Myriophyllum farwellii	Farwell's Water Milfoil				S3	4 Secure	9	339 + 10	NB
	Myriophyllum							U U	0010 - 110	NB
Р	heterophyllum	Variable-leaved Water Milfoil				S3	4 Secure	2	97.0 ± 0.0	ne -
	Myrionbyllum									NB
Р	vorticillotum	Whorled Water Milfoil				S3	4 Secure	13	34.1 ± 1.0	ND
<b>D</b>		Canada Carmandar				<u>60</u>	2 Consitius	444	22.2.0.0	
P	Teuchum canadense	Canada Germander				53	3 Sensitive	111	$23.3 \pm 0.0$	
Р	Nupnar lutea ssp.	Small Yellow Pond-lilv				S3	4 Secure	7	$30.6 \pm 0.0$	NB
_	pumila									
Р	Epilobium hornemannii	Hornemann's Willowherb				S3	4 Secure	3	64.5 ± 1.0	NB
Р	Epilobium hornemannii	Hornemann's Willowherb				S3	4 Secure	1	646+00	NB
•	ssp. hornemannii							•	0.110 ± 010	
Р	Epilobium strictum	Downy Willowherb				S3	4 Secure	27	13.1 ± 0.0	NB
Р	Polygala sanguinea	Blood Milkwort				S3	3 Sensitive	12	29.1 ± 0.0	NB
Р	Polygonum arifolium	Halberd-leaved Tearthumb				S3	4 Secure	95	9.1 ± 0.0	NB
Р	Polygonum punctatum	Dotted Smartweed				S3	4 Secure	4	28.8 ± 5.0	NB
<b>D</b>	Polygonum punctatum	Dette d Ora estura e d				00	4.0	00	00.0.4.0	NB
Р	var. confertiflorum	Dotted Smartweed				53	4 Secure	20	36.6 ± 1.0	
Р	Polvgonum scandens	Climbing False Buckwheat				S3	4 Secure	59	$32.2 \pm 0.0$	NB
	Samolus valerandi ssp									NB
Р	parviflorus	Seaside Brookweed				S3	4 Secure	120	15.3 ± 0.0	
D	Pyrola minor	Lesser Pyrola				63	1 Secure	5	$418 \pm 0.0$	NS
	Clamatia appidantalia	Durple Clometic				60	4 Secure	10	40.4 + 0.0	ND
	Benunoulus amolinii	Pulpie Ciemais				33 62	4 Secure	10	$40.4 \pm 0.0$	
P		Gineiin's water Buttercup				<b>3</b> 3	4 Secure	47	20.5 ± 1.0	
Р	i nalictrum venulosum	Northern Meadow-rue				\$3	4 Secure	1	$99.3 \pm 1.0$	PE
Р	Amelanchier	Canada Serviceberry				S3	4 Secure	19	$19.4 \pm 0.0$	NB
	canadensis									
Р	Rosa palustris	Swamp Rose				S3	4 Secure	3	$32.5 \pm 0.0$	NB
P	Sanguisorba	Canada Burnet				53	4 Secure	16	587+00	NB
	canadensis	Sanada Barriet				00		10	00.7 ± 0.0	
Р	Galium boreale	Northern Bedstraw				S3	4 Secure	10	50.2 ± 5.0	NS
Р	Salix interior	Sandbar Willow				S3	4 Secure	1	22.6 ± 1.0	NB
Р	Salix nigra	Black Willow				S3	3 Sensitive	5	91.0 ± 50.0	NB
Р	Salix pedicellaris	Bog Willow				S3	4 Secure	41	10.9 ± 0.0	NB
Р	Comandra umbellata	Bastard's Toadflax				S3	4 Secure	49	$21.2 \pm 0.0$	NB
Р	Limosella australis	Southern Mudwort				S3	4 Secure	70	$205 \pm 0.0$	NB
	Veronica serpvllifolia								2010 2 010	NB
Р	ssn humifusa	Thyme-Leaved Speedwell				S3	4 Secure	7	57.2 ± 0.0	
P	Pilea numila	Dwarf Clearweed				53	4 Secure	52	$35.1 \pm 0.0$	NB
D	Viola adunca	Hooked Violet				63	4 Socuro	5	$41.5 \pm 0.0$	NB
	Viola addrica	Northorn Rog Violat				60	4 Secure	1	$72.4 \pm 0.0$	DE
	Corox oquotilio					33 62	4 Secure	4	$72.4 \pm 0.0$	
P		Water Sedge				53	4 Secure	23	$21.0 \pm 0.0$	NB
P	Carex arcta	Northern Clustered Sedge				53	4 Secure	3	$38.3 \pm 20.0$	NB
Р	Carex atratiformis	Scabrous Black Sedge				\$3	4 Secure	3	$77.4 \pm 0.0$	NS
Р	Carex capillaris	Hairlike Sedge				S3	4 Secure	16	50.1 ± 0.0	NS
Р	Carex chordorrhiza	Creeping Sedge				S3	4 Secure	54	29.7 ± 0.0	NB
Р	Carex conoidea	Field Sedge				S3	4 Secure	9	22.6 ± 0.0	NB
Р	Carex eburnea	Bristle-leaved Sedge				S3	4 Secure	11	36.0 ± 100.0	NB
Р	Carex exilis	Coastal Sedge				S3	4 Secure	6	58.7 ± 0.0	NS
Р	Carex garberi	Garber's Sedge				S3	3 Sensitive	1	26.4 ± 0.0	NB
Р	Carex haydenii	Havden's Sedae				S3	4 Secure	3	$9.2 \pm 0.0$	NB
P	Carex lupulina	Hop Sedge				S3	4 Secure	17	$34.6 \pm 0.0$	NB
P	Carex michauxiana	Michaux's Sedge				S3	4 Secure	10	313+10	NB
P	Carex ormostachya	Necklace Spike Sedge				\$3	4 Secure	5	378+10	NB
, D	Carey rosea	Posy Sodao				63		12	$715 \pm 0.0$	NB
F D	Carox toporo	Tondor Sodao				63	4 Socure	10	$71.5 \pm 0.0$	
		Tuekermenie Sedae				00		11	$1.0 \pm 0.0$	
r	Carex luckermanii	i uckeiman's Seuge				33	4 Secure	24	$42.9 \pm 0.0$	IND

Taxonomic								#		
Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
P	Carex wiegandii	Wiegand's Sedge				S3	4 Secure	120	$5.2 \pm 0.0$	NB
P	Carex recta	Estuary Sedge				S3	4 Secure	14	$271 \pm 0.0$	NB
P	Cyperus dentatus	Toothed Flatsedge				53 53	1 Secure	10	$59.5 \pm 1.0$	NB
P	Cyperus esculentus	Perennial Yellow Nutsedge				S3	4 Secure	5	$55.0 \pm 1.0$	NB
I D	Elecoborio intermedio	Mattad Spikerush				62	4 Secure	1	62.4 + 0.0	ND
F	Eleocriaris internieula	Matted Spikerusi				33	4 Secure	1	$03.4 \pm 0.0$	
Р	Rnynchospora	Small-headed Beakrush				S3	4 Secure	2	80.1 ± 0.0	NB
Р	Rhynchospora fusca	Brown Beakrush				\$3	4 Secure	10	391+00	NS
P	Trichophorum clintonii	Clinton's Clubrush				S3	4 Secure	24	$64.2 \pm 0.0$	NB
-	Schoenoplectus					•••				NB
Р	fluviatilis	River Bulrush				S3	3 Sensitive	4	12.4 ± 1.0	
Р	Schoenoplectus torreyi	Torrey's Bulrush				S3	4 Secure	4	12.0 ± 0.0	NB
Р	Lemna trisulca	Star Duckweed				S3	4 Secure	18	19.2 ± 0.0	NB
Р	Cypripedium reginae	Showy Lady's-Slipper				S3	3 Sensitive	33	39.2 ± 0.0	NB
Р	Liparis loeselii	Loesel's Twayblade				S3	4 Secure	32	$26.3 \pm 0.0$	NB
-	Platanthera					•••			2010 2 010	NB
Р	blephariglottis	White Fringed Orchid				S3	4 Secure	181	$2.2 \pm 0.0$	
Р	Platanthera grandiflora	Large Purple Fringed Orchid				S3	3 Sensitive	23	28.9 ± 1.0	NB
Р	Bromus latiglumis	Broad-Glumed Brome				S3	3 Sensitive	23	$32.2 \pm 0.0$	NB
5	Calamagrostis					00	4.0	-	10.0 0.0	NB
Р	pickeringii	Pickering's Reed Grass				\$3	4 Secure	1	$48.2 \pm 0.0$	
Р	Dicnantheilum	Starved Panic Grass				S3	4 Secure	6	51.7 ± 0.0	NB
	Detemogration									ND
Р	Polamoyelon	Blunt-leaved Pondweed				S3	4 Secure	32	25.7 ± 0.0	IND
<b>D</b>		North and Malland Fried Orean				00	4.0	<b>F7</b>	45 7 . 0.0	
P		Nonnem reliow-Eyed-Grass				53	4 Secure	57	$15.7 \pm 0.0$	IND
P	Zannichellia palustris	Horned Pondweed				\$3	4 Secure	44	$20.3 \pm 0.0$	NB
Р	Adiantum pedatum	Northern Maidenhair Fern				\$3	4 Secure	1	95.2 ± 1.0	NB
Р	Cryptogramma stelleri	Steller's Rockbrake				S3	4 Secure	2	$92.5 \pm 0.0$	NS
Р	Asplenium trichomanes-ramosum	Green Spleenwort				S3	4 Secure	12	41.2 ± 1.0	NB
_	Dryopteris fragrans					-				NB
Р	var. remotiuscula	Fragrant Wood Fern				S3	4 Secure	47	$52.0 \pm 0.0$	
Р	Woodsia glabella	Smooth Cliff Fern				S3	4 Secure	44	52.0 ± 0.0	NB
Р	lsoetes tuckermanii	Tuckerman's Quillwort				S3	4 Secure	3	$57.6 \pm 0.0$	NB
	Lycopodium							Ũ	0110 - 010	NB
Р	sabinifolium	Ground-Fir				S3	4 Secure	16	$18.5 \pm 0.0$	
Р	Huperzia appalachiana	Appalachian Fir-Clubmoss				S3	3 Sensitive	26	65.6 ± 0.0	NB
Р	Botrvchium dissectum	Cut-leaved Moonwort				S3	4 Secure	9	$24.4 \pm 1.0$	NB
	Botrychium									NB
Р	lanceolatum var.	Lance-Leaf Grape-Fern				S3	3 Sensitive	12	$19.6 \pm 0.0$	
	angustisegmentum									
P	Botrychium simplex	Least Moonwort				\$3	4 Secure	6	$27.6 \pm 0.0$	NB
1	Polypodium	Least Moonwort				00	4 Decure	0	27.0 ± 0.0	NB
Р	appalachianum	Appalachian Polypody				S3	4 Secure	27	26.8 ± 1.0	ND
Р	Crataegus submollis	Quebec Hawthorn				\$3?	3 Sensitive	1	925+70	NS
P	Mertensia maritima	Sealupgwort				S3S/		7	$37.7 \pm 0.0$	NB
I D	Suppode celecoliformie	Herned See blite				6264	4 Secure	26	00.50	ND
Г D	Muriophyllum sibirioum	Siborian Water Milfeil				6364 6264		50	J.J I J.U 12 9 1 0 0	NG
	Nynopnynunn sibincum					0004		0	$+3.0 \pm 0.0$	
r D	Otricularia gippa					0004	4 Secure	4	$30.1 \pm 0.0$	ND
Ч	Rumex maritimus	Sea-Side Dock				5354	4 Secure	62	$12.2 \pm 0.0$	NB
Р	Rumex maritimus var. fueginus	Tierra del Fuego Dock				S3S4	4 Secure	28	11.3 ± 0.0	NB
Р	Rubus chamaemorus	Cloudberry				S3S4	4 Secure	60	29.3 ± 0.0	NB
Р	Geocaulon lividum	Northern Comandra				S3S4	4 Secure	39	$1.4 \pm 0.0$	NB
Р	Juniperus horizontalis	Creeping Juniper				S3S4	4 Secure	14	$25.7 \pm 1.0$	NB
P	Cladium mariscoides	Smooth Twigrush				\$3\$4	4 Secure	7	$316 \pm 10$	NB
•	5.34ium manocoid00							'	00 ± 1.0	

Taxonomic								#		
Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	recs	Distance (km)	Prov
Р	Eriophorum russeolum	Russet Cottongrass				S3S4	4 Secure	212	2.0 ± 0.0	NB
Р	Triglochin gaspensis	Gasp ⊢⊢ Arrowgrass				S3S4	4 Secure	68	23.3 ± 0.0	NB
Р	Spirodela polyrrhiza	Great Duckweed				S3S4	4 Secure	14	30.5 ± 0.0	NB
Р	Corallorhiza maculata	Spotted Coralroot				S3S4	3 Sensitive	16	22.3 ± 5.0	NB
Р	Calamagrostis stricta	Slim-stemmed Reed Grass				S3S4	4 Secure	26	17.4 ± 2.0	NB
Ρ	Calamagrostis stricta ssp. stricta	Slim-stemmed Reed Grass				S3S4	4 Secure	7	$35.2 \pm 0.0$	NB
Р	Calamagrostis stricta var. stricta	Slim-stemmed Reed Grass				S3S4	4 Secure	9	$63.3 \pm 0.0$	PE
Р	Distichlis spicata	Salt Grass				S3S4	4 Secure	91	17.0 ± 5.0	NB
Р	Potamogeton oakesianus	Oakes' Pondweed				S3S4	4 Secure	14	$4.5 \pm 0.0$	NB
Р	Montia fontana	Water Blinks				SH	2 May Be At Risk	4	17.4 ± 1.0	NB
Р	Agalinis maritima	Saltmarsh Agalinis				SX	0.1 Extirpated	2	74.7 ± 50.0	NB

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APPENDIX D

FUNCTIONAL ASSESSMENT

Assessment Area (AA) Results:															
Wetland ID: 1															
Date: June 16, 2018															
Observer: Theo Popma															
Latitude & Longitude (decimal degrees): 44.692457°; -66.750	762°														
Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.											New Brunswick	Reference Scor	ïes		
Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)	Min	Max	Range	F_JenksLo	F_JenksHigh	Min Max	Range	B_JenksLo	B_JenksHigh
Water Storage & Delay (WS)	2.51	Moderate	0.44	Lower	3.66	0.53	1.73	9.42	7.68	2.48	5.12	0.08 10.00	9.92	2.58	5.67
Stream Flow Support (SFS)	6.35	Moderate	3.61	Moderate	3.39	2.10	0.00	5.33	5.33	2.92	6.56	0.00 5.83	5.83	2.08	6.16
Water Cooling (WC)	7.10	Higher	3.91	Moderate	4.73	2.35	0.00	6.67	6.67	1.80	5.30	0.00 6.02	6.02	1.45	4.79
Sediment Retention & Stabilisation (SR)	3.04	Moderate	6.77	Moderate	5.24	4.11	3.16	10.00	6.84	1.76	5.26	0.00 6.07	6.07	3.75	7.95
Phosphorus Retention (PR)	3.01	Moderate	6.27	Higher	5.04	6.00	2.90	10.00	7.10	2.66	4.17	0.33 9.38	9.04	1.71	4.55
Nitrate Removal & Retention (NR)	2.82	Moderate	10.00	Higher	5.57	10.00	3.83	10.00	6.17	2.27	4.36	1.11 10.00	8.89	2.50	7.19
Carbon Sequestration (CS)	4.54	Moderate			6.52		4.56	8.88	4.31	3.13	5.70				
Organic Nutrient Export (OE)	7.04	Higher			6.07		2.33	7.64	5.30	3.12	5.26				
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00	0.00	6.13	6.13	1.80	6.71	0.00 7.39	7.39	0.00	4.44
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00	0.00	5.95	5.95	1.40	6.29	0.00 7.09	7.09	0.00	4.48
Aquatic Invertebrate Habitat (INV)	6.93	Higher	4.92	Moderate	6.31	3.89	3.87	7.39	3.52	2.58	5.58	1.24 6.64	5.39	0.85	5.74
Amphibian & Turtle Habitat (AM)	5.93	Moderate	6.40	Higher	6.44	5.97	3.30	8.58	5.28	3.30	6.25	2.09 8.16	6.06		6.30
Waterbird Feeding Habitat (WBF)	6.37	Moderate	5.00	Moderate	5.07	5.00	0.00	7.96	7.96	0.00	6.84	0.00 10.00	10.00	0.83	6.67
Waterbird Nesting Habitat (WBN)	4.69	Moderate	5.00	Moderate	4.01	5.00	0.00	8.54	8.54	1.95	5.42	0.00 10.00	10.00	0.00	6.67
Songbird, Raptor, & Mammal Habitat (SBM)	9.48	Higher	5.00	Moderate	7.86	5.00	0.00	8.29	8.29	2.50	7.24	0.00 10.00	10.00		6.67
Pollinator Habitat (POL)	9.16	Higher	3.33	Moderate	7.38	3.33	0.00	8.05	8.05	0.00	7.81	0.00 10.00	10.00	0.00	6.67
Native Plant Habitat (PH)	7.83	Higher	7.13	Higher	6.24	6.19	3.08	7.12	4.03	3.96	5.98	0.00 8.68	8.68	0.00	6.33
Public Use & Recognition (PU)			1.56	Lower		1.44						0.33 7.44	7.11	2.40	5.51
Wetland Sensitivity (Sens)			3.54	Moderate		3.26						2.20 5.20	2.99	2.88	5.30
Wetland Ecological Condition (EC)			8.55	Higher		9.17						4.24 10.00	5.76	3.25	6.39
Wetland Stressors (STR) (higher score means more stress)			0.08	Lower		2.29						2.26 5.93	3.67	2.15	4.97
Summary Ratings for Grouped Functions:															
HYDROLOGIC Group (WS)	10.00	Higher	0.44	Lower	3.66	0.53				2.48	5.12			2.58	5.67
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	3.00	Lower	8.84	Higher	6.05	8.35				3.07	5.39			4.15	7.64
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	6.98	Higher	4.53	Moderate	5.72	3.34				3.82	6.04			1.34	4.99
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	4.88	Moderate	4.84	Moderate	4.77	4.58				2.41	6.22			3.15	6.29
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	9.15	Higher	6.14	Higher	7.51	5.52				4.68	7.60			0.00	5.33
WETLAND CONDITION (EC)			8.55	Higher		9.17								3.25	6.39
WETLAND RISK (average of Sensitivity & Stressors)			1.81	Lower		2.78								2.71	4.33
NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.															

### **APPENDIX E**

PHASE VI EIA APPROVAL & TENTATIVE PLAN



December 15, 2016

File Number 4561-3-1289

Mr. Jacques Martin 60 King St. Moncton, NB E1C 4M2

Dear Mr. Martin:

### RE: EIA #4561-3-1289 - Domain Nature Estates Subdivision (phase 6).

Members of the Technical Review Committee (TRC) have completed their review of the proposed addition of phase 6 in Domain Nature Estates Subdivision (EIA# 4561-3-1289). This letter hereby constitutes **approval to proceed with phase 6 of the subdivision development** however; please note that approval to proceed is contingent upon the following:

- 1. The proponent is subject to the conditions as outlined in the *Certificate of Determination* for EIA 4561-3-1289.
- 2. The cumulative total number of lots including all phases cannot exceed the 88 lots that were originally proposed.
- 3. The proponent must add a restrictive covenant prior to selling any of the remaining lots within the development prohibiting the use of groundwater sourced (i.e. open loop) earth energy systems. Closed loop earth energy systems are permitted provided that they are constructed in accordance with the requirements of the most current version of CSA standard C448.2 Design and Installation of Earth Energy Systems for Residential and Other Small Buildings as well as the National Building Code.
- 4. The proponent shall include a disclosure statement during the sale of all future lots informing the buyer of the possible need for water treatment so that they are made aware of any potential water quality issues and can plan for the expense.
- 5. The proponent must comply with all other acts and regulations.

If you require further information or have any questions please do not hesitate to contact me at (506) 444-3382 or crystale.harty@gnb.ca.

Sincerely,

Crystale Harty, B.Sc. Oroject Manager, Environmental Assessment Section, DELG

C. Mr. Michael Fisher, Fisher Engineering Ltd. Technical Review Committee



APPENDIX F

WSSA APPLICATION

### Water Supply Source Assessment Step One Application Domain Nature Estates Subdivision Expansion, Greater Lakeburn. NB

#### Pursuant to Section 3(5) of The Water Quality Regulation 82-126 Clean Environment Act

#### Please answer the following questions:

1) Name of proponent: 690763N.B Ltd.

#### 2) The proposed water supply is to be used for what purpose?

Individual wells will provide potable water to the proposed 80 additional residential building lots.

#### 3) Required water quantity (in m<sup>3</sup>/day):

The estimated water requirement for the proposed 80 lots is 108 m<sup>3</sup>/day (16.5 igpm), which is based on a per person water usage of 450 litres per day and an average of 3 people per household, which is higher than the 2016 census data for New Brunswick that has an average household size of 2.3.

#### 4) List alternate water supply sources in area (including municipal systems):

The surrounding areas rely on individual wells to provide groundwater for their potable water supply. The nearest municipal system (City of Dieppe) infrastructure ends approximately 4 km from the site. There are no plans to extend the infrastructure to the area.

#### 5) Outline proposed work schedule:

The exploration program will consist of drilling test wells at strategic locations across the property and performing pump test(s). five test wells will be drilled during the winter of 2019 (TW17-1 through TW17-5). The proposed drilling sites are shown on the attached figure. The proposed well locations have been placed outside the mapped wetland area on the property.

If conditions permit (i.e. minimal recharge conditions) a 72 hr pump test will be performed in the winter of 2019. The intent is to pump TW17-2 and monitor the response in the surrounding test wells. A step-test (three 0.5 hour steps) will be completed at the beginning of the long-term test to determine the optimum pumping rate. Depending on the response from the observation wells during the 72 hr test, an additional pump test may be required to characterize the surrounding aquifer across the site. Reporting will be completed once the long-term pumping test is performed.

#### 6) Discuss area hydrogeology as it relates to the project requirements:

The regional bedrock geology is mapped as late Carboniferous stratified rock belonging to either the Cumberland or Pictou Groups, which are both a subbasin of the Maritimes Carboniferous Basin. Mapping indicates that within the Cumberland Group the site may fall within the Boss Point Formation, which consists mainly of fine-grained to granular sandstone, siltstone, and mudstone (Rivard et al. 2003). Within the Pictou Group, the site may fall within the Salisbury Formation, which consists mainly of mudstone, siltstone and fine-grained sandstone (Rivard et al. 2003).

The Boss Point Formation has been described as one of the more productive sandstone formations in the province (Carr, 1959) while the Salisbury Formation varies from a good to poor aquifer throughout the Moncton basin. The majority of the domestic wells drilled in this formation generally yield 10 igpm (Carr, 1959).

Available domestic well logs from within a 500m radius of the site are summarized in the attached Table 1. Well yields range from 33 to 262 m<sup>3</sup>/day (5.1 to 40.1 igpm) with a median yield of 98 m<sup>3</sup>/day (15 igpm). Well depths range from 18.3 to 79.6 m.

Professional experience in the area from previous hydrogeological studies have produced results stating "In our professional opinion, the drilling and hydraulic testing activities indicate that groundwater withdrawals from the proposed subdivision will not exceed the long-term safe yield of the aquifers and will not aggravate existing or create new water supply problems for existing users in the area. The majority of the residents of the subdivision are likely to obtain safe well yields greater than 5 igpm from their wells, which easily meets the individual household / lot requirements of 1.53 m<sup>3</sup>/day or 0.234 igpm on a continuous basis.

7) Identify any existing pollution or contamination hazards within a (minimum) 500 m radius of the proposed drill targets. If groundwater use problems (quantity or quality) have occurred in the past, then these should be identified. Historical land use that might pose a contamination hazard (i.e. tannery, industrial, disposal, etc.) should also be flagged:

Approximately 25 residential properties are located within a 500 m radius of the development. There do not appear to be any potential sources of contamination on adjacent properties that would be considered up gradient from the site. Historically the site was vacant and forested.

Water quality in the area overall is generally good. Elevated levels of iron, fluoride and pH have been encountered at concentrations above their Health Canada drinking water guidelines in groundwater wells within 1km of the subject property. Groundwater samples will be collected during the pumping test and analyzed for the potable water package as recommended in the WSSA guideline. Current restrictions within the existing subdivision include no open looped geothermal systems. This condition will be carried through to the extension.

Within the existing subdivision, a caution note has been added to the final subdivision plans that states: "Based on a comprehensive water supply assessment prepared by Fisher Engineering Ltd. a residential water treatment unit may be required to ensure water quality within the Guidelines for the Protection of Canadian Drinking Water Quality." It is highly likely that this note will continue to be added to future phases within this expansion.

## 8) Identify any watercourse(s) (stream, brook, river, wetland, etc.) within 30 m of the proposed drill targets.

There are no watercourses or mapped wetlands within 30 m of any of the proposed drill targets. GeoNB mapping was used to assist in locating the proposed drill targets so that they would be outside the 30metre buffer.

# 9) Identify site supervisory personnel involved in the source development (municipal officials, consultants and drillers):

The source development consultant is FISHER ENGINEERING LTD.

#### 10) Attach a 1:10000 map and/or recent air photo clearly identifying the following:

- proposed drill targets
- domestic or production wells within a 500 m radius from the drill target
- any potential hazards identified in question 7

Refer to the attached Figure.

# 11) Attach a land use / zoning map of the area (if any). Superimpose drill targets on this map.

The proposed development falls within the Southeast Regional Service Commission Planning Area. The subject property and surrounding land is currently zoned Rural Agricultural (Zone A), which permits single unit residential dwellings.

#### Enclosures

PC008/Water Supply Source Assessment Application.doc



Project:

## EIA REGISTRATION NATURE ESTATES EXPANSION

Drawing:

## SITE PLAN SHOWING PROPOSED WELL LOCATIONS

Project No.: PC008												
Drawing No.: PC00802 Revision No.: 0												
Scale: 1 - 5000												
Drawn By: ACB	Checked By: MJF		Date: Dec. 18									
E FISHER Lowe	ENGINEERING ENGINEERING AO Fairfield R r Coverdale, New E1J 0A2	ERI coad w Bru	NG LTD. unswick									

Well Report	Well	Casing	Rock	Yield	Rock Type
	Ĺ	Depths (n	n)	m3/day	
12046	73.5	54.9	14.3	114	Sandstone
12053	79.6	39.0	12.2	42	Sandstone
17125	48.8	24.4	21.0	98	Sandstone
90022730	54.9	18.3	18.0	98	Sandstone
91409500	18.3	6.1	5.8	131	Sandstone
90525200	43.9	11.0	27.4	33	Sandstone
14243	54.9		2.1	79	Sandstone
24072	36.8	13.1	12.8	66	Sandstone
24073	48.8	15.9	8.8	33	Sandstone
24372	34.1	11.0	4.6	196	Sandstone
24373	27.4	11.6	10.7	196	Sandstone
29004	29.0	13.7	4.9	131	Shale
29005	29.0	12.8	4.3	52	Sandstone
29006	29.0	15.8	4.3	52	Sandstone
30153	32.0	6.7	2.4	262	Sandstone
30154	30.5	6.1	4.3	196	Sandstone
35361	27.4	6.1	5.2	98	Sandstone
35378	42.7	23.5	12.2	65	Sandstone
35415	42.7	35.4	9.1	98	Sandstone
36280	36.6	9.1	7.3	46	Sandstone
36547	42.7	37.5		98	Sandstone
36618	42.7	21.3	7.3	46	Sandstone
36713	36.6	30.5	0.6	229	Sandstone
36816	24.4	8.5	0.9	65	Sandstone

Well Log Summary 500m Radius for PID 70473947

Max	79.6	54.9	27.4	262
Min	18.3	6.1	0.6	33
Average	40.2	18.8	8.7	105
Median	36.7	13.7	7.3	98

Parameter	CCME DWQG	unit										Sample					
Aluminum		mg/L	0.27	<0.025	0.03	0.003	0.243	0.395	<0.025	0.09	0.044	<0.025	0.18	<0.025	0.003	0.06	0.3
Alkanity		mg/L	236	227	245	190	212	210	233	213	229	160	148	174	190	210	164
Arsenic	10	µg/L	2.3	1.9	2	<1	8.4	2.9	<1.5	1.7	<1.5	1.8	<1.5	1.7	<1.5	2	4.3
Boron	5	mg/L	0.131	0.124	0.116	0.06	<0.2	<0.2	0.084	0.095	0.084	0.056	0.037	0.058	0.06	0.085	0.09
Barium	1	mg/L	0.022	0.013	0.015	0.323	0.041	0.066	0.022	0.01	0.036	0.035	0.119	0.047	0.323	0.01	0.022
Bromine	10	mg/L	<0.1	<0.1	<0.1		0.753	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
Calcium		mg/L	1.06	0.9	1.51	16.8	2.9	1.4	1.2	1.32	1.3	4.07	7.41	3.53	16.8	1.28	1.15
Cadmium	5	µg/L	<0.5	<0.5	<0.5	<0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloride	250	mg/L	34.1	3.28	17.3	32.7	94	21.4	3.03	3.51	3.81	3.59	3.88	3.23	32.7	3.58	10
Conductivity			571	440	566	453	778	502	448	416	452	313	305	332	453	426	350
Chromium	50	µg/L	21	18	<10	<1	12	20	<10	<10	<10	<10	<10	<10	<10	<10	<10
Copper	1000	µg/L	<10	<10	<10	26	10	61	<10	<10	<10	<10	<10	<10	26	<10	<10
E-coli			Ab	Ab	Ab	Ab			Ab      Ab								
Floride	1.5	mg/L	5.38	3.42	7.49	0.36	6.51	3.91	1.87	6.03	2.09	0.519	0.371	0.555	0.36	3.82	2.22
Iron	0.3	mg/L	0.12	0.166	0.242	0.03	0.178	1.281	0.039	0.206	0.25	0.013	0.168	0.095	0.03	0.629	0.615
Hardness		mg/L	2.91	2.42	4.03	47.6	7.7	4.3	3.19	3.59	3.5	11.8	20.9	9.76	47.6	3.61	3.45
Potassium		mg/L	0.7	0.2	0.3	1.38	0.475	0.47	0.3	0.3	0.4	0.6	0.8	0.7	1.38	0.3	0.4
Magnesium		mg/L	<0.1	<0.1	<0.1	1.38	0.1	0.2	<0.1	<0.1	<0.1	0.4	0.58	0.23	1.38	<0.1	0.14
Mangnesium	0.05	mg/L	0.01	0.011	0.013	0.07	0.013	0.024	0.008	0.015	0.017	0.02	0.04	0.045	0.007	0.015	0.008
Sodium	200	mg/L	129	105	138	87.3	158	116	111	114	116	76.4	67.7	76	87.3	98	81.8
Nitrite		mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	< 0.05	<0.05		<0.05	<0.05
Nitrate	45	mg/L	< 0.05	<0.05	<0.05	< 0.05	<0.05	< 0.05	< 0.05	<0.05	< 0.05	<0.05	< 0.05	<0.05	< 0.05	<0.05	< 0.05
Nitrite + Nitrate		mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	< 0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead	10	µg/L	<1	<1	<1	0.2	1.9	3	<1	<1	<1	<1	<1	<1	0.2	<1	<1
рН	6.5-9.0		9.15	9.2	9.14	8.2	8.91	9.16	9.08	8.95	9.14	8.87	8.67	8.46	8.2	9.03	9.27
Antimony	6	µg/L	<1	<1	<1	<0.1	1.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium	10	µg/L	<1.5	<1.5	<1.5	<0.001	3.1	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1	<1.5	2.4
Sulphate	500	mg/L	3.46	4.64	6.38	7	17	5.3	0.699	8.62	5.94	5.78	5.24	5.95	7	5.6	3.18
TDS	500	mg/L	316	254	319	263			258	262	268	188	176	195	263	240	199
Titanium		µg/L	<1	<1	<1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Turbidity	1	µg/L	10.1	3.4	2.9	0.4	16	21.3	0.52	2.6	2.6	0.2	5.4	0.9	0.4	7	10
Uranium	20	µg/L	<0.5	<0.5	<0.5	0.7			<0.5	<0.5	<0.5	<0.5	0.6	<0.5	0.7	<0.5	2.5
Zinc	5000	µg/L	<5	<5	<5	55	16	11	<5	<5	<5	<5	<5	5	55	<5	<5

#### NBDELG Water Quality Results, 1 km Radius of PID 70473947

CCME - Canadian Council of Ministers of the Environment

DWQG - Drinking Water Quality Guidelines.

Value does not meet applicable guideline