

# St. George Water Supply Development Preliminary EIA Registration Document

162865.00 • Report • October 2017




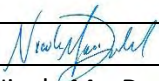

**Environment and Local Government**  
GNB Home

Prepared for:



Prepared by:



			
Issued to NBDELG for Review	Ian Bryson	Oct/25/2017	Nicole MacDonald
<b><i>Issue or Revision</i></b>	<b><i>Reviewed By:</i></b>	<b><i>Date</i></b>	<b><i>Issued By:</i></b>
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**CBCL LIMITED**

Consulting Engineers

October 25<sup>th</sup>, 2017

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Dear Mr. Doucet:

*RE: St. George Water Exploration – EIA Registration Document*

CBCL Limited is pleased to submit this Preliminary Environmental Impact Assessment (EIA) Registration document for the exploration of a proposed groundwater supply site in St. George, NB.

Once you have reviewed the information provided, please do not hesitate to contact me with any questions or comments. Following your comments, the report will be updated.

Yours very truly,

CBCL Limited

Submitted

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tomorrow  
in mind**



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## CHAPTER 1 INTRODUCTION

### 1.1 Name of the Project

St. George Water Supply Development, St. George, NB

### 1.2 Project Overview

The Town of St. George, NB is seeking to augment and improve its existing groundwater supply system. The existing network of wells is adequate to supply the Town's existing demand, but due to limited well performance and anticipated potential increased demand from commercial/industrial customers, the Town is seeking to improve redundancy and investigate the potential for improved capacity.

The Project is subject to a provincial EIA pursuant to Schedule A, undertaking "s", of the *Environmental Impact Assessment Regulation (87-83)* of the *Clean Environment Act*. Undertaking "s" states that all waterworks with a capacity greater than fifty cubic metres of water daily require EIA registration. The province of New Brunswick has developed the *Water Supply Source Assessment (WSSA)* process for groundwater source development projects requiring an EIA. The WSSA process has been developed to evaluate the sustainability of the water supply, to assess the water quality, and to evaluate potential impacts to existing water users. The WSSA process is initiated by the submission of EIA Registration document, and a WSSA Initial Application and Hydrogeological Assessment. The initial WSSA application was submitted to the New Brunswick Department of Environment and Local Government (NBDELG) in September 2017 and is included in Appendix A.

### 1.3 Background Information

CBCL completed a feasibility study to identify potential options to increase production from the rates as indicated by usage data. Options included the installation of new wells in the existing Magaguadavic and Lake Utopia aquifers, or in other mapped deposits of granular material further to the south within the Town boundaries. The feasibility study included a thorough review of reporting on a 3D groundwater flow model of the area (Stantec, 2012). Other study tasks included review and establishment of site selection criteria, identification and mapping of potential contaminant sources,

site reconnaissance, and conceptual modelling to evaluate the potential catchment for potential well locations. Relevant information was summarized in the WSSA Initial Application (Appendix A).

Geotechnical work was completed as a follow-up to the feasibility study. Seven boreholes were advanced to show the depth and thickness of granular material at each location, and to identify confining units. In cases where granular material was encountered, a monitoring well was installed to allow for collection of a water sample. Six boreholes were advanced using continuous split spoons and augers. The seventh borehole, completed in the Magaguadavic aquifer, was advanced as a 150mm diameter (6”) cased borehole owing to the depth and nature of the material encountered. Figure 2.1 shows the locations of these boreholes. Borehole logs can be provided upon request.

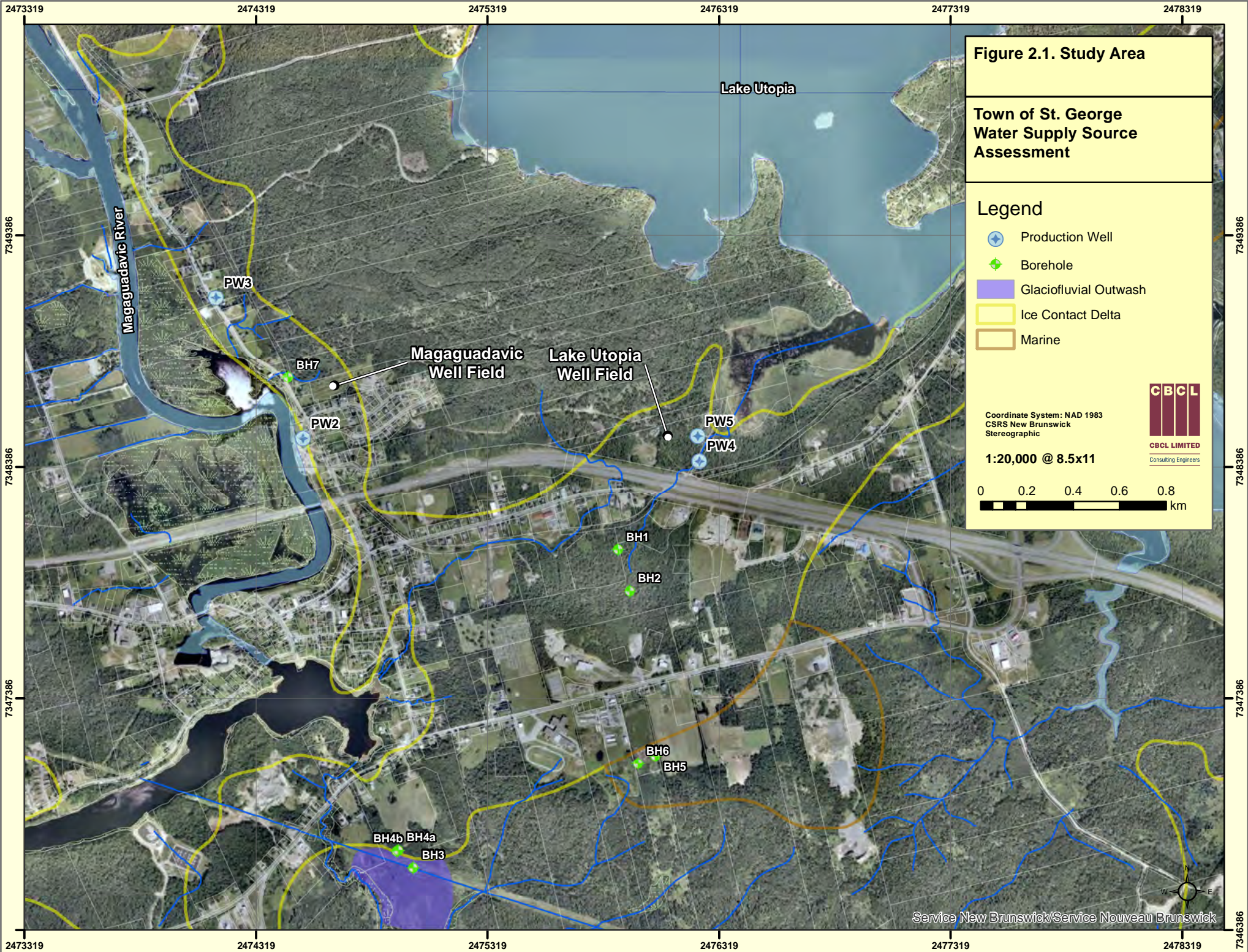
## 1.4 The Proponent

**Table 1.1: Proponent Information**

<b>Project Name</b>	St. George Water Supply Development
<b>Project Location</b>	St. George, New Brunswick
<b>Proponent</b>	Town of St. George 1 School Street St. George, NB E5C 3N2
<b>Proponent Contact Person</b>	Jane Lee Acting Chief Administrative Officer Telephone: (506) 755-4321 Fax: (506) 755-4329 Email: jane.lee@town.stgeorge.nb.ca
<b>Consultant</b>	CBCL Limited 14 King Street, Suite 420 PO Box 20040 Saint John, NB E2L 5B2
<b>Consultant Contact Person</b>	Amy Winchester, M.A.Sc., P.Eng. Project Manager Telephone: (506) 633-6650 Fax: (506) 633-6659 Email: <a href="mailto:amyw@cbcl.ca">amyw@cbcl.ca</a>

## 1.5 Funding

The pump testing, reporting and any investigative work will come from Town’s capital funds. The Town will be applying for funding through various funding programs to cover the expenses related to the well development and distribution system connections.



**Figure 2.1. Study Area**

**Town of St. George  
Water Supply Source  
Assessment**

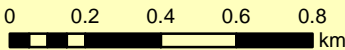
**Legend**

-  Production Well
-  Borehole
-  Glaciofluvial Outwash
-  Ice Contact Delta
-  Marine

Coordinate System: NAD 1983  
CSRS New Brunswick  
Stereographic



1:20,000 @ 8.5x11





## CHAPTER 2 **PROJECT DESCRIPTION**

### **2.1 Project Scope**

As previously mentioned, the Town of St. George aims to investigate the potential to locate a new groundwater source, and to improve access to groundwater allocated under the current 'Approval to Operate'.

### **2.2 Need for Project**

The existing wells are relatively shallow in nature and the water table is only a few meters above the pumps in the Lake Utopia zone. The Town's primary industrial client has been increasing their demand, resulting in a strain on water supply. In combination with low Lake levels, the water level in the existing wells and recharge rates have been low.

It has been identified that the Town's industry would like to grow and therefore capacity to withdraw additional water is needed. With the currently low groundwater levels in the Lake Utopia aquifer, the Town is seeking to construct another well source in the Magaguadavic Aquifer to be able to supply the Town's growing needs.

### **2.3 Project Location**

The study area is located in St. George, NB. Figure 2.1 shows the study area, including existing well fields and the proposed location of testing. Well testing work would be completed on PID 15101017.

### **2.4 Siting Considerations**

The proposed test site is located within the Magaguadavic Aquifer, a linear deposit of sand and gravel associated with the Magaguadavic River Valley. There are two active production wells within this aquifer; existing aquifer tests and 3D numerical modelling have demonstrated the aquifer yield and a regional water budget. The Town of St. George operates these wells under an existing permit, but due to age and declining well performance, the aquifer is underutilized. A new well in this aquifer would allow extraction rates to approach those as outlined in the Town's operating permit and the existing numerical model.

The proposed test site was selected according to the following considerations:

- The test site is located within a known aquifer with reasonably well defined boundaries;
- There are no anticipated contaminant sources or land uses of concern within 500 metres of the proposed drilling site;
- Several homes in the area may be heated using domestic fuel oil tanks, however, these homes fall within the existing source water area of two of the Town's existing wells;
- The Magaguadavic River is greater than 60 metres from the proposed location, and mapping shows a stream approximately 15 metres to the north of this location;
- Site reconnaissance and the presence at surface of a clay confining unit suggests that interaction of the confined aquifer with this water course would likely be minimal.

The proposed test site is located within the existing source water protection area, shown on Figure 2.2. This demonstrates that source water issues have been addressed, but that cumulative interference between the new site and existing wells must be assessed. Previous work indicates that pumping from a new well will not exceed the water budget / permitted extraction rates for the aquifer.

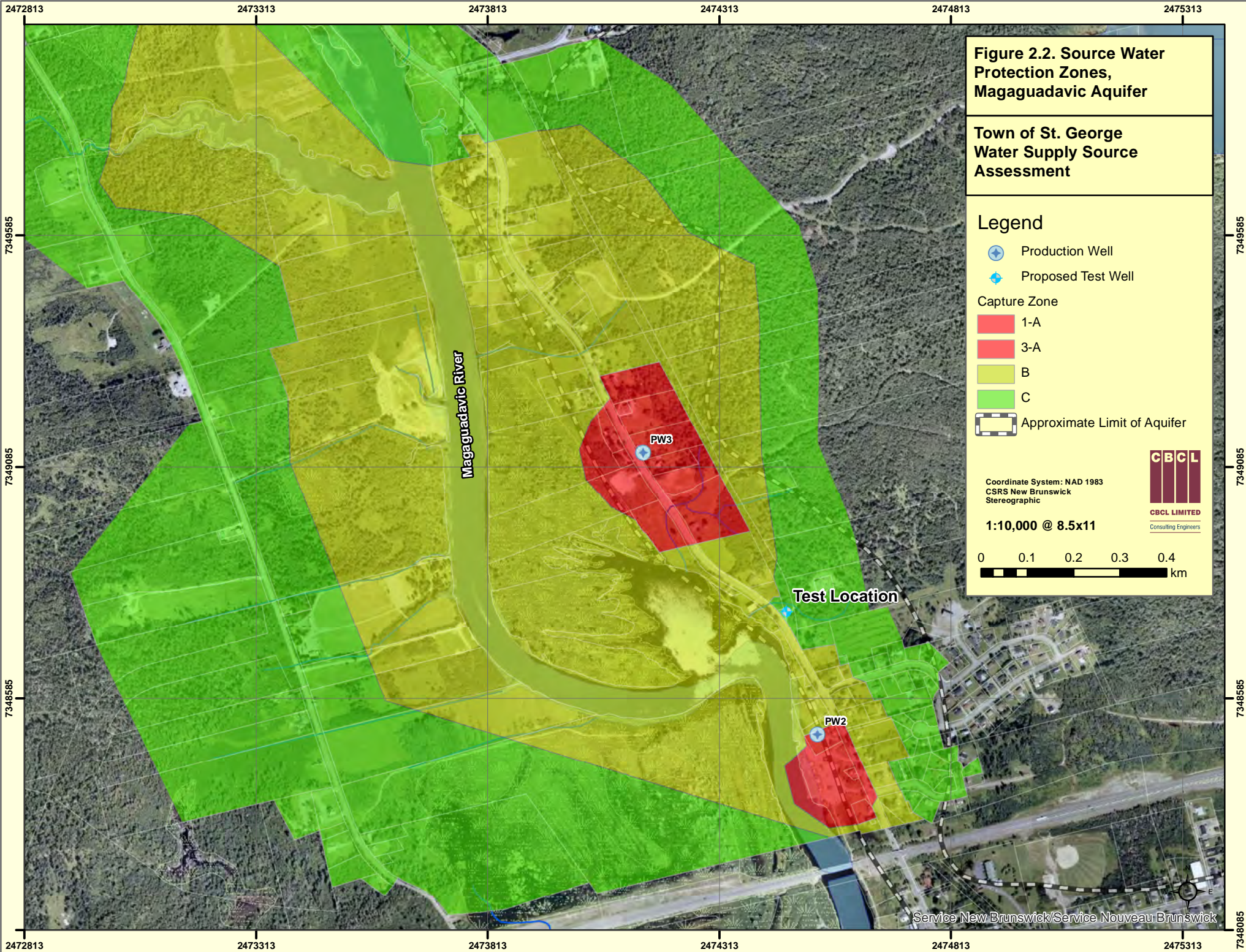
## **2.5 Project Alternatives**

Numerous alternative sites were investigated as part of a preliminary desk-top investigation, including several follow-up geotechnical boreholes (borehole locations shown on Figure 2.1). Areas were targeted according to geology mapping, topographic features, hydrogeologic setting, transmission and distribution logistics, land availability and access, and potential sources of contamination. All sites were within the Town boundaries. As each of these sites showed poor potential for development, an additional well in the Magaguadavic aquifer is considered to be the final viable alternative. Other sites further from the Town and distribution system would not be cost-effective, and would introduce administrative issues and significant costs associated with connecting to the current distribution system, if located outside of the Town boundaries.

## **2.6 Project Schedule**

A proposed schedule of work is as follows, pending the timing for approval to proceed.

- November 2017 - data loggers deployed and surface water monitoring stations established;
- November 2017 - step test completed, including four steps and recovery and water quality sample at end of fourth step;
- November/December - pending the results of the step test, a fully screened well will be constructed at the test site;
- December 2017 - 72-hour aquifer test of new production well, including water quality samples;
- December 2017 - brief summary of preliminary results will be provided to NBDELG;
- December 2017 - reporting of aquifer testing results.



**Figure 2.2. Source Water Protection Zones, Magaguadavic Aquifer**

**Town of St. George Water Supply Source Assessment**

**Legend**

- Production Well
- Proposed Test Well

**Capture Zone**

- 1-A
- 3-A
- B
- C

Approximate Limit of Aquifer

Coordinate System: NAD 1983  
 CSRS New Brunswick  
 Stereographic

**1:10,000 @ 8.5x11**

0 0.1 0.2 0.3 0.4 km

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## 2.7 Project Components

CBCL completed a feasibility study to identify potential options to increase production from the rates as indicated by usage data. Options included the installation of new wells in the existing Magaguadavic and Lake Utopia aquifers, or in other mapped deposits of granular material further to the south within the Town boundaries. The feasibility study included a thorough review of reporting on a 3D groundwater flow model of the area (Stantec, 2012). Other study tasks included review and establishment of site selection criteria, identification and mapping of potential contaminant sources, site reconnaissance, and conceptual modelling to evaluate the potential catchment for potential well locations. Relevant information was summarized in the WSSA Initial Application (Appendix A).

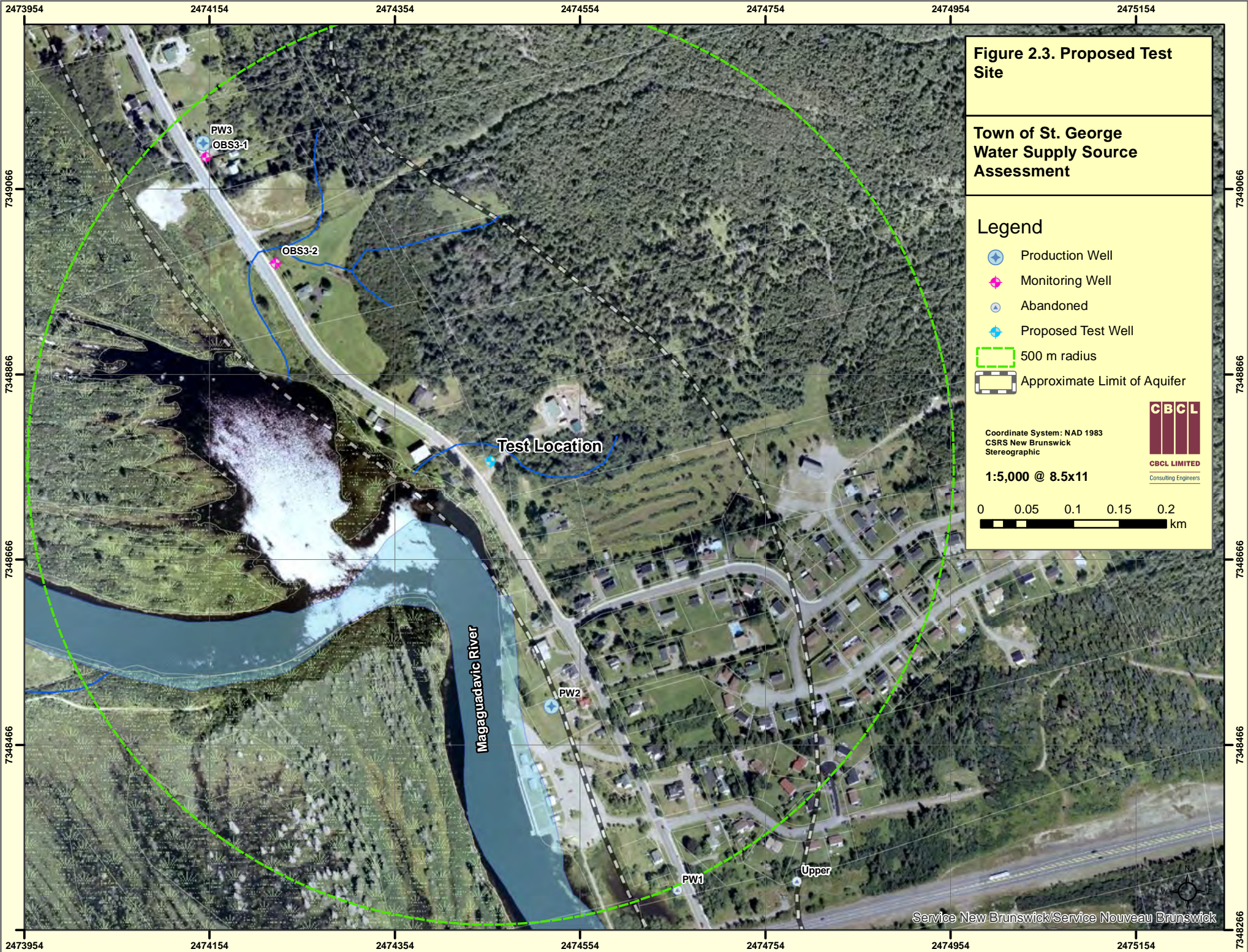
Geotechnical work was completed as a follow-up to the feasibility study. Seven boreholes were advanced to show the depth and thickness of granular material at each location, and to identify confining units. In cases where granular material was encountered, a monitoring well was installed to allow for collection of a water sample. Six boreholes were advanced using continuous split spoons and augers. The seventh borehole, completed in the Magaguadavic aquifer, was advanced as a 150mm diameter (6") cased borehole owing to the depth and nature of the material encountered. Figure 2.1 shows the locations of these boreholes. Additional reporting on this preliminary geotechnical work is available upon request.

Borehole BH7 showed a 7 to 10 metre thick unit of sand and gravel overlain by a confining unit of marine clay. This setting is consistent with the results of previous drilling in the Magaguadavic aquifer. The Town wishes to pursue the possibility of installing a redundant well in the Magaguadavic aquifer, near the location of borehole BH7. The targeted pumping rate of a redundant well in this aquifer is up to 1310 m<sup>3</sup>/d (200 igpm). The addition of this well would help the Town to achieve pumping rates closer to the permitted capacity of the aquifer. We propose to use the existing borehole BH7 to complete a step test and collect water quality samples. Background water levels in the borehole would furthermore be monitored for one month using a data logger, to show any responses to pumping at PW2 and PW3. The results of this work would inform a decision on whether to proceed with a fully screened 20mm – 250mm (8" to 10") diameter production well, and an associated comprehensive aquifer testing program.

Figure 2.3 shows the proposed test site and nearby features, including two active production wells and two observation wells. Monitoring for initial well testing would consist of the following:

- Continuous measurement of water levels using the Town's SCADA system in the existing production wells before, during, and after test;
- Continuous measurement of water levels in observation wells using data loggers;
- Continuous measurement of water levels in the Magaguadavic River using a stilling well and data logger;
- Continuous measurement of water levels in the stream using a stilling well, minipiezometer, and data loggers (pending the presence of surface water).







Water discharged during the step test will be controlled and allowed to filter overland into the local stream, downstream of the monitoring location. Discharged water will be monitored and if



**Figure 2.3. Proposed Test Site**

**Town of St. George  
Water Supply Source  
Assessment**

**Legend**

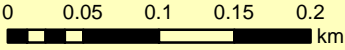
-  Production Well
-  Monitoring Well
-  Abandoned
-  Proposed Test Well
-  500 m radius
-  Approximate Limit of Aquifer

Coordinate System: NAD 1983  
 CSRS New Brunswick  
 Stereographic



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**1:5,000 @ 8.5x11**



necessary filtered using hay bales and/or a silt curtain to ensure that suspended solids are not discharged to the stream.

## **2.8 Construction Methods**

There are no works to be constructed for the proposed step test. Surface water monitoring stations will consist of 25mm diameter (1") PVC machine slotted pipe, to be installed by hand. Pipes may be anchored to an angle iron as needed. If work proceeds to installation of a screened production well, work will be completed by a licensed water well driller, and proceed as per the *Water Well Regulations*. A typical well in the Magaguadavic aquifer would include one or more three to five metre length of stainless steel screen with a natural filter pack, a bail-bottom, and a solid steel casing. The surface casing would be pressure grouted over the thickness of the clay confining unit.

## **2.9 Environmental Management**

The objective of environmental management is to implement safe and environmentally responsible practices. The Town is committed to articulate and adhere to systems, procedures, practices and materials that will ensure the development and operation of the Project is executed in a manner that protects the environment and facilitates the safety of all who work on, or visit the site. The principle components of an environmental management system include the preparation of the following:

- Environmental Protection Plan (EPP);
- Environmental compliance and effects monitoring plan; and
- Emergency response and contingency plan.

The intent of the environmental management system is to:

- Define environmental, health and safety responsibilities and accountabilities for personnel;
- Ensure compliance with regulations, goals and objectives;
- Establish minimum standards for a contractor safety and the implementation of environmental protocols in the field;
- Establish safe work practices and procedures documentation that ensure basic precautions for preventing accidents, injuries or illnesses in the performance of work;
- Define environmental practices and procedures that establish minimum standards for all operations that have a potential to cause environmental problems;
- Define minimum safety training standards to ensure that all personnel are aware of potential Hazards and know safe work practices and emergency procedures; and
- Establish an accident/incident reporting system that standardizes prompt reporting of all injuries and environmental incidents.

### **2.9.1 Environmental Protection Plan (EPP)**

The EPP will be developed in consultation with relevant provincial agencies and will be completed prior to work; it will outline specific environmental and engineering measures that will be employed during Project work (e.g., the deployment of techniques to control erosion and sedimentation and measures to prevent spills of hazardous materials). The EPP will expand upon measures identified in

this environmental assessment report and will accommodate recommendations from the regulatory authorities. These requirements will be brought to the attention of all personnel working on the site, including contractors.

### **2.9.2 Environmental Compliance and Effects Monitoring Plan**

Figure 2.3 shows the proposed test site and nearby features, including two active production wells and two observation wells. Monitoring for initial well testing would consist of the following:

- Continuous measurement of water levels using the Town's SCADA system in the existing production wells before, during, and after test;
- Continuous measurement of water levels in observation wells using data loggers;
- Continuous measurement of water levels in the Magaguadavic River using a stilling well and data logger;
- Continuous measurement of water levels in the stream using a stilling well, minipiezometer, and data loggers (pending the presence of surface water).

Water discharged during the step test will be controlled and allowed to filter overland into the local stream, downstream of the monitoring location. Discharged water will be monitored and if necessary filtered using hay bales and/or a silt curtain to ensure that suspended solids are not discharged to the stream.

### **2.9.1 Emergency Response and Contingency Plan**

The goal of the Emergency Response and Contingency Plan is to reduce the frequency, extent and duration of accidental events and to reduce the risk to the environment and public safety from such events. This plan will be developed in consultation with relevant provincial agencies for both the construction and operation of the Project. The plan will designate personnel responsible for specific actions, and ensure that an effective communications and reporting system is in place.

## CHAPTER 3 **REGULATORY FRAMEWORK**

### **3.1 General**

The following sections detail the likely regulatory permitting and approval requirements to which the proposed groundwater infrastructure project will be subject. It also details the environmental legislation and regulations to which the proponent and contractors must comply with during construction activities. The review is based on current legislation; any future amendments to existing legislation may modify permitting and approval requirements for the Project. The permitting and approvals processes described below are not exhaustive and represent the more significant regulatory requirements. Additional permitting and approval requirements may exist.

### **3.2 Federal Regulatory Requirements**

#### **3.2.1 Fisheries Act**

The fisheries protection provisions under Section 35 of the *Fisheries Act* prohibits “serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery,” unless otherwise authorized by DFO. The definition of serious harm is, “*death of fish or any permanent alteration to, or destruction of, fish habitat*” (Govt. of Canada, 2013). *Fisheries Act* authorization is under Section 35(2) for this project is unlikely required given the application of standard fish and fish habitat mitigations; In the event that an application is required it must be submitted to DFO which satisfies the information requirements set out in the *Fisheries Act* regulations. The application must also include an appropriate fisheries impact offsetting plan.

#### **3.2.2 Canadian Environmental Assessment Act**

Based on the development of a new water supply source in an existing Wellfield Protected Area, we have assumed that the Project will not meet any of the triggering criteria for the *Canadian Environmental Assessment Act* (CEAA) 2012, per *Regulations Designating Physical Activities* (Govt. of Canada, 2014). This should be confirmed by NBDELG.

### **3.3 Provincial Regulatory Requirements**

#### **3.3.1 Clean Environment Act**

The Project will be subject to a Determination Review pursuant to the *Environmental Impact Assessment Regulation* under New Brunswick’s *Clean Environment Act*. The Regulation requires that



projects be registered with NBDELG and that the registration document address all the requirements specified in the Registration Guide including, but not limited to, adequate project detail, environmental baseline information, evidence of public and First Nations consultation, identify potential and known adverse environmental effects of the project undertakings, and proposed methods for mitigating the adverse effects.

### **3.3.2 Clean Water Act**

Since there are no regulated mapped watercourses or wetlands on the Project footprint, a Watercourse and Wetland Alteration (WAWA) Permit is not anticipated to be required (GNB, 2012).

### **3.3.3 Wellfield Protection Program**

At the present time the *Wellfield Protected Area Designation Order - Clean Water Act*, applies to thirty-four municipal wellfield protected areas. The goal of the Program is the identification and designation of Protected Areas, which encompass the entire recharge area associated with and surrounding a wellfield. A wellfield protected area is the area (surface and subsurface) surrounding a water well or wellfield which supplies a public water supply system. In a wellfield protected area, there are prohibitions or limitations on chemical storage and land use activities.

Each Protected Area around a municipal wellfield is divided into three smaller zones: Zone A, Zone B and Zone C. The zones reflect the three most significant types of groundwater contaminants, based on the fact that different contaminants persist in the environment for different time frames, move at different rates and pose different health risks.

## **3.4 Species of Conservation Concern Designation and Legislation**

Species at risk and of conservation concern in New Brunswick are tracked and designated at several levels: Federally by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the *Species at Risk Act* (SARA); and Provincially by *New Brunswick Species at Risk Act* (NBESA) and Atlantic Canada Conservation Data Center (ACCDC) S-Ranks. Each of these provides databases, or a list of species with associated rankings.

### **3.4.1 Committee on the Status of Endangered Wildlife in Canada**

The COSEWIC was established under Section 14 of the *SARA* as an independent advisory body to the federal Minister of Environment and Climate Change. This body is responsible for identifying and assessing species at risk of extinction in Canada and both potential and existing threats to these species. Only species that have been designated by COSEWIC may qualify for legal protection and recovery under *SARA*. However, it is up to the Governor in Council (GIC) to legally protect species designated by COSEWIC (Government of Canada, 2017c). As such, some species not listed or legally protected under *SARA* may still be deemed a species at risk of extinction in Canada by COSEWIC. The status categories used by COSEWIC (2017) include: 'extinct', 'extirpated', 'endangered', 'threatened', 'special concern', 'data deficient', and 'not at risk'.

### **3.4.2 Species at Risk Status**

The Federal SARA aims to prevent Canadian ‘endangered’ or ‘threatened’ species from becoming extinct and to promote their recovery. The Act facilitates the management of species listed as ‘special concern’, in order to prevent them from becoming ‘endangered’ or ‘threatened’. The SARA also protects critical habitat and stipulates compensation, permits, and enforcement. Critical habitat is that which is necessary for the survival or recovery of a species listed as ‘endangered’, ‘threatened’ or ‘extirpated’ on *Schedule 1* of SARA. It is an offence to kill, harm, harass, capture, take, possess, collect, buy, sell or trade an individual of a species listed as ‘endangered’, ‘threatened’ or ‘extirpated’ in Schedule 1 of SARA. The SARA also makes it an offence to damage or destroy the residence of one or more individuals of a species listed in Schedule 1 as ‘endangered’, ‘threatened’ or ‘extirpated’. The species identified in the ACCDC databases were checked against the SARA database to obtain their species at risk status.

### **3.4.3 New Brunswick Species at Risk Act**

The New Brunswick *Species at Risk Act* (NBSARA) was updated in April 2012 from the previous New Brunswick *Endangered Species Act*. *The Species at Risk Regulation* made under this Act lists species at risk of extirpation from the province, making it illegal to “wilfully or knowingly” harm or disturb their critical habitat of these species.

### **3.4.4 Migratory Birds Convention Act**

The *Migratory Birds Convention Act* (MBCA) (Govt. of Canada, 2010) is administered by Environment and Climate Change Canada. The Act protects over 500 species of migratory birds, including the protection of their eggs and their nests (MBCA, 1994). The Canadian Wildlife Service (CWS) is a division of EC and is responsible of administering the Act with assistance from the enforcement branch of EC. It is illegal, under Section 6 of the *Migratory Bird Regulations* (MBR) (Govt. of Canada, 2013) of the MCBA, to disturb, destroy or take migratory birds and their nests and eggs, except by permit for scientific, educational or other specific purposes. Section 5 of the MBCA prohibits the possession, selling, buying or exchanging of a migratory bird or nest, and also prohibits the deposition of substances that may be harmful to migratory birds. Such substances cannot be deposited into waters frequented by migratory birds, or into an area that may enter those waters.

### **3.4.5 Atlantic Canada Conservation Data Centre**

The ACCDC maintains linked databases that document what species occur in the Maritimes, and the locations at which provincially-rare species are known to occur and have been documented. Species on the ACCDC list are ranked according to Subnational Rarity Rank (S-Rank) of taxon. For explanation of S-Ranks, see Appendix B. An ACCDC listing of rare and endangered species sightings was acquired for a 5 km radius around the proposed study area and the report has been included in Appendix C. Each entry includes the COSEWIC status, federal and provincial SARA designations, and ACCDC S-Ranks.

### **3.4.6 Second Atlas of Breeding Birds of the Maritime Provinces**

The Second Atlas of Breeding Birds of the Maritime Provinces (MBBA) provides detailed information on the breeding status (i.e., ‘confirmed’, ‘probable’ and ‘possible’ breeders), distribution, and abundance of bird species, including rare and at risk species that breed in the Maritime Provinces

(Stewart et al., 2015). Data collection for this volume occurred between 2006 and 2010. The MBBA database was queried to provide baseline data of birds potentially breeding within and near the Project area. The Project site occurs in one atlas square (100 km<sup>2</sup> sampling unit).

## CHAPTER 4 **PUBLIC ENGAGEMENT**

### **4.1 Objectives**

The Town of St. George aims to address and conduct the necessary public notification and involvement standards required for the Project. The minimum public notifications and involvement standards that will be addressed includes, but not limited to, directly communicating and providing written notification to identified individuals and groups, and submitting a public notice in a local newspaper.

While it is recognized that not all concerns can be addressed to the satisfaction of all parties, The Town of St. George is expected to respond to the public in an open and forthright manner and resolve or address as many of their concerns as possible, while clearly identifying those which could not be resolved.

Given the scale, location and existing land use of the site, it is not anticipated that this Project will impact a large number of stakeholders. The objectives of the consultation and engagement program undertaken for this Project are to:

- Ensure that those potentially affected by the Project are aware of the Registration;
- Advise stakeholders how to obtain additional information about the Project;
- Ensure stakeholders are able to ask any questions or express any concerns they may have about the Project;
- Respond to stakeholders openly and promptly, resolving as many concerns as possible and identifying those which could not be resolved; and
- Provide a report documenting the consultation and engagement process to DELG, including a summary of comments received.

### **4.2 Stakeholder List**

A list of stakeholders has been developed and will be updated as required throughout the Project. This list will be used to maintain two-way communication prior to and throughout the consultation and engagement program. The following stakeholder groups in Table 4.1 have been identified to date.

**Table 4.1: List of Stakeholders**

<b>Category</b>	<b>Organization</b>
<b>Key Stakeholders</b>	Mayor (Crystal Cook) and Councillors Town CAO (Jane Lee) and staff True North (Cooke Aquaculture, Glen Cooke) Northern Harvest (Larry Ingalls)
<b>First Nations</b>	See Section 4.4

### **4.3 Wellfield Protection Impacts to Stakeholders**

The Town recognizes that the development of a new wellfield could negatively impact local residents that currently own or operate within the potential wellfield area. At this time, the protection zones have not been established. However, as the project and exploration progresses, the Town will ensure that any potentially affected stakeholder is notified early in the process.

### **4.4 First Nation – Duty to Consult**

Following the submission and subsequent review of this preliminary document, we will be in contact with the Aboriginal Affairs Secretariat (AAS) to determine: (1) if there is a Duty of Consult; and (2) the recommended consultation program.

## CHAPTER 5 **ENVIRONMENTAL BASELINE**

### **5.1 Geology and Topography**

The Project area falls in the Valley Lowlands Ecoregion. The geology of this ecoregion is highly varied. The dominant lithology comprises sedimentary and metasedimentary rocks of Ordovician, Silurian, and Carboniferous age (NBDNR, 2003). The Saint John River dominates the northern part of the Valley Lowland ecoregion, being the watershed for all lesser rivers and streams in the area (NBDNR, 2003).

### **5.2 Climate and Meteorological Conditions**

At the regional scale, Atlantic Canada lies within a zone of prevailing westerly winds that carry air from the interior of the North American continent. This zone experiences the passage of high and low pressure systems which are in turn influenced by ocean currents and continental topography. The low pressure systems moving through this area typically track across the continent, or up the seaboard, resulting in the onset of wind from an easterly direction, thickening cloud and a gradual drop in pressure. The frequent movement of such systems through Atlantic Canada brings significant precipitation. Winters are usually cold with frequent snowfall and freezing precipitation. Spring is typically late (sometime in May), cool and cloudy. Summers are short in duration, warm and are characterized by less precipitation than in other seasons.

In recent years, extreme weather events have been occurring more frequently. The Province has been subjected to both drought and intense storms. Tropical weather events are expected to be both more intense and frequent as the effects of climate change influence ocean warming and coastal currents. Climate models predict an increase in extreme local events throughout this century.

The site is situated in close proximity to the Bay of Fundy and the climate is influenced accordingly by ocean temperatures. The Bay of Fundy water temperatures average between 0-4°C in the winter and 8-12 °C in the summer causing mild winters and cool wet summers. In general, the Valley Lowland ecoregion has a continental climate that is sheltered from the maritime influences of the Northumberland and Fundy coasts (NBDNR, 2003). Summers are warmer and winters are colder than in areas closer to the coast. This ecoregion receives less precipitation than other ecoregions

due to its lower elevation. The relatively warm dry summers have contributed to a fairly high incidence of wildfires across the region (NBDNR, 2003).

### 5.3 Species of Conservation Concern

A review of the ACCDC database was conducted and a list of species of conservation concern that were previously identified within a 5 km buffer of the Project site was obtained (Appendix C). A screening of the ACCDC list resulted in a shortlist of 50 different species of conservation concern. The species of conservation concern includes 14 vascular flora species, 33 vertebrate species, and 3 invertebrate species and each species is listed in Table 5.1. Subsequent sections of this report address specific taxa explicitly (i.e., Avifauna, CRA Fisheries).

**Table 5.1: Summary of Species of Conservation Concern Recorded within 5 km of the Project Area**

Common Name	Scientific Name	COSEWIC	Federal SARA Designation	NB SARA Designation	ACCDC S-Rank
American Shoreweed	<i>Littorella uniflora</i>				S3
Atlantic Salmon	<i>Salmo salar</i>				S2S3
Bank Swallow	<i>Riparia riparia</i>	Threatened			S2S3B,S2S3M
Barn Swallow	<i>Hirundo rustica</i>	Threatened		Threatened	S2B,S2M
Black Scoter	<i>Melanitta nigra</i>				S3M,S1S2N
Black-crowned Night-heron	<i>Nycticorax nycticorax</i>				S1S2B,S1S2M
Bobolink	<i>Dolichonyx oryzivorus</i>	Threatened		Threatened	S3B,S3M
Bufflehead	<i>Bucephala albeola</i>				S3M,S2N
Canada Serviceberry	<i>Amelanchier canadensis</i>				S3
Canada Warbler	<i>Wilsonia canadensis</i>	Threatened	Threatened	Threatened	S3B,S3M
Cardinal Flower	<i>Lobelia cardinalis</i>				S3
Chimney Swift	<i>Chaetura pelagica</i>	Threatened	Threatened	Threatened	S2S3B,S2M
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>				S2S3B,S2S3M
Clinton's Clubrush	<i>Trichophorum clintonii</i>				S3
Common Eider	<i>Somateria mollissima</i>				S3B,S4M,S3N
Common Moorhen	<i>Gallinula chloropus</i>				S1B,S1M
Common Nighthawk	<i>Chordeiles minor</i>	Threatened	Threatened	Threatened	S3B,S4M
Ditch Stonecrop	<i>Penthorum sedoides</i>				S3
Eastern Cougar	<i>Puma concolor pop. 1</i>	Data Deficient		Endangered	SU
Eastern Kingbird	<i>Tyrannus tyrannus</i>				S3S4B,S3S4M
Eastern Skunk Cabbage	<i>Symplocarpus foetidus</i>				S2
Eastern Wood-Pewee	<i>Contopus virens</i>	Special Concern		Special Concern	S4B,S4M
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	Special Concern			S3B,S3S4N,SUM
Fragile Forktail	<i>Ischnura posita</i>				S2
Fringed Milkwort	<i>Polygala paucifolia</i>				S2

Common Name	Scientific Name	COSEWIC	Federal SARA Designation	NB SARA Designation	ACDC S-Rank
Glaucous Gull	<i>Larus hyperboreus</i>				S2N,S2M
Killdeer	<i>Charadrius vociferus</i>				S3B,S3M
Lake Utopia Smelt large-bodied pop.	<i>Osmerus mordax pop. 2</i>	Threatened		Threatened	
Lake Utopia Dwarf Smelt	<i>Osmerus mordax pop. 1</i>	Threatened		Threatened <sup>1</sup>	S1
Large Purple Fringed Orchid	<i>Platanthera grandiflora</i>				S3
Least Bittern	<i>Ixobrychus exilis</i>	Threatened	Threatened	Threatened	S1S2B,S1S2M
New England Violet	<i>Viola novae-angliae</i>				S2
Northern Arrow-Wood	<i>Viburnum recognitum</i>				S2
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>				S1S2B,S1S2M
Northern Shoveler	<i>Anas clypeata</i>				S2S3B,S2S3M
Pine Siskin	<i>Carduelis pinus</i>				S3
Red Crossbill	<i>Loxia curvirostra</i>				S3
Roseroot	<i>Rhodiola rosea</i>				S3
Solitary Sandpiper	<i>Tringa solitaria</i>				S2B,S5M
Spotted Coralroot	<i>Corallorhiza maculata</i>				S3S4
Spotted Sandpiper	<i>Actitis macularius</i>				S3S4B,S5M
Swamp Spreadwing	<i>Lestes vigilax</i>				S3
Toothed Flatsedge	<i>Cyperus dentatus</i>				S3
Turkey Vulture	<i>Cathartes aura</i>				S3B,S3M
Two-spotted Skipper	<i>Euphyes bimacula</i>				S3
Virginia Rail	<i>Rallus limicola</i>				S3B,S3M
Warbling Vireo	<i>Vireo gilvus</i>				S3B,S3M
Water Smartweed	<i>Polygonum amphibium var. emersum</i>				S2
Willow Flycatcher	<i>Empidonax traillii</i>				S1S2B,S1S2M
Wilson's Snipe	<i>Gallinago delicata</i>				S3S4B,S5M

<sup>1</sup> Status has been updated as per the New Brunswick Species at Risk Public Registry website

#### 5.4 Managed and Significant Areas

The St. George Marsh Ducks Unlimited area has been identified by ACCDC and is located within 5 km of the Project location. The marsh covers approximately 85 hectares and provides permanent habitat to multiple species and provides breeding and foraging habitat for a range of species, including the at-risk Least Bittern (*Ixobrychus exilis*), Canada Warbler (*Cardellina Canadensis*), Common Nighthawk (*Chordeiles minor*), and Snapping Turtle (*Chelydra serpentina*). In addition, the



St. George Marsh is identified as critical habitat in the Recovery Strategy for the Least Bittern in Canada (Environment Canada, 2014).

Two Environmentally Significant Areas (ESAs) were identified within 5 km of the Project area. ESA are defined as places that are distinctive because (a) they contain rare species of animals or plants or a rich diversity of species representation of an ecological zone; (b) their disturbance would have serious ecological consequences; or (c) they contain geological or other features of specific scientific interest.

The two areas identified by ACCDC are:

1. St. George Roadcuts ESA.
2. Magaguadavic River ESA.

## 5.5 Forest Cover

Based on a desktop analysis, land cover around the Project area includes mature coniferous and deciduous forests, young forests, wetlands, and open country. Agricultural lands and some residential areas are also present.

The landscape of New Brunswick is typical of the Atlantic Northern Forest with mountainous terrain, lowland plains and coastal landforms. Northern temperate forests dominate a large portion of NB, and the most predominant forest types include coniferous forests (27 000 km<sup>2</sup>), mixed deciduous-coniferous forests (14 000 km<sup>2</sup>) and deciduous forests (13 000 km<sup>2</sup>) (Environment Canada, 2013). Other major habitat types of New Brunswick consist of early successional shrubland habitat including regenerating forests (5 300 km<sup>2</sup>) and natural shrublands (650 km<sup>2</sup>). The principal land use since European settlement has been forest resource harvesting. As of 2006, only 3% of New Brunswick's forest area remained untouched by humans (Environment Canada, 2013).

The forest cover of Valley Lowlands Ecoregion is primarily composed of species with southern affinities, with approximately 30 species represented. These include red spruce (*Picea rubens*), basswood (*Tilia americana*), butternut (*Juglans cinerea*), ironwood (*Ostrya virginiana*), silver maple (*Acer saccharinum*), and white ash (*Fraxinus americana*) (NBDNR, 2003). Eastern white cedar (*Thuja occidentalis*) may occur in the low-lying areas of water seepage, especially on calcareous soils. Silver maple is restricted to moist bottomlands or floodplains (NBDNR, 2003).

Mixed forests of red spruce, sugar maple, yellow birch, and white ash cover the lower midslopes, which are joined farther upslope by beech and ironwood. Midslopes on coarse acidic soils may support various mixedwood communities of red pine (*Pinus resinosa*), white pine (*Pinus strobus*), red oak (*Quercus rubra*), aspen, yellow birch (*Betula alleghaniensis*), red spruce (*Picea rubens*), balsam fir (*Abies balsamea*), and eastern hemlock (*Tsuga canadensis*) (NBDNR, 2003). Typically, the medium to higher elevation hilltops feature tolerant hardwoods: sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), beech (*Fagus grandifolia*), and white ash (*Fraxinus americana*). The rockier ridges, however, may support red oak and ironwood: on very rocky sites white pine, red spruce or white spruce (*Picea glauca*) predominate (NBDNR, 2003).

Since the 1700s, anthropogenic practices (e.g., tree harvesting and agriculture) have significantly altered the original forests of this ecoregion. Mixed stands of white pine, tolerant hardwoods, spruce, and hemlock were likely more abundant in the past and to some degree, have been replaced by forest communities of aspen, red maple (*Acer rubrum*), white spruce, and balsam fir (NBDNR, 2003). Abandoned farmlands are now occupied by white spruce and tamarack (*Larix laricina*), while trembling aspen (*Populus tremuloides*), balsam fir, red maple, and white birch (*Betula papyrifera*) occur in areas that have been clear cut or burned repeatedly (NBDNR, 2003).

The prominence of tolerant hardwoods through much of the region is evident that fire has been relatively infrequent in the last several hundred years. Across most of the ecoregion, understory species are characteristic of the predominant mixed-wood environments (NBDNR, 2003). These understory species include the trout lily (*Erythronium americanum*), hay-scented fern (*Dennstaedtia punctilobula*), sensitive fern (*Onoclea sensibilis*), and Christmas fern (*Polystichum acrostichoides*). Alternate-leaved dogwood (*Cornus alternifolia*) and riverbank grape are often found at the lowest elevations (NBDNR, 2003).

## 5.6 Wetlands

New Brunswick's wetlands are the most diverse non-forested ecosystem. By definition, wetlands occur where the water table lies at or near the surface or where shallow water covers an area of land for a period of time during the growing season and are characterized by plants adapted to saturated soil conditions (NBDNR, 2003). Wetlands perform many important functions and services such as helping to control flooding, filtering sediments and toxic substances, improving water quality, providing habitat and food for many species, and recharging groundwater (Environment Canada, 2016). There have been many approaches used for distinguishing between wetland types, but one of the more comprehensive and practical schemes is the Canadian Wetland Classification System (CWCS) as described by the National Wetland Working Group. CWCS's approach is based on five major classes that capture a range of hydrology, with accompanying changes in nutrient availability, rates of decomposition, and characteristic vegetation (NBDNR, 2003)

A variety of wetland types occur within the Valley Lowlands Ecoregion of NB. Lakes are prevalent in the southerly ecodistricts and many of these lakes are flanked by marshlands, or by narrow zones of shallow open water wetlands that contain a variety of plants such as fragrant water lily (*Nymphaea odorata*) and sweet flag (*Acorus calamus*) (NBDNR, 2003). The ecoregion's abundant peatlands are situated mainly in the southwest, where they have often formed large complexes that grade into marshes, shrub swamp, or wet forests. The wide range of peatland types occurs, not just because the substrates (and hence ground acidity levels) vary from one lithology to another, but also because the peatlands themselves have disparate origins (NBDNR, 2003). Some consist of raised bogs with well-defined borders that formed in depressions and display many large pools. Others occur where moraine deposits (that is, extensive ridges of sand and gravel left behind by melting glaciers) have severely restricted the drainage of surface waters (NBDNR, 2003).

The GeoNB (provincial data) wetlands layer was reviewed, and regulated wetlands were identified in close proximity to the Project site (Figure 5.1). The regulated wetlands identified are classified as aquatic bed, bog, freshwater marsh, and shrub wetland. A general description of these base wetland types and their ecological character, including information on vegetation, soil and hydrology indicators are provided below. While these descriptions serve to provide a baseline of information, they do not necessarily describe the unique characteristics present in each of the wetlands that occur within proximity to the Project.

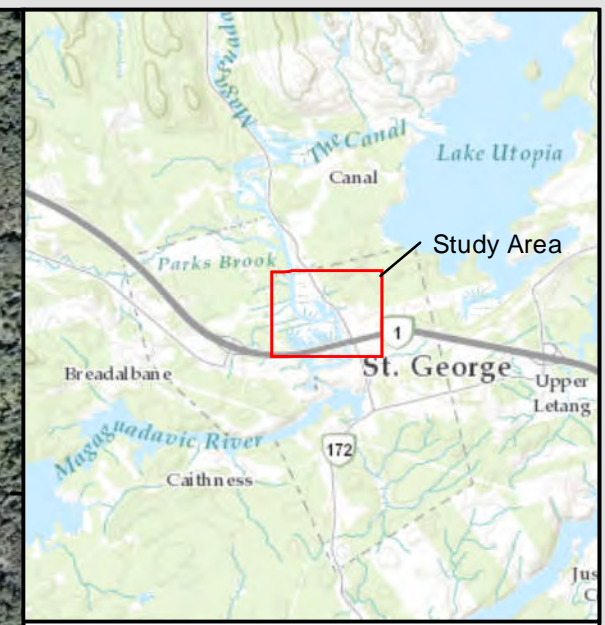
Regulated wetlands that have been identified within close proximity to the Project location.

**Aquatic Beds:** Aquatic beds are wetland habitats that develop optimally under conditions of permanent and repeated flooding and thus occupy many rivers, oxbows, streams, and ponds. Aquatic beds often occur where emergent marshes transition to deeper water environments, typically within 0.60 to 1.0 m of water but may be as deep as 3.0 m. Aquatic beds are composed of a diversity of plant communities that require surface water for most of the growing season. These plants may be attached to a substrate or free-floating both above and below the water surface. Aquatic beds can be further distinguished based on the dominant plant type present (i.e., either algae, moss, rooted vascular or floating vascular (Cowardin et al., 1979).

Common species within our area may include variegated yellow pond-lily (*Nuphar variegata*), water shield (*Brasenia schreberi*), white water-lily (*Nymphaea odorata*), bladderworts (*Utricularia* spp.), lesser duckweed (*Lemna minor*), pickerel weed (*Pontederia cordata*), pondweeds (*Potamogeton* spp.), milfoils (*Myriophyllum* spp.), bulrushes (*Schoenoplectus* spp.), bur-reeds (*Sparganium* spp.), three-way sedge (*Dulichium arundinaceum*), and various spike-rushes (*Eleocharis* spp.).

**Bog:** The Canadian Wetland Classification System (National Wetlands Working Group, 1997) defines bogs as ombrogenous peat landforms, meaning the primary source of wetland hydrology is local precipitation. Bogs can be treed (chiefly by black spruce and tamarack) or treeless, and *Sphagnum* mosses and ericaceous shrubs such as lambkill (*Kalmia angustifolia*), Labrador tea (*Ledum groenlandicum*), and leatherleaf (*Chamaedaphne calyculata*) frequently dominate these wetlands. Bogs are known for their slightly acidic environments due to the decomposition of *Sphagnum* and their lack of infiltration from runoff waters or groundwater. The water table is at, or slightly below, the wetland surface, and the organic soil layer (Histosol) is deep and consists mainly of decomposed *Sphagnum*.

**Freshwater Marsh:** Marshes are defined by the Canadian Wetland Classification System (National Wetlands Working Group, 1997) as wetlands with shallow waters that fluctuate daily, seasonally, or annually due to events such as flooding, evapotranspiration, groundwater recharge, or seepage losses. Marshes receive water from many sources, including surface runoff, stream inflow, precipitation and groundwater discharge. This influx of water results in a high nutrient level in the soil (which ranges from mineral to organic) that supports a wide variety of vegetation, predominantly emergent aquatic macrophytes. Typical marsh vegetation includes cattails (*Typha* spp.), sedges (*Carex* spp.), rushes (*Juncus* spp.), bulrushes (*Scirpus* spp. and *Schoenoplectus* spp.), and



- Proposed Test Well
- Watercourses
- Wetland Classification**
- Aquatic Bed
- Bog
- Freshwater Marsh
- Shrub Wetland



## SAINT GEORGE GROUNDWATER EXPLORATION

### Wetland Classifications

Drawn: MD	Date: 19/10/2017
Checked:	CBCL Project: # 162865.00
Approved:	Scale @ 11"x17": 1:5,000

<b>Map Parameters:</b> NAD 1983 CSRS New Brunswick Stereographic Projection: Double Stereographic Datum: North American 1983 CSRS False Easting: 2,500,000.0000 False Northing: 7,500,000.0000 Central Meridian: -66.5000 Scale Factor: 0.9999 Latitude Of Origin: 46.5000 Units: Meter	<b>Data Sources:</b> Service NB (GEONB) Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo,
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numerous species of grasses including reed canary grass (*Phalaris arundinacea*), manna grasses (*Glyceria* spp.), and reedgrasses (*Calamagrostis* spp.).

**Shrub Swamp:** Swamps that are dominated by woody vegetation less than 6.1 m (20 feet) in height and a diameter at breast height (dbh) less than 150mm (6”) are classified as shrub swamps. Some common shrub species include speckled alder (*Alnus incana*), various species of willow (*Salix* spp.), wild raisin (*Viburnum nudum* var. *cassionoides*), black holly (*Ilex verticillata*) and false holly (*Nemopanthus mucronatus*). The tree canopy is typically limited to absent, but when it exists, may contain scattered red maple, balsam fir, and yellow birch. The herb stratum can be very diverse and include species such as sensitive fern, soft rush (*Juncus effusus*), creeping buttercup (*Ranunculus repens*), cinnamon fern (*Osmunda cinnamomea*), sedges (*Carex* spp.) and grasses.

## 5.7 Avifauna Desktop Study

A desktop analysis was performed to identify avian species of conservation of concern that may occur within proximity to the Project. The analysis consisted of a review of an ACCDC data report (ACCDC, 2017), and a review of the MBBA database (Stewart et al., 2015). The Project location occurs within atlas square 19FL70, where 109 avian species were recorded. Of the 109 species detected in the atlas square, 52 species were classified as ‘confirmed’ breeders, 33 species were classified as ‘probable’, and 24 as ‘possible’ breeders. The MBBA square summary is located in Appendix D.

The following avian species, with provincial or federal SARA designation, were identified within proximity to the Project area:

**Barn Swallow (*Hirundo rustica*):** The Barn Swallow is listed as ‘Threatened’ by COSEWIC but has no status under the federal SARA. At the provincial level, the Barn Swallow is listed as ‘Threatened’ (NB SARA) and has an S-Rank of ‘S2B, S2M’. The MBBA indicates the Barn Swallows were more abundant and widespread than is present today and the probability of observing this species has dramatically decreased (Stewart et al., 2015).

Barn Swallows require a shelf or vertical substrate for placing its nest which can occur on various man-made structures such as barns, bridges, and cottages (Stewart et al., 2015). The Barn Swallow prefers to feed in open areas over grassy pastures, in plowed fields, and around farmyards and domestic animals (Brown and Brown, 1999).

**Bobolink (*Dolichonyx oryzivorus*):** Bobolink is ranked as ‘Threatened’ at the federal level (COSEWIC, 2010) and ‘Threatened’ at the provincial level (NB SARA). The ACCDC ranked Bobolink as ‘S3B, S3M’ in NB. Bobolink are primarily found on agricultural fields (hayfields and pasture) but have also been found breeding in fen, floodplain, and upper saltwater meadows (Stewart et al., 2015). The main causes for decline in Bobolink populations include incidental mortality from agricultural operations (hay cutting and cattle grazing), habitat loss and fragmentation, and pesticide use (COSEWIC, 2010).

**Canada Warbler** (*Cardellina canadensis*): In general, Canada Warblers can breed in a wide range of deciduous and coniferous forests. At lower elevations, they are often restricted to cool, wet, low-lying areas such as swamps, bogs, and can also be found in alder stands along stream banks (Reitsma, 2009). The Canada Warbler is widely distributed across every Maritime region and is strongly associated with wetlands and dense understoreys (Stewart et al., 2015). The Canada Warbler is ranked as 'Threatened' at the federal (SARA) and provincial (NB SARA) levels and is protected under the MBCA. The ACCDC ranked Canada Warbler as 'Vulnerable' (S3B, S3M) in NB.

**Chimney Swift** (*Chaetura pelagica*): The Chimney Swift is ranked as 'Threatened' at both federal (SARA) and provincial (NB SARA) levels. The provincial S-Rank for Chimney Swifts is 'S2S3B, S2M' (ACCDC) and is also protected in Canada under the MBCA. The national breeding bird survey had detected range-wide declines and in the Maritimes, the Chimney Swift has been disappearing in many areas where it was once detected (Stewart et al., 2015). Although found in a variety of habitats, the Chimney Swift appears to be more concentrated in urban area where there are large concentrations of chimneys for nest sites and communal roosts (Steeves et al., 2014). Chimney Swifts forage over a variety of habitats including forests, open country, lakes, pond, and both suburban and urban areas (Steeves et al., 2014).

**Common Nighthawk** (*Chordeiles minor*): The Common Nighthawk is listed as 'Threatened' both provincially (NB SARA) and federally (SARA) and has a provincial rank of 'S3B, S4M' (ACCDC). The Common Nighthawk is also protected under the MBCA.

Common Nighthawks use a variety of open and semi-open habitats which range from coastal sand dunes and beaches, logged or slash burned areas of forest, woodland clearings, grassland habitat, open forests, rock outcrops, and flat gravel rooftops of city buildings (Stewart et al., 2015, Brigham et al., 2011). In the Maritimes, varied habitat associations include open areas such as regenerating forests and some types of wetlands (Stewart et al., 2015).

**Eastern Wood-Pewee** (*Contopus virens*): The Eastern Wood-Pewee is listed as 'Special Concern' provincially (NB SARA) and federally by COSWEIC (not a Schedule 1 species). The ACCDC has ranked the Eastern Wood-Pewee as 'S4B, S4M' in NB and protected under the MBCA.

Across its range, the Eastern Wood-Pewee is found in deciduous and mixed forests, usually associated with forest clearings and edges (McCarty, 1996). In the Maritimes, the Eastern Wood-Pewee is found in older, predominately deciduous forests and shows some preference for riparian forests, especially in NB (Stewart et al., 2015). Stewart et al.(2015) also states that Eastern Wood-Pewees avoid young coniferous and managed forests as well as human-occupied areas.

**Least Bittern** (*Ixobrychus exilis*): The Least Bittern is listed as 'Threatened' at the federal and provincial level and is protected under the MBCA. Least Bittern habitat consists of freshwater and brackish marshes with dense, tall growths of aquatic or semiaquatic vegetation interspersed with clumps of woody vegetation and open water. In the Maritimes, the Least Bittern is closely associated with cattail marshes (Stewart et al., 2015).

## 5.8 Socio-economic Environment

### 5.8.1 Population Profile

The population of the Town of St. George has remained fairly steady over the last 20 years, with small fluctuations in the population from year to year (Table 5.2). However, in 2016, the total population of St. George was 1,517, which represents a change of -1.7% from 2011 (Statistics Canada, 2017). This compares to the provincial average of -0.5% and the national average of 5.0%. The land area of St. George is 16.17 km<sup>2</sup> with a population density of 93.8 people/ km<sup>2</sup> (Statistics Canada, 2017).

**Table 5.2 Population Census results for the Town of St. George, NB.**

Year	1996	2001	2006	2011	2016
Population of St. George	1,414	1,509	1,309	1,543	1,517

In 2016, there were 637 private dwellings occupied in St. George (Town), which represent a change of 0.2% from 2011. The working age population (15 to 64) represented 64.7% of the total population (Table 5.3; Statistics Canada, 2017). In comparison, for Canada the proportions of children, of seniors and in age of working were 16.6%, 16.9% and 66.5% in 2016. In addition, 230 children aged 0 to 14 and 305 persons aged 65 and over were enumerated in St. George, representing respectively 15.2% and 20.1% of the total population (Statistics Canada, 2017).

**Table 5.3 Age distribution by broad age groups and sex from the 2016 Census.**

Age groups	Both sexes	Males	Females
0 to 14	15.2%	15.8%	14.0%
15 to 64	64.7%	66.4%	63.1%
65 and over	20.1%	17.8%	22.9%

## 5.9 Commercial, Recreational and Aboriginal Fisheries

The Project is in the vicinity to the Magaguadavic River and an unnamed tributary to the Magaguadavic River. The Magaguadavic River is a large permanent watercourse that empties into the Magaguadavic Basin, and subsequently Passamaquoddy Bay. A review of literature and online resources was completed to establish a list of potential fish species that could reside in, or migrate through, these waterbodies (Table 5.4). The species list is not exhaustive, nor confirmed through either consultation with regulators, or a fish sampling program. A total of 33 species were identified as potentially present; 17 of these could be considered to be a commercial, recreational, or aboriginal (CRA) fish species in the Maritimes. Literature has also identified a number of CRA fisheries near the Project area (Table 5.5). The following sources were utilized:

- Atlantic Salmon and Alewife Passage Through a Pool and Weir Fishway on the Magaguadavic River (Martin, 1984);

- CBC “No wild Atlantic salmon returned to Magaguadavic River to spawn, conservation group says” (Mackinnon, 2017);
- Atlantic Salmon (*Salmo salar*) in the Magaguadavic River New Brunswick 1992-1997 (Carr and Whorisky, 1998);
- Canadian Rivers Institute Freshwater Species Distribution Maps (CRI, 2014);
- Fish 2017: A Part of our Heritage (GNB, 2017);
- Marine Aquaculture Site Mapping Program (NBAFF, 2017); and
- Atlantic Canada Conservation Data Centre (ACCDC, 2017).

**Table 5.4: Potential Fish Species Present in Study Area:**

Species	Scientific Name	CRA*	Source
Alewife (Gaspereau)	<i>Alosa pseudoharengus</i>	C, R, A	Martin, 1984
American Eel	<i>Anguilla rostrata</i>	C, R, A	Martin, 1984
Atlantic Salmon (anadromous & landlocked)	<i>Salmo salar</i>	C (fish farms), R (landlocked population), A	MacKinnon, 2017; Martin, 1984; Carr, 1998
Brook Trout	<i>Salvelinus fontinalis</i>	R, A	Martin, 1984; Carr, 1998
Brown Bullhead	<i>Ameiurus nebulosus</i>	R	CRI, 2014
Brown Trout	<i>Salmo trutta</i>	R	Martin, 1984; Carr, 1998
Burbot	<i>Lota lota</i>	R	GNB, 2017
Lake Chub	<i>Couesius plumbeus</i>	R	CRI, 2014
Lake Whitefish	<i>Coregonus clupeaformis</i>	C, R	GNB, 2017
Pumpkinseed	<i>Lepomis gibbosus</i>	R	CRI, 2014
Rainbow Smelt	<i>Osmerus mordax</i>	C, R	Martin, 1984
Rainbow Trout	<i>Oncorhynchus mykiss</i>	R, A	Martin, 1984; Carr, 1998
Smallmouth Bass	<i>Micropterus dolomieu</i>	R	Martin, 1984; Carr, 1998
Striped Bass	<i>Morone saxatilis</i>	R, A	GNB, 2017
White Perch	<i>Morone americana</i>	R	GNB, 2017
White Sucker	<i>Catostomus commersonii</i>	R	CRI, 2014
Yellow Perch	<i>Perca flavescens</i>	C, R	GNB, 2017
Non-CRA Species			
Banded Killifish	<i>Fundulus diaphanus</i>		CRI, 2014
Blacknose Dace	<i>Rhinichthys atratulus</i>		CRI, 2014
Brook Stickleback	<i>Culaea inconstans</i>		CRI, 2014
Common Shiner	<i>Luxilus cornutus</i>		CRI, 2014
Creek Chub	<i>Semotilus atromaculatus</i>		CRI, 2014
Fallfish	<i>Semotilus corporalis</i>		CRI, 2014
Fourspine Stickleback	<i>Apeltes quadracus</i>		CRI, 2014
Golden shiner	<i>Notemigonus crysoleucas</i>		CRI, 2014
Lake Utopia Dwarf Smelt	<i>Osmerus mordax pop. 1</i>		ACCDC
Lake Utopia large-bodied Smelt	<i>Osmerus mordax pop. 2</i>		ACCDC
Longnose Sucker	<i>Catostomus catostomus</i>		CRI, 2014



Species	Scientific Name	CRA*	Source
Mummichog	<i>Fundulus heteroclitus</i>		CRI, 2014
Ninespine Stickleback	<i>Pungitius pungitius</i>		CRI, 2014
Northern Redbelly Dace	<i>Chrosomus eos</i>		CRI, 2014
Pearl Dace	<i>Margariscus margarita</i>		CRI, 2014
Threespine Stickleback	<i>Gasterosteus aculeatus</i>		CRI, 2014

\* Commercial (C), Recreational (R), Aboriginal (A)

**Table 5.5: CRA Fisheries Present in Study Area or Surrounding Area**

Fishery Type	Species	Source	Distance to Study Area
Dip Net – Recreational (closed in Utopia Lake)	Landlocked smelt	Martin, 1984; Carr, 1998	Lake Utopia tributary streams
Commercial	American eels (silver eels)	Martin, 1984; Carr, 1998	Lower section of Magaguadavic River
Lobster Bait – Permit	Alewife	Martin, 1984; Carr, 1998	Lower section of Magaguadavic River
Marine Finfish Aquaculture (~46 licenses)	Finfish (Atlantic salmon)	NBAAF, 2017; MacKinnon, 2017	Passamaquoddy Bay, > 4km to mouth of Magaguadavic River
Recreational	Landlocked Salmon, Trout, Smallmouth Bass, Eel, Burbot, Gaspereau, Smelt, Whitefish, White perch, Yellow perch	GNB 2017; Martin, 1984	Magaguadavic River and surrounding waterbodies (Lake Utopia, Magaguadavic Lake)

Of the 33 species identified in Table 5.4, six have been listed as a species of conservation concern through COSEWIC, SARA, the NB *Species at Risk Act*, or ACCDC (Table 5.6). Species descriptions, including habitat preference, for species of conservation concern can be found below.

**Table 5.6: Species of Conservation Concern**

Species	COSEWIC	SARA	NB Species at Risk	ACCDC Rarity Ranks
Lake Utopia Dwarf Smelt	Threatened	Threatened - Schedule 1	Threatened	S1
Lake Utopia large-bodied Smelt	Threatened		Threatened	Unknown
Atlantic Salmon * Outer bay of Fundy	Endangered		Threatened	S2S3
American Eel	Threatened		Threatened	S4
Striped Bass	Endangered		Endangered	S3

**Atlantic salmon** (*Salmo salar*): The Gulf of St. Lawrence population of Atlantic salmon are an anadromous species listed as S2S3 by ACCDC, ‘Threatened’ by NB SARA, and ‘Endangered’ under COSEWIC. Atlantic salmon spend part of their life feeding and growing during long migrations at sea and then returning to reproduce in their natal freshwater streams. Spawning Atlantic salmon move upriver from spring through fall. Spawning occurs from October to November usually in gravelly

substrates near the head of riffles, or the tail of a pool. Young salmon parr usually live in shallow riffle areas that have gravel, cobble, or boulder bottoms (Page et al., 1991). Spawning adults immediately return to sea or overwinter in freshwater until returning to sea in spring. The preferred freshwater habitats for each life stage of Atlantic salmon are riffles and pools with high percentages of pebble and gravel substrate.

**American eel (*Anguilla rostrata*):** The American eel is listed as ‘Threatened’ under the COSEWIC designations and NB SARA. American eels spawn in the Sargasso Sea which is located within the Atlantic Ocean. Nursery areas can be located in salt or freshwater. Adults typically overwinter in muddy bottoms in bays and estuarine habitats. American eels prefer shallow, protected waters, and rock, sand, mud, woody debris and aquatic vegetation for cover. Eelgrass and interstitial spaces are also important for cover. They forage on fish, molluscs, crustaceans, insect larvae, surface-dwelling insects, worms, and plants (COSEWIC, 2012). American eel have been known to tolerate dissolved oxygen levels as low as 4 mg/l (Rulifson et al., 2004) and pH as low as 4.0 (Reynolds, 2011). American eel has supported major CRA fisheries and is important both culturally and historically to Aboriginal groups and communities across Canada (COSEWIC, 2012).

**Striped bass (*Morone saxatilis*):** Striped bass are a semi-anadromous species that occurs naturally along most of the eastern seaboard of North America (Bain et al., 1982) and are designated as ‘Endangered’ under COSEWIC and NB SARA. Striped bass spend most of their life in marine environments, with spawning occurring in fresh or brackish water. (Bain et al., 1982). Eggs and larvae drift in the pelagic zone with juveniles feeding on benthic macro-invertebrates and zooplankton. Adult striped bass diet consists mainly of soft-rayed fishes. Striped bass avoid areas with temperatures above 25°C. In the lab, juveniles acclimated to 5.0°C in estuarine salinities (5-30) survived a gradual temperature decrease of 2.3 °C·day<sup>-1</sup> to sub-zero temperatures (Hurst and Conover, 2002). However, the lower lethal temperature for juveniles acclimated to 15.0°C in fresh water is 2.4°C (Cook et al., 2006). Juveniles overwintering in brackish water (13-18 salinity) preferred 4°C to 5°C (Buhariwalla et al., 2016). Adults utilize a broader thermal range of 6.5°C to 28.0°C during summer foraging (Nelson et al., 2010) and have been recorded overwintering in temperatures of 1.2°C to 7.5°C (Buhariwalla et al., 2016). Striped bass prefer well-oxygenated water with >44% dissolved oxygen. Successful spawning occurs in areas with a velocity of 0.3 m/s or greater, temperatures between 17°C to 19°C and total dissolved solids less than <0.18 ppt. Juvenile striped bass stay near shore and gradually venture further into areas with higher salinity. Striped bass are rarely observed further than six to eight km from shore. (Bain et al., 1982) and forage within non-natal estuaries throughout the summer before overwintering in estuaries and rivers (Hogans and Melvin, 1984).

**Rainbow smelt (*Osmerus mordax*):** Rainbow smelt are anadromous with some landlocked populations. They are a schooling fish and inhabit pelagic zones of oceans and lakes. Smelt prefer deep, cold waters with pH levels greater than 6 (Evans and Loftus, 1987). Spawning typically occurs in swift moving riffles or runs of rivers in April and May after the ice melt, with water temperatures between 4 and 9°C (Buckley, 1989). Their adhesive eggs are released into the current and immediately stick to whatever substrate they contact. Afterwards, anadromous spawning adults return to the ocean where they spend the summer feeding. Rainbow smelt are highly sensitive to

increasing temperatures and salinities, hence any increase in these conditions could have negative effects on reproduction and survival of larvae (Unanian and Soin, 1963). Smelt are fished commercially using hoop nets, and recreationally by dip-netting and jigging with hooks through the ice in estuaries where anadromous populations overwinter (CRI, 2014; Spares et al., 2014).

The Lake Utopia smelt (dwarf and large-bodied) are unique populations of rainbow smelt. Populations are thought to be in decline due to surrounding development such as forestry, pulp mills, aquaculture, residential areas, linear developments, and hydro dams. Only the dwarf population is currently listed under SARA (Schedule 1) (DFO, 2016).

### **5.10 Archaeological and Heritage Resources**

For the next phase of the EIA process, we will consult with Archaeological Services Branch to determine the archeological potential in the area of the proposed Well development.

## CHAPTER 6 CLOSURE

The services performed as described in this report were conducted in a manner consistent with the level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

This report provides a professional opinion and therefore no warranty is expressed, implied, or made as to the conclusions, advice, and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, it should be noted that regulatory statutes and interpretation of regulatory statutes are subject to change.

Please feel free to contact the undersigned at your convenience, if you have any questions or require additional information.

Yours truly,

CBCL Limited



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APPENDIX A

# Initial WSSA Application



**CBCL LIMITED**

Consulting Engineers

September 19, 2017

Mr. David Maguire  
Department of Environment and Local Government  
Environmental Assessment Section  
P.O. Box 6000  
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Dear Mr. Maguire:

*RE: Water Supply Source Assessment, Initial Application  
Town of Saint George Water Supply Development*

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**Solving  
today's  
problems  
with  
tomorrow  
in mind**

CBCL Limited has been retained by the Town of St. George to investigate the potential to locate a new groundwater source, and to improve access to groundwater allocated under the current Approval to Operate.

**Objective**

The Town of St. George is seeking to augment and improve its existing groundwater supply system. The existing network of wells is adequate to supply the Town's existing demand but due to limited well performance and anticipated potential increased demand from commercial/industrial customers, the Town is seeking to improve redundancy and investigate the potential for improved capacity.

**Background**

St. George is serviced by two well fields with four (4) production wells that provided an average of 1670 m<sup>3</sup>/day to the Town between 2010 and 2013. Table 1 shows permitted pumping rates for each well. Production well PW5 was essentially removed from service after excessive drawdown led to poor yields in 2014. The effective combined maximum rate of extraction for the two well fields is on the order of 3500 m<sup>3</sup>/day (based on estimates of the sustainable pumping rate from aquifer tests). This indicates that there is potential for the existing well fields to produce up to 1800 m<sup>3</sup>/day of additional groundwater. Figure 1 shows the two well fields that serve the Town.

**Table 1 Permitted Pumping Rates**

	igpm	m <sup>3</sup> /day	Hours	Well Field
<b>PW2</b>	150	982	(24 hr)	Magaguadavic
<b>PW3</b>	150	982	(24 hr)	
<b>PW4</b>	240	1571	(24 hr)	Lake Utopia
<b>PW5</b>	110	360	12 hr/d	

- Total Permitted volume: 3895 m<sup>3</sup>/day.
- Average Use 2010 to 2013: 1670 m<sup>3</sup>/day.
- Peak Use 2010 to 2013: 1893 m<sup>3</sup>/day.
- Potential available capacity: 1800 m<sup>3</sup>/day.

Work in 2014 suggested that some of the well screens had become partially blocked by galvanic corrosion. This can occur when stray voltage reaches the well casing through faulty or aging wiring to the well. Costs for well rehabilitation were prohibitive due to the strong acids that would be needed to remove this type of scale.





**CBCL LIMITED**

Consulting Engineers

**Mr. David Maguire**  
September 19, 2017  
Page 2 of 4

Aggregate mapping shown in Figure 1 provides a delineation of the sand and gravel aquifers that serve the Town (shown as 'Ice Contact Delta'). Sand and gravel deposits have been subdivided into two major groundwater catchment areas:

- The Magaguadavic aquifer, a confined valley deposit of sand and gravel associated with the Magaguadavic River, running from north to south through the study area; and
- The Lake Utopia aquifer, an unconfined valley deposit of sand and gravel, running from Lake Utopia in the east to the outlet of the Magaguadavic River in the west.

Borehole logs from the Town wells and private wells in the St. George area indicate that the thickness of both aquifers may reach up to 30 metres in places. The Lake Utopia aquifer is bounded to the south by a bedrock ridge that is overlain in places by significant thicknesses of sandy kame or till material. The depositional environment suggests that each aquifer is thickest in the centre and thins toward its margins. The underlying bedrock is primarily crystalline fractured rock generally associated with low permeabilities. Sandstone and conglomerate to the north of the Magaguadavic aquifer could exhibit higher permeabilities and contribute a component of deeper flow to the surficial aquifer. Bedrock contacts are oriented from west to east across the study area.

### **Feasibility Study**

CBCL completed a feasibility study to identify potential options to increase production from the rates as indicated by usage data. Options included the installation of new wells in the existing Magaguadavic and Lake Utopia aquifers, or in other mapped deposits of granular material further to the south within the Town boundaries. The feasibility study included a thorough review of reporting on a 3D groundwater flow model of the area (Stantec, 2012). Other study tasks included review and establishment of site selection criteria, identification and mapping of potential contaminant sources, site reconnaissance, and conceptual modelling to evaluate the potential catchment for potential well locations. A letter report describing this work is available upon request.

Geotechnical work was completed as a follow-up to the feasibility study. Seven boreholes were advanced to show the depth and thickness of granular material at each location, and to identify confining units. In cases where granular material was encountered, a monitoring well was installed to allow for collection of a water sample. Six boreholes were advanced using continuous split spoons and augers. The seventh borehole, completed in the Magaguadavic aquifer, was advanced as a 6" cased borehole owing to the depth and nature of the material encountered. Figure 1 shows the locations of these boreholes. Additional reporting on this preliminary geotechnical work is available upon request.

### **Proposed Work Plan**

Limited thicknesses of granular material were encountered in boreholes BH1 through BH6. Borehole BH7 showed a 7 to 10 metre thick unit of sand and gravel overlain by a confining unit of marine clay. This setting is consistent with the results of previous drilling in the Magaguadavic aquifer. The Town wishes to pursue the possibility of installing a redundant well in the Magaguadavic aquifer, near the location of borehole BH7. The targeted pumping rate of a redundant well in this aquifer is up to 1310 m<sup>3</sup>/d (200 igpm). The addition of this well would help the Town to achieve pumping rates closer to the permitted capacity of the aquifer. We propose to use the existing borehole BH7 to complete a step test and collect water quality samples. Background water levels in the borehole would furthermore be monitored for one month using a data logger, to show any responses to pumping at PW2



and PW3. The results of this work would inform a decision on whether to proceed with a fully screened 8" to 10" production well, and an associated comprehensive aquifer testing program.

There are no anticipated contaminant sources or land uses of concern within 500 metres of the proposed drilling site. Several homes in the area may be heated using domestic fuel oil tanks, however, these homes fall within the existing source water area of two of the Town's existing wells. The Magaguadavic River is greater than 60 metres from the proposed location, and mapping shows a stream approximately 15 metres to the north of this location. Site reconnaissance and the presence at surface of a clay confining unit suggests that interaction of the confined aquifer with this water course would likely be minimal. Table 2 provides a summary of the Water Supply Source Assessment Initial Application. Figure 2 shows capture zones for the existing wells, based on the 3D groundwater flow model. Figure 3 shows the area within 500 metres of the proposed test site.

**Table 2 Water Supply Source Assessment Initial Application**

1)	<b>Name of Proponent</b>	Town of Saint George
	<b>Purpose of proposed water supply</b>	Municipal Supply
2)	<b>Property PID</b>	15101017
3)	<b>Required pumping rate</b>	7.6 to 15.2 L/s (100 to 200 igpm)
4)	<b>Alternate water supply sources</b>	Existing municipal wells, as indicated on Figure 1
5)	<b>Area Hydrogeology</b>	Briefly summarized above.
6)	<b>Proposed testing and work schedule</b>	September 25 to November 30, 2017 <ul style="list-style-type: none"> <li>Initial work to include logging of borehole material, 4 hr step test with recovery, water quality sample and background monitoring of aquifer response to existing pumping</li> <li>Longer term testing pending these results</li> </ul>
7)	<b>Existing contamination Hazards</b>	No significant hazards
8)	<b>Groundwater Use Problems in the area</b>	Active well field, no interference concerns; any aquifer testing to be coordinated with Town operators and carefully monitored
9)	<b>Watercourses within 60 metres of drilling site</b>	Local stream, shown on Figure 1
10)	<b>Supervisory Personnel</b>	Town of Saint George Works Superintendent: Leonard Lee
		CBCL Site Supervisor: Glen Porter
		CBCL Hydrogeologist: Colin Walker
		CBCL Project Manager: Amy Winchester
11)	<b>Mapping</b>	Drilling Firm: E.R. Steeves Drilling
		Figure 1 attached
12)	<b>Land use zoning map</b>	Figure 2 attached (Source Water Protection Zones)



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Mr. David Maguire  
September 19, 2017  
Page 4 of 4

13)	Contingency Plan	N/A
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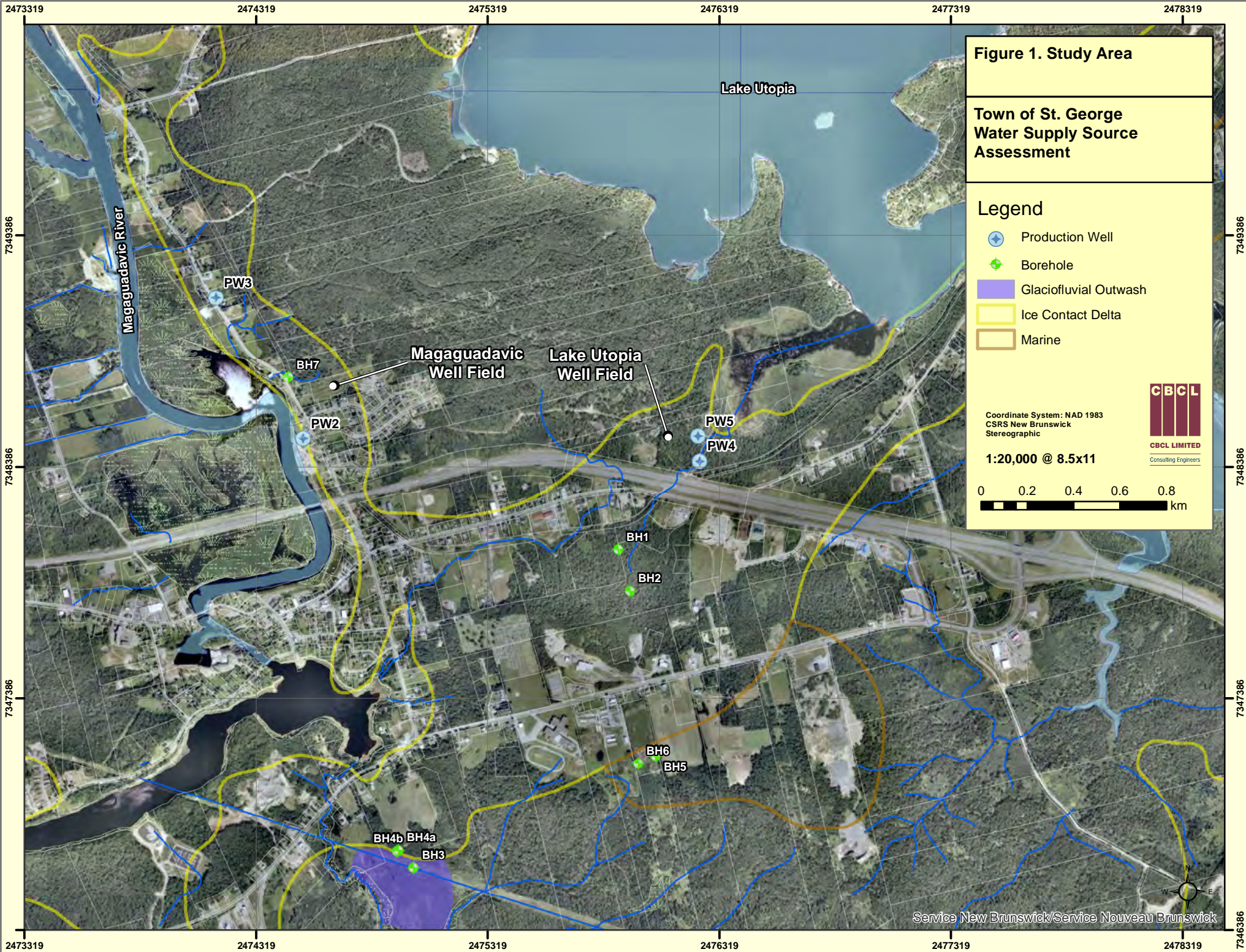
Yours very truly,

CBCL Limited

Colin Walker  
Hydrogeologist  
Direct: 902-421-7241  
E-Mail: colinw@cbcl.ca

Project No: 162862.00










**Figure 1. Study Area**

**Town of St. George  
Water Supply Source  
Assessment**

**Legend**

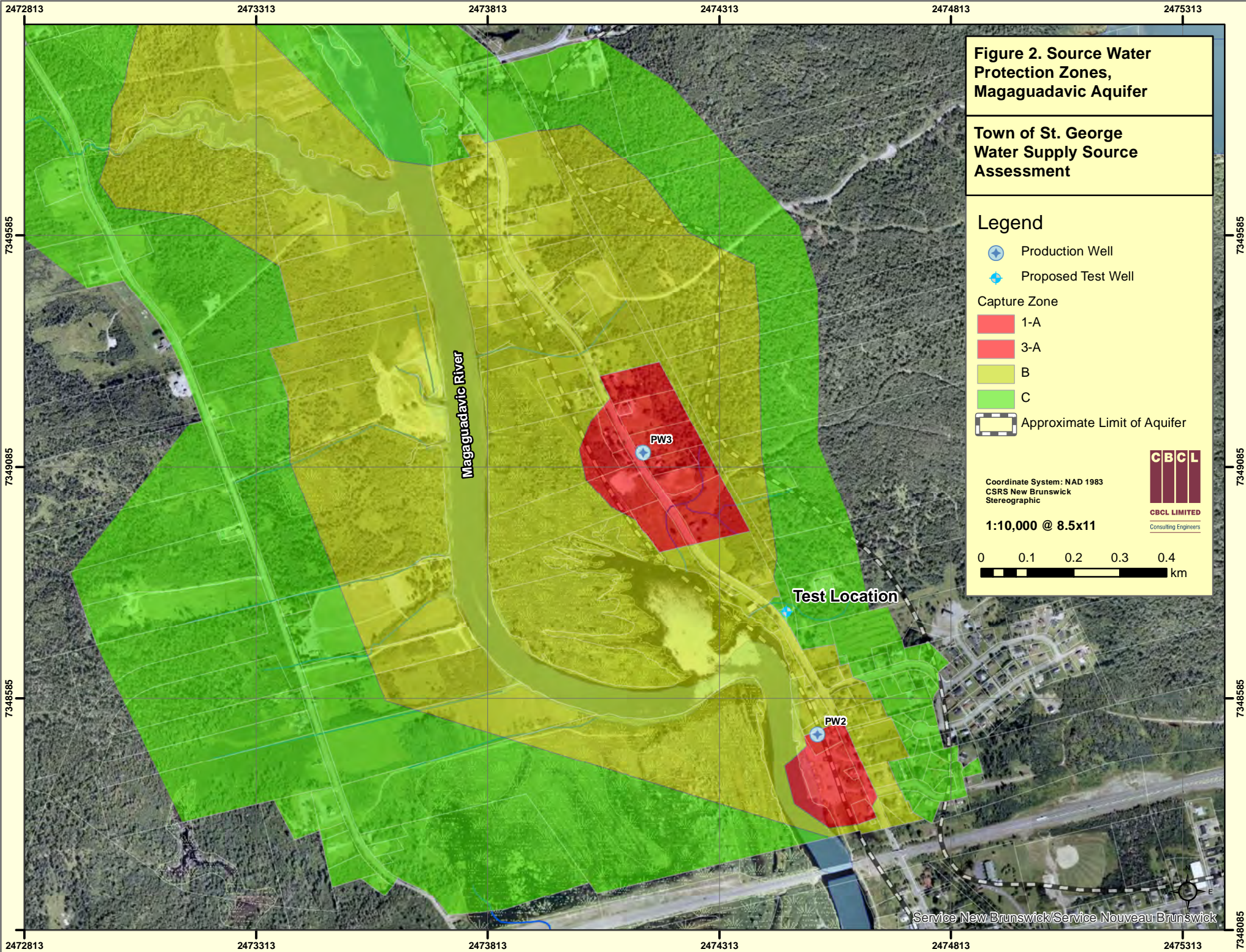
-  Production Well
-  Borehole
-  Glaciofluvial Outwash
-  Ice Contact Delta
-  Marine

Coordinate System: NAD 1983  
CSRS New Brunswick  
Stereographic

**1:20,000 @ 8.5x11**

0 0.2 0.4 0.6 0.8 km

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**Figure 2. Source Water Protection Zones, Magaguadavic Aquifer**

**Town of St. George Water Supply Source Assessment**

**Legend**

- Production Well
- Proposed Test Well

**Capture Zone**

- 1-A
- 3-A
- B
- C

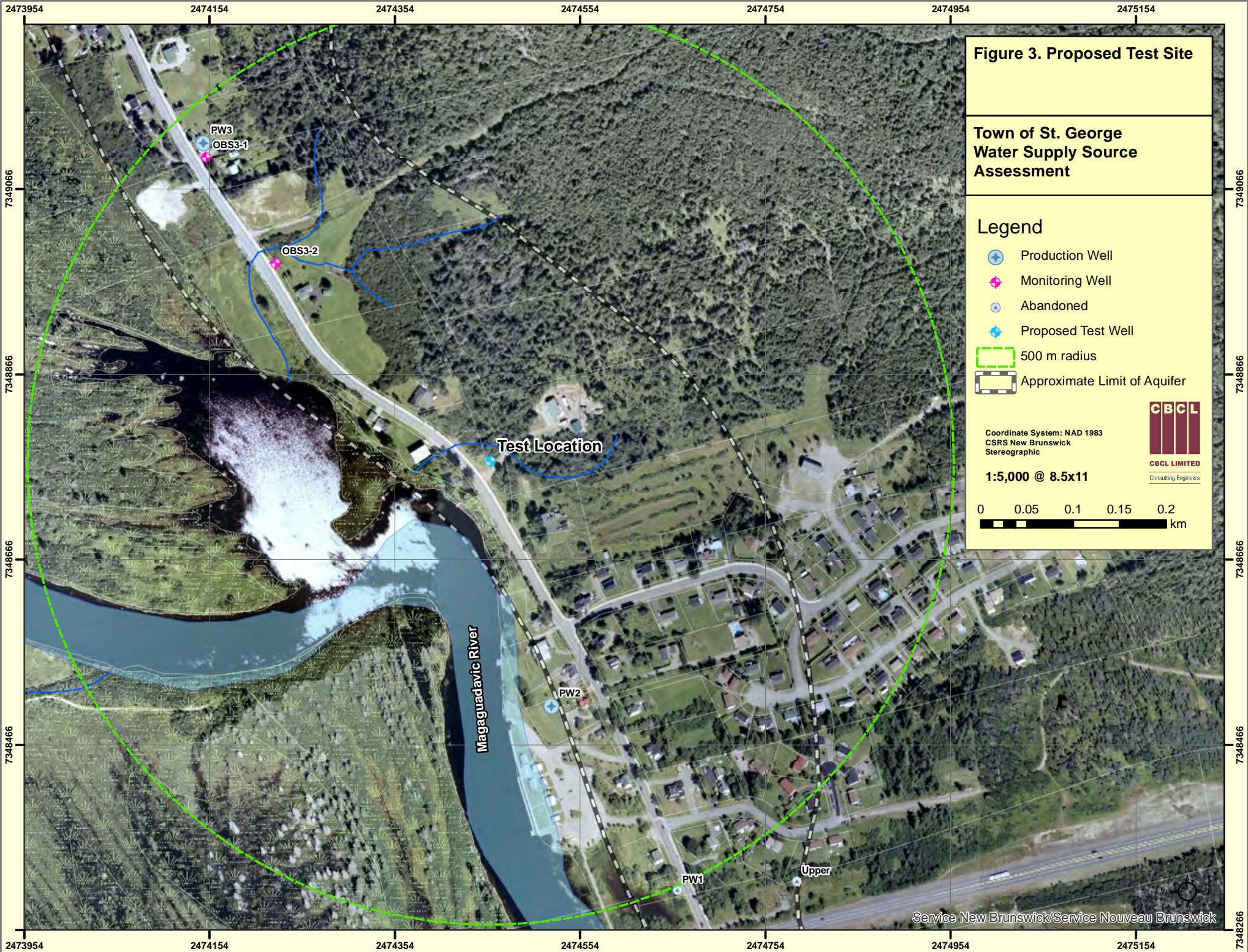
Approximate Limit of Aquifer

Coordinate System: NAD 1983  
 CSRS New Brunswick  
 Stereographic

**1:10,000 @ 8.5x11**

0 0.1 0.2 0.3 0.4 km







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**Figure 3. Proposed Test Site**

**Town of St. George  
Water Supply Source  
Assessment**

**Legend**

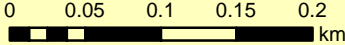
-  Production Well
-  Monitoring Well
-  Abandoned
-  Proposed Test Well
-  500 m radius
-  Approximate Limit of Aquifer

Coordinate System: NAD 1983  
 CSRS New Brunswick  
 Stereographic



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**1:5,000 @ 8.5x11**





APPENDIX B

# ACCDC Species Ranks



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## Understanding Ranks

### Sub-national (provincial) ranks (S-ranks)

Conservation Data Centres and NatureServe use existing information and expertise, for ranking species rarity or conservation status. Ranks help them identify gaps in knowledge for species for which element occurrence data are maintained; typically information is maintained for species ranked critically imperiled (S1) to vulnerable (S3) in given jurisdictions. Individual CDCs are responsible for developing sub-national ranks for their area. The AC CDC works with provincial and federal experts to develop rarity ranks for species in each of the following provinces: New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland & Labrador. Factors considered when ranking include: number of element occurrences, distribution, population size, abundance trends, and threats.

### Sub-national element rank definitions

The following definitions refer to species and community ranks at sub-national (provincial) levels. Sub-national ranks are specific to a province. Therefore, a species that is common (S4) in New Brunswick, could be ranked as extremely rare (S1) in Prince Edward Island.

S-rank	Definition
<b>SX</b>	<b>Presumed Extirpated</b> - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
<b>S1</b>	<b>Critically Imperiled</b> - Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
<b>S2</b>	<b>Imperiled</b> - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
<b>S3</b>	<b>Vulnerable</b> - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
<b>S4</b>	<b>Apparently Secure</b> - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
<b>S5</b>	<b>Secure</b> - Common, widespread, and abundant in the province.
<b>SNR</b>	<b>Unranked</b> - Nation or state/province conservation status not yet assessed.
<b>SU</b>	<b>Unrankable</b> - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
<b>SNA</b>	<b>Not Applicable</b> - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
<b>S#S#</b>	<b>Range Rank</b> - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
<b>Not Provided</b>	Species is not known to occur in the province.

### Breeding Status Qualifiers

Qualifier	Definition
<b>B</b>	<b>Breeding</b> - Conservation status refers to the breeding population of the species in the province.
<b>N</b>	<b>Nonbreeding</b> - Conservation status refers to the non-breeding population of the species in the province.
<b>M</b>	<b>Migrant</b> - Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

**Note:** A breeding status is only used for species that have distinct breeding and/or non-breeding populations in the province. A breeding-status S-rank can be coupled with its complementary non-breeding-status S-rank if the species also winters in the nation or state/province, and/or a migrant-status S-rank if the species occurs regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. The two (or rarely, three) status ranks are separated by a comma (e.g., "S2B, S3N" or "SHN, S4B, S1M").

### Other Qualifiers

Qualifier	Definition
<b>?</b>	<b>Inexact or Uncertain</b> - Denotes inexact or uncertain numeric rank. (The ? qualifies the character immediately preceding it in the S-rank.)

### National and Global Ranks

Information supporting S-ranks in turn supports broader-scale ranking, national (N-rank) and global (G-rank). Canadian CDCs, from the Atlantic to British Columbia, help develop and update N-ranks for Canadian plants and animals. Although many believe that National ranks offer great value, there is increasing interest in categories used by COSEWIC and General Status Assessments, outlined briefly below. Global ranks are assigned by staff specialists at NatureServe in consultation with CDC specialists and other science experts. Global rank definitions are similar to sub-national rank definitions but they refer to the entire range for species or communities regardless of national borders. For instance, G1= Critically Imperiled - extremely rare and extremely vulnerable to extinction due to natural or human causes (5 or fewer global occurrences or less than 1000 individuals), while G5 = Demonstrably secure. See the [NatureServe explorer](#) for additional details.

### COSEWIC and General Status of Wild Species

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) uses: extinct, extirpated, endangered, threatened, vulnerable, special concern, insufficient information, and secure to describe the status of species (but not communities) in Canada. The General Status of Wild Species in Canada, uses a ranking system similar to that used by NatureServe and all CDCs. (See [Wild Species: The General Status of Species in Canada](#) - for additional details).

Appendix C

# ACCDC Data Report 5943 St. George NB

# DATA REPORT 5943: Saint George, NB

Prepared 11 October 2017  
by J. Churchill, Data Manager

## CONTENTS OF REPORT

### 1.0 Preface

- 1.1 Data List
- 1.2 Restrictions
- 1.3 Additional Information
- Map 1: Buffered Study Area

### 2.0 Rare and Endangered Species

- 2.1 Flora
- 2.2 Fauna
- Map 2: Flora and Fauna

### 3.0 Special Areas

- 3.1 Managed Areas
- 3.2 Significant Areas
- Map 3: Special Areas

### 4.0 Rare Species Lists

- 4.1 Fauna
- 4.2 Flora
- 4.3 Location Sensitive Species
- 4.4 Source Bibliography

### 5.0 Rare Species within 100 km

- 5.1 Source Bibliography



**Map 1.** A 100 km buffer around the study area

## 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](http://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 LIST

Included datasets:

Filename	Contents
StGeorgeNB_5943ob.xls	All Rare and legally protected <i>Flora and Fauna</i> in your study area
StGeorgeNB_5943ob100km.xls	A list of Rare and legally protected <i>Flora and Fauna</i> within 100 km of your study area
StGeorgeNB_5943ma.xls	All <i>Managed Areas</i> in your study area
StGeorgeNB_5943sa.xls	All <i>Significant Natural Areas</i> in your study area
StGeorgeNB_5943ff.xls	Rare and common <i>Freshwater Fish</i> in your study area (DFO database)

## 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

[sblaney@mta.ca](mailto:sblaney@mta.ca)

### Animals (Fauna)

John Klymko, Zoologist

Tel: (506) 364-2660

[jklymko@mta.ca](mailto:jklymko@mta.ca)

### Plant Communities

Sarah Robinson, Community Ecologist

Tel: (506) 364-2664

[srobinson@mta.ca](mailto:srobinson@mta.ca)

### Data Management, GIS

James Churchill, Data Manager

Tel: (902) 679-6146

[jlchurchill@mta.ca](mailto:jlchurchill@mta.ca)

### Billing

Jean Breau

Tel: (506) 364-2657

[jrbreau@mta.ca](mailto: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](mailto:Duncan.Bayne@novascotia.ca)

**Western:** Donald Sam

(902) 634-7525

[Donald.Sam@novascotia.ca](mailto:Donald.Sam@novascotia.ca)

**Central:** Shavonne Meyer

(902) 893-6353

[Shavonne.Meyer@novascotia.ca](mailto:Shavonne.Meyer@novascotia.ca)

**Central:** Kimberly George

(902) 893-5630

[Kimberly.George@novascotia.ca](mailto:Kimberly.George@novascotia.ca)

**Eastern:** Mark Pulsifer

(902) 863-7523

[Mark.Pulsifer@novascotia.ca](mailto:Mark.Pulsifer@novascotia.ca)

**Eastern:** Donald Anderson

(902) 295-3949

[Donald.Anderson@novascotia.ca](mailto:Donald.Anderson@novascotia.ca)

**Eastern:** Terry Power

(902) 563-3370

[Terrance.Power@novascotia.ca](mailto:Terrance.Power@novascotia.ca)

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

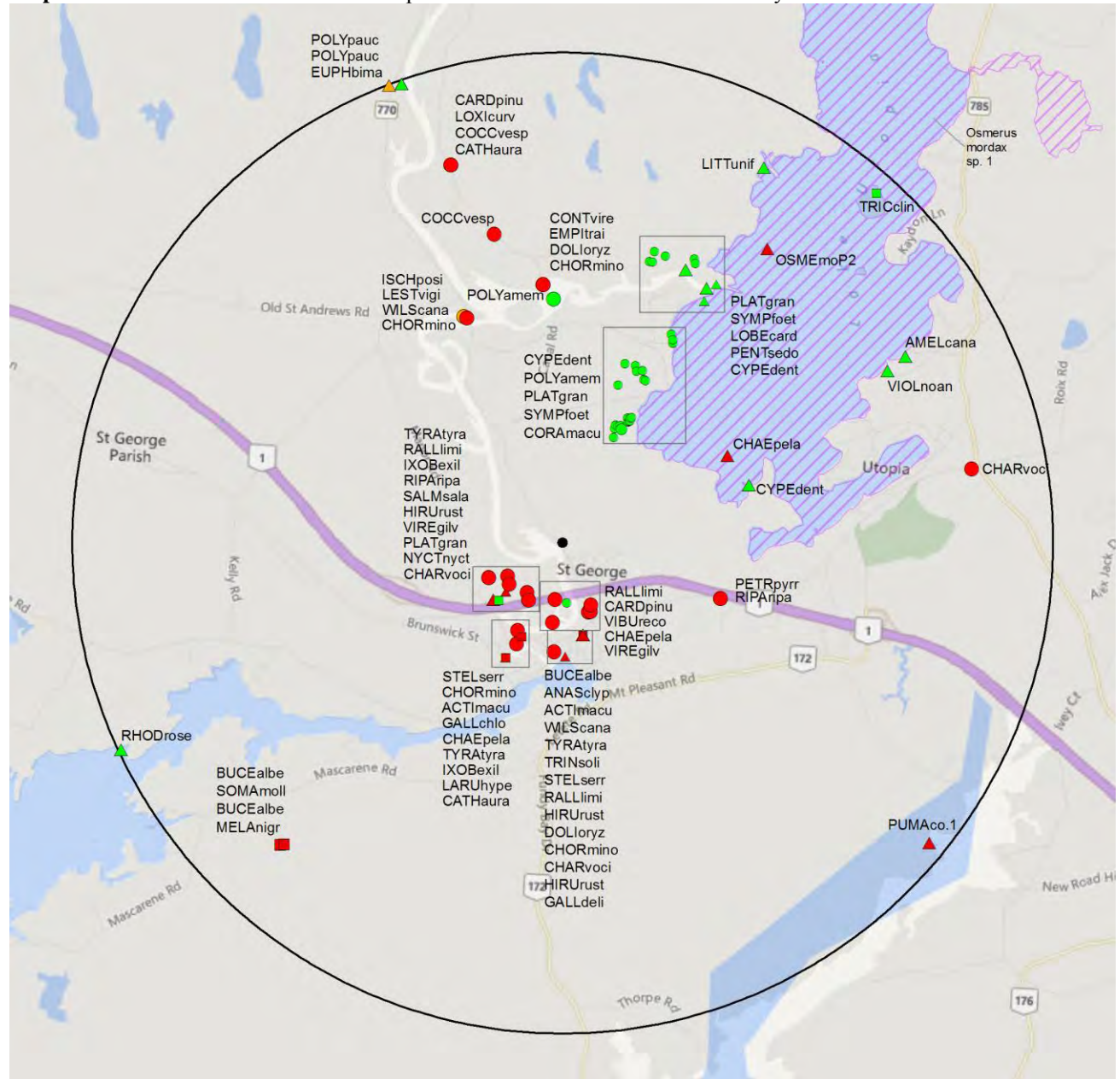
### 2.1 FLORA

The study area contains 52 records of 14 vascular, no records of nonvascular flora (Map 2 and attached: \*ob.xls).

### 2.2 FAUNA

The study area contains 92 records of 32 vertebrate, 5 records of 3 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.



#### RESOLUTION

- 4.7 within 50s of kilometers
- 4.0 within 10s of kilometers
- 3.7 within 5s of kilometers
- △ 3.0 within kilometers
- △ 2.7 within 500s of meters
- ◇ 2.0 within 100s of meters
- ◇ 1.7 within 10s of meters

#### HIGHER TAXON

- vertebrate fauna
- invertebrate fauna
- vascular flora
- nonvascular flora

### 3.0 SPECIAL AREAS

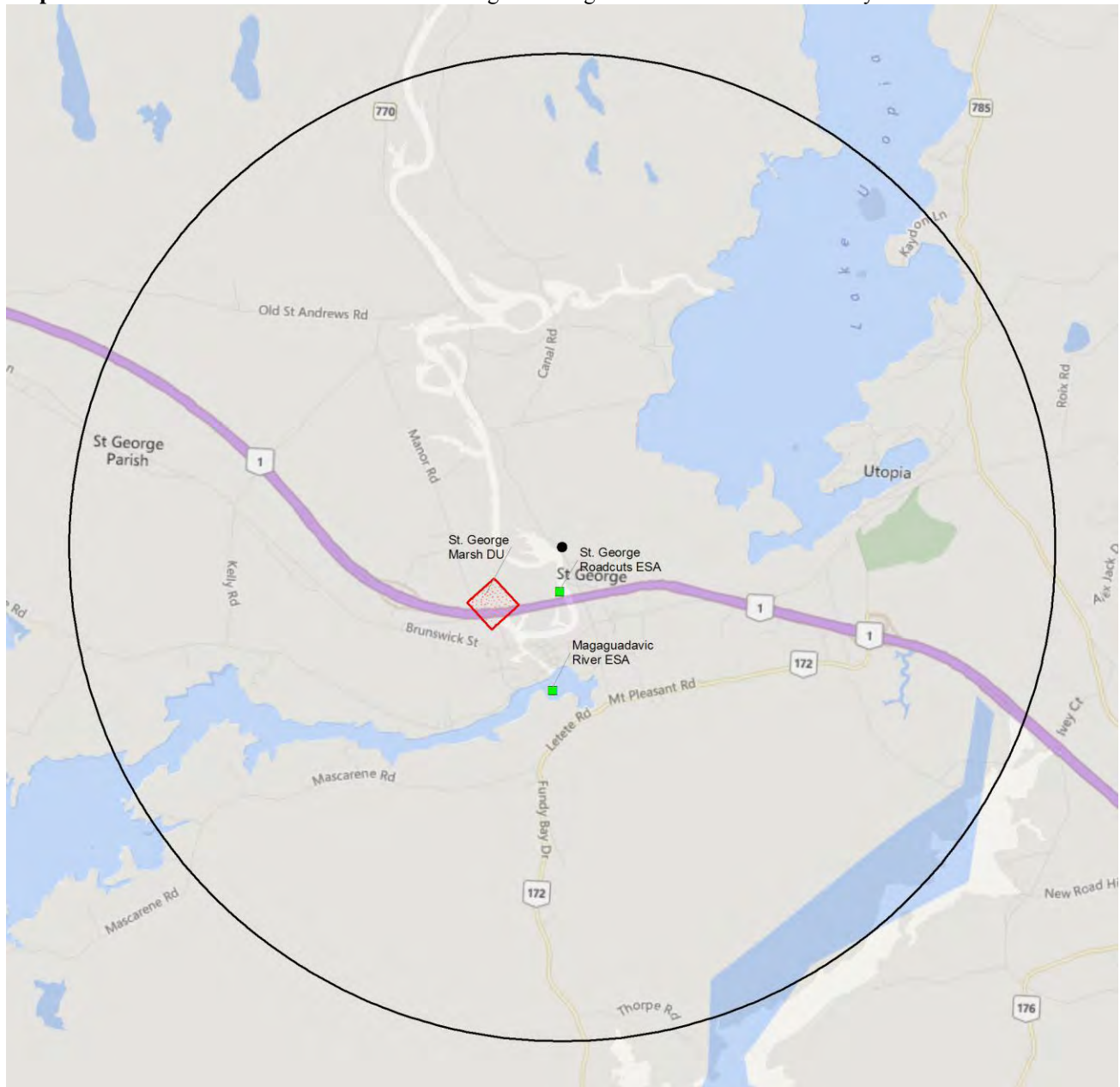
#### 3.1 MANAGED AREAS

The GIS scan identified 1 managed area in the vicinity of the study area (Map 3 and attached file: \*ma\*.xls).

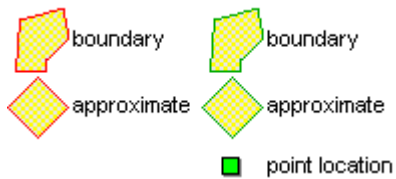
#### 3.2 SIGNIFICANT AREAS

The GIS scan identified 2 biologically significant sites 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.



#### MANAGED AREAS SIGNIFIGANT AREAS





## 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)
P	<i>Viburnum recognitum</i>	Northern Arrow-Wood				S2	4 Secure	1	0.6 $\pm$ 0.0
P	<i>Polygala paucifolia</i>	Fringed Milkwort				S2	3 Sensitive	2	5.0 $\pm$ 1.0
P	<i>Polygonum amphibium</i> var. <i>emersum</i>	Water Smartweed				S2	3 Sensitive	2	1.4 $\pm$ 0.0
P	<i>Viola novae-angliae</i>	New England Violet				S2	3 Sensitive	1	3.7 $\pm$ 1.0
P	<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage				S2	3 Sensitive	25	1.3 $\pm$ 0.0
P	<i>Lobelia cardinalis</i>	Cardinal Flower				S3	4 Secure	1	3.1 $\pm$ 0.0
P	<i>Rhodiola rosea</i>	Roseroot				S3	4 Secure	1	5.0 $\pm$ 1.0
P	<i>Penthorum sedoides</i>	Ditch Stonecrop				S3	4 Secure	1	3.0 $\pm$ 0.0
P	<i>Littorella uniflora</i>	American Shoreweed				S3	4 Secure	1	4.3 $\pm$ 1.0
P	<i>Amelanchier canadensis</i>	Canada Serviceberry				S3	4 Secure	1	4.0 $\pm$ 1.0
P	<i>Cyperus dentatus</i>	Toothed Flatsedge				S3	4 Secure	4	2.0 $\pm$ 1.0
P	<i>Trichophorum clintonii</i>	Clinton's Clubrush				S3	4 Secure	1	4.8 $\pm$ 5.0
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	3 Sensitive	10	0.9 $\pm$ 5.0
P	<i>Corallorhiza maculata</i>	Spotted Coralroot				S3S4	3 Sensitive	1	1.2 $\pm$ 0.0

### 4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Ixobrychus exilis</i>	Least Bittern	Threatened	Threatened	Threatened	S1S2B,S1S2M	1 At Risk	3	0.7 $\pm$ 0.0
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Threatened	S2B,S2M	3 Sensitive	4	0.8 $\pm$ 0.0
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Threatened	S2S3B,S2M	1 At Risk	9	0.7 $\pm$ 0.0
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S2S3B,S2S3M	3 Sensitive	2	0.8 $\pm$ 0.0
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Threatened	S3B,S3M	1 At Risk	2	1.0 $\pm$ 2.0
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Threatened	S3B,S3M	3 Sensitive	3	1.0 $\pm$ 2.0
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S3B,S4M	1 At Risk	6	1.0 $\pm$ 0.0
A	<i>Osmerus mordax</i> pop. 2	Lake Utopia Smelt large-bodied pop.	Threatened		Threatened			1	3.7 $\pm$ 1.0
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern			S3B,S3S4N,SUM	3 Sensitive	2	3.2 $\pm$ 0.0
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Special Concern	S4B,S4M	4 Secure	1	2.6 $\pm$ 0.0
A	<i>Puma concolor</i> pop. 1	Eastern Cougar	Data Deficient		Endangered	SU	5 Undetermined	1	4.8 $\pm$ 1.0
A	<i>Gallinula chloropus</i>	Common Moorhen				S1B,S1M	3 Sensitive	1	1.0 $\pm$ 5.0
A	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1S2B,S1S2M	3 Sensitive	1	0.7 $\pm$ 0.0
A	<i>Empidonax traillii</i>	Willow Flycatcher				S1S2B,S1S2M	3 Sensitive	1	2.6 $\pm$ 0.0
A	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow				S1S2B,S1S2M	2 May Be At Risk	2	1.0 $\pm$ 2.0
A	<i>Tringa solitaria</i>	Solitary Sandpiper				S2B,S5M	4 Secure	1	1.0 $\pm$ 2.0
A	<i>Larus hyperboreus</i>	Glaucous Gull				S2N,S2M	4 Secure	1	1.3 $\pm$ 0.0
A	<i>Salmo salar</i>	Atlantic Salmon				S2S3	2 May Be At Risk	1	0.9 $\pm$ 1.0
A	<i>Anas clypeata</i>	Northern Shoveler				S2S3B,S2S3M	4 Secure	1	1.0 $\pm$ 4.0
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B,S2S3M	3 Sensitive	1	1.7 $\pm$ 0.0
A	<i>Loxia curvirostra</i>	Red Crossbill				S3	4 Secure	1	4.0 $\pm$ 0.0
A	<i>Carduelis pinus</i>	Pine Siskin				S3	4 Secure	3	0.8 $\pm$ 0.0
A	<i>Cathartes aura</i>	Turkey Vulture				S3B,S3M	4 Secure	2	1.3 $\pm$ 6.0
A	<i>Rallus limicola</i>	Virginia Rail				S3B,S3M	3 Sensitive	9	0.6 $\pm$ 0.0
A	<i>Charadrius vociferus</i>	Killdeer				S3B,S3M	3 Sensitive	4	0.7 $\pm$ 0.0
A	<i>Vireo gilvus</i>	Warbling Vireo				S3B,S3M	4 Secure	2	0.6 $\pm$ 0.0
A	<i>Somateria mollissima</i>	Common Eider				S3B,S4M,S3N	4 Secure	6	4.2 $\pm$ 16.0

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Melanitta nigra</i>	Black Scoter				S3M,S1S2N	3 Sensitive	2	4.2 ± 16.0
A	<i>Bucephala albeola</i>	Bufflehead				S3M,S2N	3 Sensitive	9	1.2 ± 0.0
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3S4B,S3S4M	3 Sensitive	7	0.8 ± 0.0
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B,S5M	4 Secure	2	1.0 ± 4.0
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3S4B,S5M	4 Secure	1	1.0 ± 1.0
I	<i>Ischnura posita</i>	Fragile Forktail				S2	2 May Be At Risk	2	2.5 ± 0.0
I	<i>Euphyes bimaculata</i>	Two-spotted Skipper				S3	4 Secure	2	5.0 ± 1.0
I	<i>Lestes vigilax</i>	Swamp Spreadwing				S3	3 Sensitive	1	2.5 ± 0.0

### 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?
<i>Chrysemys picta picta</i>	Eastern Painted Turtle			No
<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	No
<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	No
<b><i>Haliaeetus leucocephalus</i></b>	<b>Bald Eagle</b>		<b>Endangered</b>	<b>YES</b>
<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Endangered	No
<i>Cicindela marginipennis</i>	Cobblestone Tiger Beetle	Endangered	Endangered	No
<i>Coenonympha nipisiquit</i>	Maritime Ringlet	Endangered	Endangered	No
<i>Bat Hibernaculum</i>		[Endangered] <sup>1</sup>	[Endangered] <sup>1</sup>	No

<sup>1</sup> *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
39	eBird. 2014. eBird Basic Dataset. Version: EBD_relNov-2014. Ithaca, New York. Nov 2014. Cornell Lab of Ornithology, 25036 recs.
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7	Benedict, B. Connell Herbarium Specimens (Data) . University New Brunswick, Fredericton. 2003.
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1	Atlantic Canada Conservation Area Database (ARCAD)
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# recs	CITATION
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1	Mills, E. Connell Herbarium Specimens, 1957-2009. University New Brunswick, Fredericton. 2012.
1	Scott, Fred W. 1998. Updated Status Report on the Cougar (Puma Concolor cougar) [ Eastern population]. Committee on the Status of Endangered Wildlife in Canada, 298 recs.

## 5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 30314 records of 145 vertebrate and 959 records of 76 invertebrate fauna; 5693 records of 344 vascular, 189 records of 93 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	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	60	35.8 $\pm$ 5.0	NB
A	<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	14	50.4 $\pm$ 1.0	NB
A	<i>Perimyotis subflavus</i>	Eastern Pipistrelle	Endangered	Endangered	Endangered	S1	1 At Risk	2	56.7 $\pm$ 0.0	NB
A	<i>Eubalaena glacialis</i>	North Atlantic Right Whale	Endangered	Endangered	Endangered	S1		6	17.6 $\pm$ 1.0	NB
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1?B,S1?M	1 At Risk	21	13.5 $\pm$ 0.0	NB
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B,S1M	1 At Risk	24	27.8 $\pm$ 0.0	NB
A	<i>Dermochelys coriacea</i> (Atlantic pop.)	Leatherback Sea Turtle - Atlantic pop.	Endangered	Endangered	Endangered	S1S2N	1 At Risk	4	35.4 $\pm$ 0.0	NB
A	<i>Salmo salar</i> pop. 1	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered	Endangered	S2	2 May Be At Risk	6	22.6 $\pm$ 0.0	NB
A	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered		Endangered	S2M	1 At Risk	379	18.7 $\pm$ 0.0	NB
A	<i>Rangifer tarandus</i> pop. 2	Woodland Caribou (Atlantic-Gasp [r-sie pop.]	Endangered	Endangered	Extirpated	SX	0.1 Extirpated	4	42.8 $\pm$ 1.0	NB
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened		Threatened	S1B,S1M	2 May Be At Risk	23	15.9 $\pm$ 7.0	NB
A	<i>Ixobrychus exilis</i>	Least Bittern	Threatened	Threatened	Threatened	S1S2B,S1S2M	1 At Risk	28	0.7 $\pm$ 0.0	NB
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened		Threatened	S1S2B,S1S2M	2 May Be At Risk	156	7.4 $\pm$ 7.0	NB
A	<i>Caprimulgus vociferus</i>	Whip-Poor-Will	Threatened	Threatened	Threatened	S2B,S2M	1 At Risk	68	7.4 $\pm$ 7.0	NB
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Threatened	S2B,S2M	3 Sensitive	978	0.8 $\pm$ 0.0	NB
A	<i>Catharus bicknelli</i>	Bicknell's Thrush	Threatened	Special Concern	Threatened	S2B,S2M	1 At Risk	21	6.9 $\pm$ 7.0	NB
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2S3	1 At Risk	59	22.7 $\pm$ 0.0	NB
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Threatened	S2S3B,S2M	1 At Risk	246	0.7 $\pm$ 0.0	NB
A	<i>Riparia riparia</i>	Bank Swallow	Threatened		Threatened	S2S3B,S2S3M	3 Sensitive	301	0.8 $\pm$ 0.0	NB
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened		Threatened	S3	4 Secure	1	61.5 $\pm$ 1.0	NB
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B,S3M	1 At Risk	213	6.9 $\pm$ 7.0	NB
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Threatened	S3B,S3M	1 At Risk	606	1.0 $\pm$ 2.0	NB
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Threatened	S3B,S3M	3 Sensitive	464	1.0 $\pm$ 2.0	NB
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S3B,S4M	1 At Risk	237	1.0 $\pm$ 2.0	NB
A	<i>Anguilla rostrata</i>	American Eel	Threatened		Threatened	S4	4 Secure	36	17.9 $\pm$ 1.0	NB
A	<i>Osmerus mordax</i> pop. 2	Lake Utopia Smelt large-bodied pop.	Threatened		Threatened			2	3.7 $\pm$ 1.0	NB
A	<i>Coturnicops noveboracensis</i>	Yellow Rail	Special Concern	Special Concern	Special Concern	S1?B,SUM	2 May Be At Risk	3	91.9 $\pm$ 7.0	NB
A	<i>Histrionicus histrionicus</i> pop. 1	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S1B,S1S2N,S2M	1 At Risk	205	20.6 $\pm$ 0.0	NB
A	<i>Falco peregrinus</i> pop. 1	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Endangered	S1B,S3M	1 At Risk	544	11.0 $\pm$ 1.0	NB
A	<i>Asio flammeus</i>	Short-eared Owl	Special Concern	Special Concern	Special Concern	S2B,S2M	3 Sensitive	17	45.9 $\pm$ 7.0	NB
A	<i>Bucephala islandica</i>	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern	Special Concern	S2M,S2N	3 Sensitive	56	11.0 $\pm$ 1.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	(Eastern pop.) <i>Balaenoptera physalus</i>	Fin Whale - Atlantic pop.	Special Concern	Special Concern	Special Concern	S2S3		5	46.8 ± 1.0	NB
A	<i>Acipenser brevirostrum</i>	Shortnose Sturgeon	Special Concern	Special Concern	Special Concern	S3	3 Sensitive	7	55.7 ± 10.0	NB
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Special Concern	S3	3 Sensitive	26	19.0 ± 1.0	NB
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Special Concern	S3B,S3M	2 May Be At Risk	110	6.9 ± 7.0	NB
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern			S3B,S3S4N,SUM	3 Sensitive	151	3.2 ± 0.0	NB
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern			S3M	3 Sensitive	221	9.0 ± 0.0	NB
A	<i>Phocoena phocoena</i> (NW Atlantic pop.)	Harbour Porpoise - Northwest Atlantic pop.	Special Concern	Threatened		S4		229	7.9 ± 5.0	NB
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Special Concern	S4B,S4M	4 Secure	391	2.6 ± 0.0	NB
A	<i>Podiceps auritus</i>	Horned Grebe	Special Concern		Special Concern	S4N,S4M	4 Secure	268	9.1 ± 0.0	NB
A	<i>Bubo scandiacus</i>	Snowy Owl	Not At Risk			S1N,S2S3M	4 Secure	30	21.3 ± 0.0	NB
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1S2B,S1S2M	2 May Be At Risk	16	54.5 ± 1.0	NB
A	<i>Fulica americana</i>	American Coot	Not At Risk			S1S2B,S1S2M	3 Sensitive	4	6.9 ± 7.0	NB
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S1S2B,SUM	2 May Be At Risk	5	46.0 ± 1.0	NB
A	<i>Sorex dispar</i>	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	2	61.5 ± 1.0	NB
A	<i>Buteo lineatus</i>	Red-shouldered Hawk	Not At Risk	Special Concern		S2B,S2M	2 May Be At Risk	48	13.9 ± 0.0	NB
A	<i>Chlidonias niger</i>	Black Tern	Not At Risk			S2B,S2M	3 Sensitive	136	52.1 ± 7.0	NB
A	<i>Globicephala melas</i>	Long-finned Pilot Whale	Not At Risk			S2S3		3	22.9 ± 1.0	NB
A	<i>Lynx canadensis</i>	Canadian Lynx	Not At Risk		Endangered	S3	1 At Risk	7	21.6 ± 50.0	NB
A	<i>Desmognathus fuscus</i>	Northern Dusky Salamander	Not At Risk			S3	3 Sensitive	80	22.9 ± 1.0	NB
A	<i>Megaptera novaeangliae</i>	Humpback Whale (NW Atlantic pop.)	Not At Risk	Special Concern		S3		4	17.6 ± 5.0	NB
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B,SUM	3 Sensitive	307	13.5 ± 0.0	NB
A	<i>Podiceps grisegena</i>	Red-necked Grebe	Not At Risk			S3M,S2N	3 Sensitive	673	8.8 ± 0.0	NB
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4		1	64.7 ± 1.0	NB
A	<i>Haliaeetus leucocephalus</i>	Bald Eagle	Not At Risk		Endangered	S4	1 At Risk	1377	0.8 ± 0.0	NB
A	<i>Canis lupus</i>	Gray Wolf	Not At Risk		Extirpated	SX	0.1 Extirpated	3	51.2 ± 1.0	NB
A	<i>Puma concolor pop. 1</i>	Eastern Cougar	Data Deficient		Endangered	SU	5 Undetermined	40	4.8 ± 1.0	NB
A	<i>Morone saxatilis</i>	Striped Bass	E,E,SC			S3	2 May Be At Risk	10	22.5 ± 1.0	NB
A	<i>Vireo flavifrons</i>	Yellow-throated Vireo				S1?B,S1?M	8 Accidental	16	42.1 ± 27.0	NB
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S1?B,S5M	4 Secure	924	10.5 ± 0.0	NB
A	<i>Aythya americana</i>	Redhead				S1B,S1M	8 Accidental	4	40.5 ± 0.0	NB
A	<i>Gallinula chloropus</i>	Common Moorhen				S1B,S1M	3 Sensitive	18	1.0 ± 5.0	NB
A	<i>Grus canadensis</i>	Sandhill Crane				S1B,S1M	8 Accidental	7	21.3 ± 0.0	NB
A	<i>Bartramia longicauda</i>	Upland Sandpiper				S1B,S1M	3 Sensitive	47	5.9 ± 7.0	NB
A	<i>Phalaropus tricolor</i>	Wilson's Phalarope				S1B,S1M	3 Sensitive	58	34.8 ± 1.0	NB
A	<i>Leucophaeus atricilla</i>	Laughing Gull				S1B,S1M	3 Sensitive	87	10.8 ± 0.0	NB
A	<i>Progne subis</i>	Purple Martin				S1B,S1M	2 May Be At Risk	185	19.7 ± 0.0	NB
A	<i>Thryothorus ludovicianus</i>	Carolina Wren				S1B,S1M	8 Accidental	35	7.5 ± 0.0	NB
A	<i>Oxyura jamaicensis</i>	Ruddy Duck				S1B,S2S3M	4 Secure	48	19.5 ± 0.0	NB
A	<i>Uria aalge</i>	Common Murre				S1B,S3N,S3M	4 Secure	145	11.9 ± 0.0	NB
A	<i>Aythya affinis</i>	Lesser Scaup				S1B,S4M	4 Secure	203	27.2 ± 2.0	NB
A	<i>Aythya marila</i>	Greater Scaup				S1B,S4M,S2N	4 Secure	34	19.3 ± 2.0	NB
A	<i>Eremophila alpestris</i>	Horned Lark				S1B,S4N,S5M	2 May Be At Risk	23	9.1 ± 7.0	NB
A	<i>Sterna paradisaea</i>	Arctic Tern				S1B,SUM	2 May Be At Risk	149	11.0 ± 1.0	NB
A	<i>Fratercula arctica</i>	Atlantic Puffin				S1B,SUN,SUM	3 Sensitive	186	11.0 ± 1.0	NB
A	<i>Branta bernicla</i>	Brant				S1N, S2S3M	4 Secure	541	10.5 ± 1.0	NB
A	<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S1N,S2M	3 Sensitive	40	9.7 ± 0.0	NB
A	<i>Butorides virescens</i>	Green Heron				S1S2B,S1S2M	3 Sensitive	22	26.4 ± 7.0	NB
A	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1S2B,S1S2M	3 Sensitive	62	0.7 ± 0.0	NB
A	<i>Empidonax traillii</i>	Willow Flycatcher				S1S2B,S1S2M	3 Sensitive	74	2.6 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow				S1S2B,S1S2M	2 May Be At Risk	25	1.0 ± 2.0	NB
A	<i>Troglodytes aedon</i>	House Wren				S1S2B,S1S2M	5 Undetermined	32	6.5 ± 0.0	NB
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S1S2B,S4N,S5M	4 Secure	49	14.2 ± 0.0	NB
A	<i>Calidris bairdii</i>	Baird's Sandpiper				S1S2M	3 Sensitive	102	34.3 ± 1.0	NB
A	<i>Cistothorus palustris</i>	Marsh Wren				S2B,S2M	3 Sensitive	86	39.3 ± 0.0	NB
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S2B,S2M	3 Sensitive	134	6.8 ± 7.0	NB
A	<i>Toxostoma rufum</i>	Brown Thrasher				S2B,S2M	3 Sensitive	75	5.9 ± 7.0	NB
A	<i>Poocetes gramineus</i>	Vesper Sparrow				S2B,S2M	2 May Be At Risk	55	5.4 ± 7.0	NB
A	<i>Anas strepera</i>	Gadwall				S2B,S3M	4 Secure	86	19.3 ± 3.0	NB
A	<i>Alca torda</i>	Razorbill				S2B,S3N,S3M	4 Secure	181	11.9 ± 0.0	NB
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S2B,S4S5N,S4S5M	3 Sensitive	21	21.7 ± 7.0	NB
A	<i>Tringa solitaria</i>	Solitary Sandpiper				S2B,S5M	4 Secure	250	1.0 ± 2.0	NB
A	<i>Oceanodroma leucorhoa</i>	Leach's Storm-Petrel				S2B,SUM	3 Sensitive	140	13.5 ± 0.0	NB
A	<i>Chen caerulescens</i>	Snow Goose				S2M	4 Secure	6	46.4 ± 0.0	NB
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2N,S2M	4 Secure	304	9.4 ± 0.0	NB
A	<i>Somateria spectabilis</i>	King Eider				S2N,S2M	4 Secure	55	18.2 ± 9.0	NB
A	<i>Larus hyperboreus</i>	Glaucous Gull				S2N,S2M	4 Secure	155	1.3 ± 0.0	NB
A	<i>Asio otus</i>	Long-eared Owl				S2S3	5 Undetermined	19	5.9 ± 7.0	NB
A	<i>Picoides dorsalis</i>	American Three-toed Woodpecker				S2S3	3 Sensitive	10	21.7 ± 7.0	NB
A	<i>Salmo salar</i>	Atlantic Salmon				S2S3	2 May Be At Risk	38	0.9 ± 1.0	NB
A	<i>Anas clypeata</i>	Northern Shoveler				S2S3B,S2S3M	4 Secure	75	1.0 ± 4.0	NB
A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S2S3B,S2S3M	3 Sensitive	189	6.9 ± 7.0	NB
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B,S2S3M	3 Sensitive	393	1.7 ± 0.0	NB
A	<i>Pluvialis dominica</i>	American Golden-Plover				S2S3M	3 Sensitive	263	19.5 ± 0.0	NB
A	<i>Calcarius lapponicus</i>	Lapland Longspur				S2S3N,SUM	3 Sensitive	36	46.4 ± 0.0	NB
A	<i>Cephus grylle</i>	Black Guillemot				S3	4 Secure	774	8.3 ± 7.0	NB
A	<i>Loxia curvirostra</i>	Red Crossbill				S3	4 Secure	90	4.0 ± 0.0	NB
A	<i>Carduelis pinus</i>	Pine Siskin				S3	4 Secure	181	0.8 ± 0.0	NB
A	<i>Prosopium cylindraceum</i>	Round Whitefish				S3	4 Secure	3	64.1 ± 10.0	NB
A	<i>Salvelinus namaycush</i>	Lake Trout				S3	3 Sensitive	6	20.9 ± 0.0	NB
A	<i>Sorex maritimensis</i>	Maritime Shrew				S3	4 Secure	1	91.1 ± 1.0	NB
A	<i>Eptesicus fuscus</i>	Big Brown Bat				S3	3 Sensitive	47	10.4 ± 1.0	NB
A	<i>Cathartes aura</i>	Turkey Vulture				S3B,S3M	4 Secure	246	1.3 ± 6.0	NB
A	<i>Rallus limicola</i>	Virginia Rail				S3B,S3M	3 Sensitive	112	0.6 ± 0.0	NB
A	<i>Charadrius vociferus</i>	Killdeer				S3B,S3M	3 Sensitive	681	0.7 ± 0.0	NB
A	<i>Tringa semipalmata</i>	Willet				S3B,S3M	3 Sensitive	150	19.3 ± 2.0	NB
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B,S3M	4 Secure	151	5.9 ± 7.0	NB
A	<i>Vireo gilvus</i>	Warbling Vireo				S3B,S3M	4 Secure	200	0.6 ± 0.0	NB
A	<i>Piranga olivacea</i>	Scarlet Tanager				S3B,S3M	4 Secure	172	5.9 ± 7.0	NB
A	<i>Passerina cyanea</i>	Indigo Bunting				S3B,S3M	4 Secure	93	5.2 ± 7.0	NB
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S3B,S3M	2 May Be At Risk	210	6.9 ± 7.0	NB
A	<i>Icterus galbula</i>	Baltimore Oriole				S3B,S3M	4 Secure	153	5.9 ± 7.0	NB
A	<i>Somateria mollissima</i>	Common Eider				S3B,S4M,S3N	4 Secure	1912	4.2 ± 16.0	NB
A	<i>Dendroica tigrina</i>	Cape May Warbler				S3B,S4S5M	4 Secure	102	6.9 ± 7.0	NB
A	<i>Anas acuta</i>	Northern Pintail				S3B,S5M	3 Sensitive	45	37.2 ± 2.0	NB
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3B,S5M,S4S5N	4 Secure	367	6.9 ± 7.0	NB
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	4 Secure	701	18.7 ± 0.0	NB
A	<i>Phalaropus fulicarius</i>	Red Phalarope				S3M	3 Sensitive	126	9.0 ± 0.0	NB
A	<i>Melanitta nigra</i>	Black Scoter				S3M,S1S2N	3 Sensitive	783	4.2 ± 16.0	NB
A	<i>Bucephala albeola</i>	Bufflehead				S3M,S2N	3 Sensitive	1110	1.2 ± 0.0	NB
A	<i>Calidris maritima</i>	Purple Sandpiper				S3M,S3N	4 Secure	262	10.4 ± 10.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Uria lomvia</i>	Thick-billed Murre				S3N,S3M	5 Undetermined	67	9.9 ± 0.0	NB
A	<i>Synaptomys cooperi</i>	Southern Bog Lemming				S3S4	4 Secure	18	62.0 ± 1.0	NB
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3S4B,S3S4M	3 Sensitive	384	0.8 ± 0.0	NB
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B,S5M	4 Secure	823	1.0 ± 4.0	NB
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3S4B,S5M	4 Secure	542	1.0 ± 1.0	NB
A	<i>Larus delawarensis</i>	Ring-billed Gull				S3S4B,S5M	4 Secure	219	11.0 ± 1.0	NB
A	<i>Dendroica striata</i>	Blackpoll Warbler				S3S4B,S5M	4 Secure	76	6.9 ± 7.0	NB
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3S4M	4 Secure	823	10.5 ± 0.0	NB
A	<i>Limosa haemastica</i>	Hudsonian Godwit				S3S4M	4 Secure	92	33.6 ± 1.0	NB
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3S4M	4 Secure	2013	8.8 ± 0.0	NB
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S3S4M	4 Secure	308	26.4 ± 2.0	NB
A	<i>Calidris alba</i>	Sanderling				S3S4M,S1N	3 Sensitive	809	19.3 ± 3.0	NB
A	<i>Morus bassanus</i>	Northern Gannet				SHB,S5M	4 Secure	836	11.0 ± 1.0	NB
A	<i>Lanius ludovicianus</i>	Loggerhead Shrike				SXB,SXM	1 At Risk	1	54.5 ± 1.0	NB
C	<i>Quercus macrocarpa</i> - <i>Acer rubrum</i> / <i>Onoclea sensibilis</i> - <i>Carex arcta</i> Forest	Bur Oak - Red Maple / Sensitive Fern - Northern Clustered Sedge Forest				S2		1	96.4 ± 0.0	
C	<i>Acer saccharinum</i> / <i>Onoclea sensibilis</i> - <i>Lysimachia terrestris</i> Forest	Silver Maple / Sensitive Fern - Swamp Yellow Loosestrife Forest				S3		1	62.5 ± 0.0	NB
C	<i>Acer saccharum</i> - <i>Fraxinus americana</i> / <i>Polystichum</i> <i>acrostichoides</i> Forest	Sugar Maple - White Ash / Christmas Fern Forest				S3S4		1	82.2 ± 0.0	NB
I	<i>Gomphus ventricosus</i>	Skillet Clubtail	Endangered		Endangered	S1S2	2 May Be At Risk	48	86.4 ± 0.0	NB
I	<i>Danaus plexippus</i>	Monarch	Endangered	Special Concern	Special Concern	S3B,S3M	3 Sensitive	100	6.9 ± 5.0	NB
I	<i>Ophiogomphus howei</i>	Pygmy Snaketail	Special Concern	Special Concern	Special Concern	S2	2 May Be At Risk	3	10.1 ± 0.0	NB
I	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern		Special Concern	S2	3 Sensitive	1	62.8 ± 0.0	NB
I	<i>Lampsilis cariosa</i>	Yellow Lampmussel	Special Concern	Special Concern	Special Concern	S2	3 Sensitive	79	62.5 ± 0.0	NB
I	<i>Bombus terricola</i>	Yellow-banded Bumblebee	Special Concern			S3?	3 Sensitive	8	83.3 ± 0.0	NB
I	<i>Appalachina sayana</i>	Spike-lip Crater	Not At Risk			S3?		1	67.1 ± 1.0	NB
I	<i>Haematopota rara</i>	Shy Cleg				S1	5 Undetermined	1	89.1 ± 1.0	NB
I	<i>Lycaena dorcas</i>	Dorcas Copper				S1	2 May Be At Risk	1	39.1 ± 0.0	NB
I	<i>Erora laeta</i>	Early Hairstreak				S1	2 May Be At Risk	4	66.3 ± 7.0	NB
I	<i>Somatochlora septentrionalis</i>	Muskeg Emerald				S1	2 May Be At Risk	1	86.9 ± 1.0	NB
I	<i>Arigomphus furcifer</i>	Lilypad Clubtail				S1	5 Undetermined	6	90.1 ± 0.0	NB
I	<i>Polites origenes</i>	Crossline Skipper				S1?	5 Undetermined	5	84.9 ± 0.0	NB
I	<i>Plebejus saepiolus</i>	Greenish Blue				S1S2	4 Secure	3	14.2 ± 0.0	NB
I	<i>Ophiogomphus colubrinus</i>	Boreal Snaketail				S1S2	2 May Be At Risk	36	28.2 ± 1.0	NB
I	<i>Brachyleptura circumdata</i>	a Longhorned Beetle				S2		6	90.0 ± 0.0	NB
I	<i>Satyrrium calanus</i>	Banded Hairstreak				S2	3 Sensitive	13	89.0 ± 0.0	NB
I	<i>Satyrrium calanus falacer</i>	Banded Hairstreak				S2	4 Secure	4	91.3 ± 1.0	NB
I	<i>Strymon melinus</i>	Grey Hairstreak				S2	4 Secure	3	39.0 ± 1.0	NB
I	<i>Aeshna clepsydra</i>	Mottled Darner				S2	3 Sensitive	8	51.2 ± 1.0	NB
I	<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S2	5 Undetermined	4	43.6 ± 1.0	NB
I	<i>Ladona exusta</i>	White Corporal				S2	5 Undetermined	8	17.1 ± 0.0	NB
I	<i>Hetaerina americana</i>	American Rubyspot				S2	3 Sensitive	2	62.8 ± 0.0	NB
I	<i>Ischnura posita</i>	Fragile Forktail				S2	2 May Be At Risk	8	2.5 ± 0.0	NB
I	<i>Callophrys henrici</i>	Henry's Elfin				S2S3	4 Secure	14	76.6 ± 0.0	NB
I	<i>Cellithemis martha</i>	Martha's Pennant				S2S3	5 Undetermined	1	48.3 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
	<i>Sphaeroderus nitidicollis</i>	a Ground Beetle				S3	4 Secure	1	94.5 ± 0.0	NB
	<i>Lepturoopsis biforis</i>	a Longhorned Beetle				S3		1	63.2 ± 1.0	NB
	<i>Orthosoma brunneum</i>	a Longhorned Beetle				S3		1	99.7 ± 5.0	NB
	<i>Elaphrus americanus</i>	a Ground Beetle				S3	4 Secure	1	90.1 ± 0.0	NB
	<i>Desmocerus palliatus</i>	Elderberry Borer				S3		4	63.2 ± 1.0	NB
	<i>Agonum excavatum</i>	a Ground Beetle				S3	4 Secure	1	90.1 ± 0.0	NB
	<i>Clivina americana</i>	a Ground Beetle				S3	4 Secure	1	90.1 ± 0.0	NB
	<i>Olisthopus parmatus</i>	a Ground Beetle				S3	4 Secure	1	94.5 ± 0.0	NB
	<i>Paratachys scitulus</i>	a Ground Beetle				S3	5 Undetermined	1	90.1 ± 0.0	NB
	<i>Coccinella hieroglyphica kirbyi</i>	a Ladybird Beetle				S3	4 Secure	1	63.2 ± 1.0	NB
	<i>Hippodamia parenthesis</i>	Parenthesis Lady Beetle				S3	4 Secure	2	63.2 ± 1.0	NB
	<i>Stenocorus vittigera</i>	a Longhorned Beetle				S3		1	90.1 ± 0.0	NB
	<i>Gnathacmaeops pratensis</i>	a Longhorned Beetle				S3		5	63.2 ± 1.0	NB
	<i>Pogonocherus mixtus</i>	a Longhorned Beetle				S3		1	63.2 ± 1.0	NB
	<i>Badister neopulchellus</i>	a Ground Beetle				S3	4 Secure	1	90.1 ± 0.0	NB
	<i>Saperda lateralis</i>	a Longhorned Beetle				S3		2	50.1 ± 0.0	NB
	<i>Hesperia sassacus</i>	Indian Skipper				S3	4 Secure	9	43.5 ± 7.0	NB
	<i>Euphyes bimacula</i>	Two-spotted Skipper				S3	4 Secure	10	5.0 ± 1.0	NB
	<i>Lycaena hyllus</i>	Bronze Copper				S3	3 Sensitive	4	39.4 ± 1.0	NB
	<i>Satyrium acadica</i>	Acadian Hairstreak				S3	4 Secure	9	41.4 ± 1.0	NB
	<i>Callophrys polios</i>	Hoary Elfin				S3	4 Secure	10	48.3 ± 7.0	NB
	<i>Plebejus idas</i>	Northern Blue				S3	4 Secure	8	15.1 ± 7.0	NB
	<i>Plebejus idas empetri</i>	Crowberry Blue				S3	4 Secure	6	22.5 ± 1.0	NB
	<i>Speyeria aphrodite</i>	Aphrodite Fritillary				S3	4 Secure	26	9.3 ± 0.0	NB
	<i>Boloria bellona</i>	Meadow Fritillary				S3	4 Secure	41	14.3 ± 1.0	NB
	<i>Polygonia satyrus</i>	Satyr Comma				S3	4 Secure	12	50.4 ± 1.0	NB
	<i>Polygonia gracilis</i>	Hoary Comma				S3	4 Secure	4	54.2 ± 7.0	NB
	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S3	4 Secure	20	52.8 ± 1.0	NB
	<i>Gomphus vastus</i>	Cobra Clubtail				S3	3 Sensitive	54	80.1 ± 0.0	NB
	<i>Gomphus abbreviatus</i>	Spine-crowned Clubtail				S3	4 Secure	25	49.5 ± 1.0	NB
	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	5 Undetermined	10	41.4 ± 1.0	NB
	<i>Dorocordulia lepida</i>	Petite Emerald				S3	4 Secure	22	38.7 ± 0.0	NB
	<i>Somatochlora cingulata</i>	Lake Emerald				S3	4 Secure	11	16.5 ± 1.0	NB
	<i>Somatochlora forcipata</i>	Forcipate Emerald				S3	4 Secure	18	17.9 ± 1.0	NB
	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S3	4 Secure	13	41.4 ± 1.0	NB
	<i>Lestes eurinus</i>	Amber-Winged Spreadwing				S3	4 Secure	8	46.5 ± 1.0	NB
	<i>Lestes vigilax</i>	Swamp Spreadwing				S3	3 Sensitive	32	2.5 ± 0.0	NB
	<i>Enallagma geminatum</i>	Skimming Bluet				S3	5 Undetermined	8	39.7 ± 1.0	NB
	<i>Enallagma signatum</i>	Orange Bluet				S3	4 Secure	8	39.7 ± 1.0	NB
	<i>Stylurus scudderi</i>	Zebra Clubtail				S3	4 Secure	66	18.0 ± 1.0	NB
	<i>Alasmidonta undulata</i>	Triangle Floater				S3	3 Sensitive	18	24.2 ± 1.0	NB
	<i>Leptodea ochracea</i>	Tidewater Mucket				S3	4 Secure	55	54.8 ± 1.0	NB
	<i>Striatura ferrea</i>	Black Striate				S3		1	89.2 ± 1.0	NB
	<i>Neohelix albolabris</i>	Whitelip				S3		1	89.2 ± 1.0	NB
	<i>Spurwinkia salsa</i>	Saltmarsh Hydrobe				S3		34	36.3 ± 0.0	NB
	<i>Pantala hymenaea</i>	Spot-Winged Glider				S3B,S3M	4 Secure	5	17.9 ± 1.0	NB
	<i>Satyrium liparops</i>	Striped Hairstreak				S3S4	4 Secure	6	38.8 ± 7.0	NB
	<i>Satyrium liparops strigosum</i>	Striped Hairstreak				S3S4	4 Secure	1	95.6 ± 10.0	NB
	<i>Cupido comyntas</i>	Eastern Tailed Blue				S3S4	4 Secure	9	42.2 ± 0.0	NB
	<i>Coccinella</i>	Transverse Lady Beetle				SH	2 May Be At Risk	2	53.2 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
	<i>transversoguttata</i>									
	<i>richardsoni</i>									
N	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	SH	1 At Risk	1	28.7 ± 1.0	NB
N	<i>Degelia plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Special Concern	S1	2 May Be At Risk	2	28.2 ± 5.0	NB
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	5 Undetermined	17	12.0 ± 0.0	NB
N	<i>Bryum muehlenbeckii</i>	Muehlenbeck's Bryum Moss				S1	2 May Be At Risk	1	56.1 ± 1.0	NB
N	<i>Sphagnum macrophyllum</i>	Sphagnum				S1	2 May Be At Risk	2	42.8 ± 0.0	NB
N	<i>Coscinodon cribrosus</i>	Sieve-Toothed Moss				S1	2 May Be At Risk	1	60.1 ± 0.0	NB
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S1	2 May Be At Risk	1	48.6 ± 10.0	NB
N	<i>Calliergon trifarium</i>	Three-ranked Moss				S1?	2 May Be At Risk	1	50.3 ± 0.0	NB
N	<i>Dichelyma falcatum</i>	a Moss				S1?	2 May Be At Risk	2	52.8 ± 1.0	NB
N	<i>Dicranum bonjeanii</i>	Bonjean's Broom Moss				S1?	2 May Be At Risk	1	91.2 ± 1.0	NB
N	<i>Eurhynchium hians</i>	Light Beaked Moss				S1?	2 May Be At Risk	1	93.1 ± 1.0	NB
N	<i>Plagiothecium latebricola</i>	Alder Silk Moss				S1?	2 May Be At Risk	1	56.7 ± 0.0	NB
N	<i>Racomitrium ericoides</i>	a Moss				S1?	2 May Be At Risk	1	60.9 ± 3.0	NB
N	<i>Splachnum pennsylvanicum</i>	Southern Dung Moss				S1?	2 May Be At Risk	1	86.1 ± 0.0	NB
N	<i>Platylomella lescurii</i>	a Moss				S1?	5 Undetermined	1	25.9 ± 1.0	NB
N	<i>Jungermannia obovata</i>	Egg Flapwort				S1S2	6 Not Assessed	1	69.6 ± 0.0	NB
N	<i>Pallavicinia lyellii</i>	Lyell's Ribbonwort				S1S2	6 Not Assessed	1	73.3 ± 1.0	NB
N	<i>Reboulia hemisphaerica</i>	Purple-margined Liverwort				S1S2	6 Not Assessed	1	24.3 ± 1.0	NB
N	<i>Brachythecium acuminatum</i>	Acuminate Ragged Moss				S1S2	5 Undetermined	2	93.1 ± 10.0	NB
N	<i>Bryum salinum</i>	a Moss				S1S2	2 May Be At Risk	1	24.1 ± 1.0	NB
N	<i>Campylium radicale</i>	Long-stalked Fine Wet Moss				S1S2	5 Undetermined	1	93.1 ± 1.0	NB
N	<i>Ditrichum pallidum</i>	Pale Cow-hair Moss				S1S2	2 May Be At Risk	1	80.8 ± 1.0	NB
N	<i>Sphagnum platyphyllum</i>	Flat-leaved Peat Moss				S1S2	5 Undetermined	2	52.6 ± 0.0	NB
N	<i>Tomentypnum falcifolium</i>	Sickle-leaved Golden Moss				S1S2	2 May Be At Risk	1	33.5 ± 1.0	NB
N	<i>Pseudotaxiphyllum distichaceum</i>	a Moss				S1S2	2 May Be At Risk	2	24.1 ± 1.0	NB
N	<i>Hamatocaulis vernicosus</i>	a Moss				S1S2	2 May Be At Risk	1	85.6 ± 100.0	NB
N	<i>Calypogeia neesiana</i>	Nees' Pouchwort				S1S3	6 Not Assessed	1	81.6 ± 1.0	NB
N	<i>Cephaloziella elachista</i>	Spurred Threadwort				S1S3	6 Not Assessed	1	50.3 ± 5.0	NB
N	<i>Porella pinnata</i>	Pinnate Scalewort				S1S3	6 Not Assessed	2	54.0 ± 1.0	NB
N	<i>Amphidium mougeotii</i>	a Moss				S2	3 Sensitive	2	25.2 ± 8.0	NB
N	<i>Anomodon viticulosus</i>	a Moss				S2	2 May Be At Risk	4	59.6 ± 1.0	NB
N	<i>Cynodontium strumiferum</i>	Strumose Dogtooth Moss				S2	3 Sensitive	1	25.2 ± 8.0	NB
N	<i>Dicranella palustris</i>	Drooping-Leaved Fork Moss				S2	3 Sensitive	1	99.8 ± 100.0	NB
N	<i>Didymodon ferrugineus</i>	a moss				S2	3 Sensitive	1	80.9 ± 1.0	NB
N	<i>Anomodon tristis</i>	a Moss				S2	2 May Be At Risk	1	57.0 ± 1.0	NB
N	<i>Hypnum pratense</i>	Meadow Plait Moss				S2	3 Sensitive	1	53.7 ± 0.0	NB
N	<i>Physcomitrium immersum</i>	a Moss				S2	3 Sensitive	6	86.1 ± 1.0	NB
N	<i>Sphagnum centrale</i>	Central Peat Moss				S2	3 Sensitive	2	51.1 ± 0.0	NB
N	<i>Sphagnum lindbergii</i>	Lindberg's Peat Moss				S2	3 Sensitive	7	24.1 ± 1.0	NB
N	<i>Tayloria serrata</i>	Serrate Trumpet Moss				S2	3 Sensitive	1	92.8 ± 1.0	NB
N	<i>Tetraplodon mnioides</i>	Entire-leaved Nitrogen Moss				S2	3 Sensitive	3	24.1 ± 1.0	NB
N	<i>Tortula mucronifolia</i>	Mucronate Screw Moss				S2	3 Sensitive	1	59.7 ± 0.0	NB



Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
N	<i>Ulota phyllantha</i>	a Moss				S2	3 Sensitive	2	24.1 ± 1.0	NB
N	<i>Anomobryum filiforme</i>	a moss				S2	5 Undetermined	1	93.1 ± 1.0	NB
N	<i>Nephroma laevigatum</i>	Mustard Kidney Lichen				S2	2 May Be At Risk	1	48.6 ± 10.0	NB
N	<i>Andreaea rothii</i>	a Moss				S2?	3 Sensitive	1	80.6 ± 0.0	NB
N	<i>Brachythecium digastrum</i>	a Moss				S2?	3 Sensitive	2	89.8 ± 0.0	NB
N	<i>Bryum pallescens</i>	Pale Bryum Moss				S2?	5 Undetermined	2	43.7 ± 1.0	NB
N	<i>Dichelyma capillaceum</i>	Hairlike Dichelyma Moss				S2?	3 Sensitive	1	77.8 ± 4.0	NB
N	<i>Dicranum spurium</i>	Spurred Broom Moss				S2?	3 Sensitive	2	16.7 ± 0.0	NB
N	<i>Schistostega pennata</i>	Luminous Moss				S2?	3 Sensitive	2	93.1 ± 1.0	NB
N	<i>Seligeria campylopoda</i>	a Moss				S2?	3 Sensitive	1	85.6 ± 100.0	NB
N	<i>Seligeria diversifolia</i>	a Moss				S2?	3 Sensitive	1	99.4 ± 0.0	NB
N	<i>Sphagnum angermanicum</i>	a Peatmoss				S2?	3 Sensitive	2	31.7 ± 1.0	NB
N	<i>Bryum uliginosum</i>	a Moss				S2S3	3 Sensitive	1	83.1 ± 4.0	NB
N	<i>Buxbaumia aphylla</i>	Brown Shield Moss				S2S3	3 Sensitive	2	25.2 ± 8.0	NB
N	<i>Calliergonella cuspidata</i>	Common Large Wetland Moss				S2S3	3 Sensitive	5	19.0 ± 10.0	NB
N	<i>Campylium polygamum</i>	a Moss				S2S3	3 Sensitive	1	70.5 ± 1.0	NB
N	<i>Didymodon rigidulus</i>	Rigid Screw Moss				S2S3	3 Sensitive	1	76.6 ± 8.0	NB
N	<i>Orthotrichum speciosum</i>	Showy Bristle Moss				S2S3	5 Undetermined	3	13.4 ± 2.0	NB
N	<i>Racomitrium fasciculare</i>	a Moss				S2S3	3 Sensitive	1	17.6 ± 0.0	NB
N	<i>Scorpidium scorpioides</i>	Hooked Scorpion Moss				S2S3	3 Sensitive	4	50.3 ± 0.0	NB
N	<i>Sphagnum subfulvum</i>	a Peatmoss				S2S3	2 May Be At Risk	4	33.5 ± 1.0	NB
N	<i>Taxiphyllum deplanatum</i>	Imbricate Yew-leaved Moss				S2S3	3 Sensitive	1	24.1 ± 1.0	NB
N	<i>Zygodon viridissimus</i>	a Moss				S2S3	2 May Be At Risk	3	19.2 ± 3.0	NB
N	<i>Schistidium agassizii</i>	Elf Bloom Moss				S2S3	3 Sensitive	2	13.4 ± 2.0	NB
N	<i>Loeskeobryum brevirostre</i>	a Moss				S2S3	3 Sensitive	3	91.7 ± 3.0	NS
N	<i>Cynodontium tenellum</i>	Delicate Dogtooth Moss				S3	3 Sensitive	1	24.1 ± 1.0	NB
N	<i>Hypnum curvifolium</i>	Curved-leaved Plait Moss				S3	3 Sensitive	1	22.3 ± 5.0	NB
N	<i>Schistidium maritimum</i>	a Moss				S3	4 Secure	2	24.1 ± 1.0	NB
N	<i>Aulacomnium androgynum</i>	Little Groove Moss				S3?	4 Secure	3	22.3 ± 5.0	NB
N	<i>Dicranella rufescens</i>	Red Forklet Moss				S3?	5 Undetermined	2	84.3 ± 4.0	NB
N	<i>Rhytidiadelphus loreus</i>	Lanky Moss				S3?	2 May Be At Risk	1	62.0 ± 10.0	NB
N	<i>Sphagnum lescurii</i>	a Peatmoss				S3?	5 Undetermined	2	50.5 ± 1.0	NB
N	<i>Barbula convoluta</i>	Lesser Bird's-claw Beard Moss				S3S4	4 Secure	1	76.6 ± 8.0	NB
N	<i>Brachythecium velutinum</i>	Velvet Ragged Moss				S3S4	4 Secure	3	20.3 ± 0.0	NB
N	<i>Dicranella cerviculata</i>	a Moss				S3S4	3 Sensitive	3	18.4 ± 6.0	NB
N	<i>Dicranum majus</i>	Greater Broom Moss				S3S4	4 Secure	6	24.1 ± 1.0	NB
N	<i>Fissidens bryoides</i>	Lesser Pocket Moss				S3S4	4 Secure	2	79.3 ± 4.0	NB
N	<i>Heterocladium dimorphum</i>	Dimorphous Tangle Moss				S3S4	4 Secure	1	13.4 ± 2.0	NB
N	<i>Isopterygiopsis muelleriana</i>	a Moss				S3S4	4 Secure	6	20.3 ± 0.0	NB
N	<i>Myurella julacea</i>	Small Mouse-tail Moss				S3S4	4 Secure	1	25.2 ± 8.0	NB
N	<i>Physcomitrium pyriforme</i>	Pear-shaped Urn Moss				S3S4	3 Sensitive	3	88.1 ± 0.0	NB
N	<i>Pogonatum dentatum</i>	Mountain Hair Moss				S3S4	4 Secure	1	24.1 ± 1.0	NB
N	<i>Sphagnum torreyanum</i>	a Peatmoss				S3S4	4 Secure	4	47.1 ± 0.0	NB
N	<i>Sphagnum austinii</i>	Austin's Peat Moss				S3S4	4 Secure	1	47.0 ± 1.0	NB
N	<i>Sphagnum contortum</i>	Twisted Peat Moss				S3S4	4 Secure	1	68.8 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
N	<i>Splachnum rubrum</i>	Red Collar Moss				S3S4	4 Secure	1	86.8 ± 1.0	NB
N	<i>Tetraphis geniculata</i>	Geniculate Four-tooth Moss				S3S4	4 Secure	4	23.7 ± 0.0	NB
N	<i>Tetraplodon angustatus</i>	Toothed-leaved Nitrogen Moss				S3S4	4 Secure	1	24.1 ± 1.0	NB
N	<i>Trichostomum tenuirostre</i>	Acid-Soil Moss				S3S4	4 Secure	2	20.3 ± 0.0	NB
N	<i>Grimmia anodon</i>	Toothless Grimmia Moss				SH	5 Undetermined	2	61.6 ± 10.0	NB
N	<i>Leucodon brachypus</i>	a Moss				SH	2 May Be At Risk	2	18.8 ± 100.0	NB
P	<i>Juglans cinerea</i>	Butternut	Endangered	Endangered	Endangered	S1	1 At Risk	53	65.4 ± 1.0	NB
P	<i>Polemonium vanbruntiae</i>	Van Brunt's Jacob's-ladder	Threatened	Threatened	Threatened	S1	1 At Risk	72	6.3 ± 0.0	NB
P	<i>Symphytotrichum anticostense</i>	Anticosti Aster	Threatened	Threatened	Endangered	S2S3	1 At Risk	4	91.7 ± 0.0	NB
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Endangered	S2	1 At Risk	21	56.8 ± 0.0	NB
P	<i>Pterospora andromedea</i>	Woodland Pinedrops			Endangered	S1	1 At Risk	11	91.6 ± 0.0	NB
P	<i>Sanicula trifoliata</i>	Large-Fruited Sanicle				S1	2 May Be At Risk	1	89.4 ± 5.0	NB
P	<i>Antennaria parlinii</i>	a Pussytoes				S1	2 May Be At Risk	7	37.6 ± 0.0	NB
P	<i>Antennaria howellii</i> ssp. <i>petaloidea</i>	Pussy-Toes				S1	2 May Be At Risk	4	53.7 ± 1.0	NB
P	<i>Bidens discoidea</i>	Swamp Beggarticks				S1	2 May Be At Risk	3	93.9 ± 0.0	NB
P	<i>Helianthus decapetalus</i>	Ten-rayed Sunflower				S1	2 May Be At Risk	13	91.8 ± 1.0	NB
P	<i>Hieracium kalmii</i>	Kalm's Hawkweed				S1	2 May Be At Risk	5	23.1 ± 1.0	NB
P	<i>Hieracium kalmii</i> var. <i>kalmii</i>	Kalm's Hawkweed				S1	2 May Be At Risk	7	22.4 ± 1.0	NB
P	<i>Hieracium paniculatum</i>	Panicled Hawkweed				S1	2 May Be At Risk	5	72.4 ± 1.0	NB
P	<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S1	2 May Be At Risk	14	53.0 ± 0.0	NB
P	<i>Cardamine parviflora</i> var. <i>arenicola</i>	Small-flowered Bittercress				S1	2 May Be At Risk	12	16.9 ± 1.0	NB
P	<i>Cardamine concatenata</i>	Cut-leaved Toothwort				S1	2 May Be At Risk	1	83.2 ± 1.0	NB
P	<i>Draba arabisans</i>	Rock Whitlow-Grass				S1	2 May Be At Risk	7	31.4 ± 0.0	NB
P	<i>Draba breweri</i> var. <i>cana</i>	Brewer's Whitlow-grass				S1	2 May Be At Risk	10	98.6 ± 0.0	NB
P	<i>Draba glabella</i>	Rock Whitlow-Grass				S1	2 May Be At Risk	7	51.0 ± 1.0	NB
P	<i>Minuartia groenlandica</i>	Greenland Stitchwort				S1	2 May Be At Risk	4	43.3 ± 0.0	NB
P	<i>Chenopodium capitatum</i>	Strawberry-bite				S1	2 May Be At Risk	3	62.6 ± 1.0	NB
P	<i>Chenopodium simplex</i>	Maple-leaved Goosefoot				S1	2 May Be At Risk	10	57.8 ± 1.0	NB
P	<i>Callitriche terrestris</i>	Terrestrial Water-Starwort				S1	5 Undetermined	1	52.8 ± 0.0	NB
P	<i>Triadenum virginicum</i>	Virginia St John's-wort				S1	2 May Be At Risk	7	59.8 ± 0.0	NB
P	<i>Viburnum acerifolium</i>	Maple-leaved Viburnum				S1	2 May Be At Risk	10	42.5 ± 0.0	NB
P	<i>Corema conradii</i>	Broom Crowberry				S1	2 May Be At Risk	1	60.4 ± 10.0	NB
P	<i>Vaccinium boreale</i>	Northern Blueberry				S1	2 May Be At Risk	1	24.8 ± 0.0	NB
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S1	3 Sensitive	9	34.6 ± 5.0	NB
P	<i>Chamaesyce polygonifolia</i>	Seaside Spurge				S1	2 May Be At Risk	8	49.7 ± 0.0	NB
P	<i>Desmodium glutinosum</i>	Large Tick-Trefoil				S1	2 May Be At Risk	1	45.4 ± 1.0	NB
P	<i>Gentiana rubricaulis</i>	Purple-stemmed Gentian				S1	2 May Be At Risk	14	20.9 ± 0.0	NB
P	<i>Lomatogonium rotatum</i>	Marsh Felwort				S1	2 May Be At Risk	2	23.5 ± 0.0	NB
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S1	2 May Be At Risk	2	21.5 ± 0.0	NB
P	<i>Pycnanthemum virginianum</i>	Virginia Mountain Mint				S1	2 May Be At Risk	4	84.5 ± 0.0	NB
P	<i>Decodon verticillatus</i>	Swamp Loosestrife				S1	2 May Be At Risk	1	95.4 ± 0.0	NB

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P	<i>Lysimachia hybrida</i>	Lowland Yellow Loosestrife				S1	2 May Be At Risk	15	38.8 ± 0.0	NB
P	<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife				S1	2 May Be At Risk	16	49.6 ± 1.0	NB
P	<i>Primula laurentiana</i>	Laurentian Primrose				S1	2 May Be At Risk	6	91.5 ± 1.0	NS
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S1	2 May Be At Risk	6	37.0 ± 1.0	NB
P	<i>Crataegus jonesiae</i>	Jones' Hawthorn				S1	2 May Be At Risk	5	18.3 ± 0.0	NB
P	<i>Galium brevipes</i>	Limestone Swamp Bedstraw				S1	2 May Be At Risk	3	43.0 ± 5.0	NB
P	<i>Saxifraga paniculata</i> <i>ssp. neogaea</i>	White Mountain Saxifrage				S1	2 May Be At Risk	7	69.4 ± 10.0	NB
P	<i>Agalinis paupercula</i> <i>var. borealis</i>	Small-flowered Agalinis				S1	2 May Be At Risk	8	79.7 ± 1.0	NB
P	<i>Agalinis tenuifolia</i>	Slender Agalinis				S1	2 May Be At Risk	6	89.3 ± 0.0	NB
P	<i>Gratiola aurea</i>	Golden Hedge-Hyssop				S1	3 Sensitive	2	41.8 ± 5.0	NB
P	<i>Pedicularis canadensis</i>	Canada Lousewort				S1	2 May Be At Risk	20	23.0 ± 0.0	NB
P	<i>Viola sagittata</i> <i>var.</i> <i>ovata</i>	Arrow-Leaved Violet				S1	2 May Be At Risk	19	45.7 ± 0.0	NB
P	<i>Alisma subcordatum</i>	Southern Water Plantain				S1	5 Undetermined	6	58.8 ± 5.0	NB
P	<i>Carex backii</i>	Rocky Mountain Sedge				S1	2 May Be At Risk	5	98.1 ± 1.0	NB
P	<i>Carex cephaloidea</i>	Thin-leaved Sedge				S1	2 May Be At Risk	2	87.9 ± 0.0	NB
P	<i>Carex merritt-feraldii</i>	Merritt Fernald's Sedge				S1	2 May Be At Risk	2	20.4 ± 0.0	NB
P	<i>Carex saxatilis</i>	Russet Sedge				S1	2 May Be At Risk	13	59.3 ± 10.0	NB
P	<i>Carex sterilis</i>	Sterile Sedge				S1	2 May Be At Risk	1	91.6 ± 0.0	NB
P	<i>Carex grisea</i>	Inflated Narrow-leaved Sedge				S1	2 May Be At Risk	9	89.3 ± 0.0	NB
P	<i>Cyperus diandrus</i>	Low Flatsedge				S1	2 May Be At Risk	7	89.1 ± 1.0	NB
P	<i>Cyperus lupulinus</i>	Hop Flatsedge				S1	2 May Be At Risk	3	96.1 ± 0.0	NB
P	<i>Cyperus lupulinus</i> <i>ssp.</i> <i>macilentus</i>	Hop Flatsedge				S1	2 May Be At Risk	12	95.7 ± 0.0	NB
P	<i>Eleocharis olivacea</i>	Yellow Spikerush				S1	2 May Be At Risk	4	40.5 ± 1.0	NB
P	<i>Rhynchospora</i> <i>capillacea</i>	Slender Beakrush				S1	2 May Be At Risk	3	91.7 ± 0.0	NB
P	<i>Sisyrinchium</i> <i>angustifolium</i>	Narrow-leaved Blue-eyed-grass				S1	2 May Be At Risk	1	61.9 ± 1.0	NB
P	<i>Juncus greenei</i>	Greene's Rush				S1	2 May Be At Risk	1	12.6 ± 0.0	NB
P	<i>Juncus subtilis</i>	Creeping Rush				S1	2 May Be At Risk	1	83.0 ± 5.0	NB
P	<i>Allium canadense</i>	Canada Garlic				S1	2 May Be At Risk	11	84.5 ± 0.0	NB
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S1	2 May Be At Risk	1	91.8 ± 0.0	NB
P	<i>Malaxis brachypoda</i>	White Adder's-Mouth				S1	2 May Be At Risk	3	48.6 ± 10.0	NB
P	<i>Platanthera flava</i> <i>var.</i> <i>herbiola</i>	Pale Green Orchid				S1	2 May Be At Risk	12	28.1 ± 0.0	NB
P	<i>Platanthera</i> <i>macrophylla</i>	Large Round-Leaved Orchid				S1	2 May Be At Risk	1	91.3 ± 1.0	NB
P	<i>Spiranthes casei</i>	Case's Ladies'-Tresses				S1	2 May Be At Risk	6	94.0 ± 0.0	NB
P	<i>Bromus pubescens</i>	Hairy Wood Brome Grass				S1	5 Undetermined	6	96.2 ± 0.0	NB
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S1	2 May Be At Risk	22	37.0 ± 0.0	NB
P	<i>Danthonia compressa</i>	Flattened Oat Grass				S1	2 May Be At Risk	1	86.5 ± 0.0	NB
P	<i>Dichanthelium</i> <i>dichotomum</i>	Forked Panic Grass				S1	2 May Be At Risk	19	37.1 ± 0.0	NB
P	<i>Glyceria obtusa</i>	Atlantic Manna Grass				S1	2 May Be At Risk	6	19.0 ± 5.0	NB
P	<i>Sporobolus compositus</i>	Rough Dropseed				S1	2 May Be At Risk	17	90.6 ± 0.0	NB
P	<i>Potamogeton friesii</i>	Fries' Pondweed				S1	2 May Be At Risk	6	52.7 ± 5.0	NB
P	<i>Potamogeton nodosus</i>	Long-leaved Pondweed				S1	2 May Be At Risk	4	88.1 ± 1.0	NB
P	<i>Potamogeton</i> <i>strictifolius</i>	Straight-leaved Pondweed				S1	2 May Be At Risk	2	75.0 ± 0.0	NB
P	<i>Xyris difformis</i>	Bog Yellow-eyed-grass				S1	5 Undetermined	3	59.8 ± 0.0	NB
P	<i>Asplenium ruta-muraria</i> <i>var. cryptolepis</i>	Wallrue Spleenwort				S1	2 May Be At Risk	3	68.9 ± 0.0	NB
P	<i>Botrychium oneidense</i>	Blunt-lobed Moonwort				S1	2 May Be At Risk	4	61.6 ± 0.0	NB
P	<i>Botrychium rugulosum</i>	Rugulose Moonwort				S1	2 May Be At Risk	1	42.7 ± 1.0	NB

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P	<i>Schizaea pusilla</i>	Little Curlygrass Fern				S1	2 May Be At Risk	18	35.8 ± 0.0	NB
P	<i>Hieracium kalmii</i> var. <i>fasciculatum</i>	Kalm's Hawkweed				S1?	5 Undetermined	6	18.3 ± 0.0	NB
P	<i>Drosera rotundifolia</i> var. <i>comosa</i>	Round-leaved Sundew				S1?	5 Undetermined	5	20.7 ± 1.0	NB
P	<i>Wolffia columbiana</i>	Columbian Watermeal				S1?	2 May Be At Risk	5	85.7 ± 0.0	NB
P	<i>Rumex aquaticus</i> var. <i>fenestratus</i>	Western Dock				S1S2	2 May Be At Risk	1	83.5 ± 1.0	NB
P	<i>Saxifraga virginensis</i>	Early Saxifrage				S1S2	2 May Be At Risk	14	87.1 ± 0.0	NB
P	<i>Potamogeton bicupulatus</i>	Snailseed Pondweed				S1S2	2 May Be At Risk	5	24.9 ± 0.0	NB
P	<i>Selaginella rupestris</i>	Rock Spikemoss				S1S2	2 May Be At Risk	20	90.4 ± 0.0	NS
P	<i>Thelypteris simulata</i>	Bog Fern				S1S2	2 May Be At Risk	1	95.3 ± 0.0	NB
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S1S3	2 May Be At Risk	2	59.6 ± 1.0	NB
P	<i>Listera australis</i>	Southern Twayblade			Endangered	S2	1 At Risk	11	69.9 ± 0.0	NB
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2	3 Sensitive	3	21.2 ± 0.0	NB
P	<i>Sanicula odorata</i>	Clustered Sanicle				S2	2 May Be At Risk	1	96.3 ± 0.0	NB
P	<i>Pseudognaphalium macounii</i>	Macoun's Cudweed				S2	3 Sensitive	9	51.1 ± 0.0	NB
P	<i>Solidago simplex</i> var. <i>racemosa</i>	Sticky Goldenrod				S2	2 May Be At Risk	13	90.1 ± 1.0	NB
P	<i>Ionactis linariifolius</i>	Stiff Aster				S2	3 Sensitive	1	95.5 ± 0.0	NB
P	<i>Symphotrichum racemosum</i>	Small White Aster				S2	3 Sensitive	7	70.6 ± 1.0	NB
P	<i>Alnus serrulata</i>	Smooth Alder				S2	3 Sensitive	36	40.2 ± 0.0	NB
P	<i>Arabis drummondii</i>	Drummond's Rockcress				S2	3 Sensitive	9	59.6 ± 1.0	NB
P	<i>Sagina nodosa</i>	Knotted Pearlwort				S2	3 Sensitive	12	10.9 ± 0.0	NB
P	<i>Sagina nodosa</i> ssp. <i>borealis</i>	Knotted Pearlwort				S2	3 Sensitive	2	45.1 ± 0.0	NB
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S2	3 Sensitive	4	60.0 ± 10.0	NB
P	<i>Atriplex franktonii</i>	Frankton's Saltbush				S2	4 Secure	1	16.9 ± 1.0	NB
P	<i>Chenopodium rubrum</i>	Red Pigweed				S2	3 Sensitive	4	57.0 ± 0.0	NB
P	<i>Hypericum dissimulatum</i>	Disguised St John's-wort				S2	3 Sensitive	6	7.1 ± 1.0	NB
P	<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed				S2	3 Sensitive	8	88.3 ± 1.0	NB
P	<i>Viburnum lentago</i>	Nannyberry				S2	4 Secure	89	37.3 ± 0.0	NB
P	<i>Viburnum recognitum</i>	Northern Arrow-Wood				S2	4 Secure	168	0.6 ± 0.0	NB
P	<i>Astragalus eucosmus</i>	Elegant Milk-vetch				S2	2 May Be At Risk	10	80.6 ± 0.0	NB
P	<i>Oxytropis campestris</i> var. <i>johannensis</i>	Field Locoweed				S2	3 Sensitive	8	68.5 ± 50.0	NB
P	<i>Quercus macrocarpa</i>	Bur Oak				S2	2 May Be At Risk	33	20.0 ± 1.0	NB
P	<i>Gentiana linearis</i>	Narrow-Leaved Gentian				S2	3 Sensitive	5	93.0 ± 5.0	NB
P	<i>Myriophyllum humile</i>	Low Water Milfoil				S2	3 Sensitive	10	66.4 ± 0.0	NB
P	<i>Proserpinaca palustris</i> var. <i>crebra</i>	Marsh Mermaidweed				S2	3 Sensitive	24	6.4 ± 0.0	NB
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2	4 Secure	57	19.5 ± 5.0	NB
P	<i>Nuphar lutea</i> ssp. <i>rubrodisca</i>	Red-disked Yellow Pond-lily				S2	3 Sensitive	9	30.5 ± 0.0	NB
P	<i>Orobanche uniflora</i>	One-Flowered Broomrape				S2	3 Sensitive	13	33.5 ± 0.0	NB
P	<i>Polygala paucifolia</i>	Fringed Milkwort				S2	3 Sensitive	11	5.0 ± 1.0	NB
P	<i>Polygala senega</i>	Seneca Snakeroot				S2	3 Sensitive	2	88.4 ± 1.0	NB
P	<i>Polygonum amphibium</i> var. <i>emersum</i>	Water Smartweed				S2	3 Sensitive	20	1.4 ± 0.0	NB
P	<i>Polygonum careyi</i>	Carey's Smartweed				S2	3 Sensitive	8	20.3 ± 1.0	NB
P	<i>Podostemum ceratophyllum</i>	Horn-leaved Riverweed				S2	3 Sensitive	26	38.9 ± 0.0	NB
P	<i>Anemone multifida</i>	Cut-leaved Anemone				S2	3 Sensitive	1	91.1 ± 0.0	NB

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P	<i>Hepatica nobilis</i> var. <i>obtusata</i>	Round-lobed Hepatica				S2	3 Sensitive	30	37.0 ± 0.0	NB
P	<i>Ranunculus flabellaris</i>	Yellow Water Buttercup				S2	4 Secure	20	44.3 ± 0.0	NB
P	<i>Ranunculus longirostris</i>	Eastern White Water-Crowfoot				S2	5 Undetermined	4	13.8 ± 1.0	NB
P	<i>Crataegus scabrada</i>	Rough Hawthorn				S2	3 Sensitive	3	68.6 ± 0.0	NB
P	<i>Crataegus succulenta</i>	Fleshy Hawthorn				S2	3 Sensitive	1	93.1 ± 5.0	NB
P	<i>Cephalanthus occidentalis</i>	Common Buttonbush				S2	3 Sensitive	65	37.1 ± 0.0	NB
P	<i>Salix candida</i>	Sage Willow				S2	3 Sensitive	2	83.0 ± 1.0	NB
P	<i>Agalinis neoscotica</i>	Nova Scotia Agalinis				S2	3 Sensitive	29	39.5 ± 1.0	NB
P	<i>Euphrasia randii</i>	Rand's Eyebright				S2	2 May Be At Risk	23	16.7 ± 0.0	NB
P	<i>Scrophularia lanceolata</i>	Lance-leaved Figwort				S2	3 Sensitive	3	80.7 ± 100.0	NB
P	<i>Dirca palustris</i>	Eastern Leatherwood				S2	2 May Be At Risk	5	91.6 ± 1.0	NB
P	<i>Phryma leptostachya</i>	American Lopseed				S2	3 Sensitive	2	95.8 ± 1.0	NB
P	<i>Verbena urticifolia</i>	White Vervain				S2	2 May Be At Risk	12	87.8 ± 1.0	NB
P	<i>Viola novae-angliae</i>	New England Violet				S2	3 Sensitive	5	3.7 ± 1.0	NB
P	<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage				S2	3 Sensitive	94	1.3 ± 0.0	NB
P	<i>Carex granularis</i>	Limestone Meadow Sedge				S2	3 Sensitive	7	60.1 ± 0.0	NB
P	<i>Carex gynocrates</i>	Northern Bog Sedge				S2	3 Sensitive	4	46.2 ± 0.0	NB
P	<i>Carex hirtifolia</i>	Pubescent Sedge				S2	3 Sensitive	3	88.1 ± 0.0	NB
P	<i>Carex livida</i> var. <i>radicaulis</i>	Livid Sedge				S2	3 Sensitive	1	60.1 ± 2.0	NB
P	<i>Carex prairea</i>	Prairie Sedge				S2	3 Sensitive	1	91.7 ± 5.0	NS
P	<i>Carex rostrata</i>	Narrow-leaved Beaked Sedge				S2	3 Sensitive	1	42.6 ± 0.0	NB
P	<i>Carex salina</i>	Saltmarsh Sedge				S2	3 Sensitive	2	58.4 ± 1.0	NB
P	<i>Carex sprengelii</i>	Longbeak Sedge				S2	3 Sensitive	1	93.4 ± 0.0	NB
P	<i>Carex tenuiflora</i>	Sparse-Flowered Sedge				S2	2 May Be At Risk	5	40.9 ± 0.0	NB
P	<i>Carex albicans</i> var. <i>emmonsii</i>	White-tinged Sedge				S2	3 Sensitive	1	67.6 ± 0.0	NB
P	<i>Cyperus squarrosus</i>	Awed Flatsedge				S2	3 Sensitive	17	86.4 ± 0.0	NB
P	<i>Eriophorum gracile</i>	Slender Cottongrass				S2	2 May Be At Risk	2	95.0 ± 0.0	NB
P	<i>Blysmus rufus</i>	Red Bulrush				S2	3 Sensitive	3	46.8 ± 0.0	NB
P	<i>Elodea nuttallii</i>	Nuttall's Waterweed				S2	3 Sensitive	9	40.7 ± 0.0	NB
P	<i>Allium tricoccum</i>	Wild Leek				S2	2 May Be At Risk	4	81.9 ± 0.0	NB
P	<i>Najas gracillima</i>	Thread-Like Naiad				S2	3 Sensitive	11	8.3 ± 0.0	NB
P	<i>Calypso bulbosa</i> var. <i>americana</i>	Calypso				S2	2 May Be At Risk	3	65.9 ± 0.0	NB
P	<i>Coeloglossum viride</i> var. <i>virescens</i>	Long-bracted Frog Orchid				S2	2 May Be At Risk	5	78.9 ± 5.0	NB
P	<i>Cypripedium parviflorum</i> var. <i>makasin</i>	Small Yellow Lady's-Slipper				S2	2 May Be At Risk	5	44.1 ± 1.0	NB
P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2	3 Sensitive	11	51.0 ± 1.0	NB
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S2	2 May Be At Risk	9	46.0 ± 5.0	NB
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S2	3 Sensitive	7	37.0 ± 0.0	NB
P	<i>Elymus canadensis</i>	Canada Wild Rye				S2	2 May Be At Risk	14	85.9 ± 1.0	NB
P	<i>Leersia virginica</i>	White Cut Grass				S2	2 May Be At Risk	41	78.8 ± 10.0	NB
P	<i>Piptatherum canadense</i>	Canada Rice Grass				S2	3 Sensitive	5	52.4 ± 0.0	NB
P	<i>Poa glauca</i>	Glaucous Blue Grass				S2	4 Secure	1	60.1 ± 2.0	NB
P	<i>Puccinellia phryganodes</i>	Creeping Alkali Grass				S2	3 Sensitive	15	8.9 ± 0.0	NB
P	<i>Schizachyrium scoparium</i>	Little Bluestem				S2	3 Sensitive	22	72.9 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Zizania aquatica</i> var. <i>aquatica</i>	Indian Wild Rice				S2	5 Undetermined	3	93.1 ± 5.0	NB
P	<i>Potamogeton vaseyi</i>	Vasey's Pondweed				S2	3 Sensitive	10	45.3 ± 0.0	NB
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S2	3 Sensitive	9	57.1 ± 0.0	NB
P	<i>Woodwardia virginica</i>	Virginia Chain Fern				S2	3 Sensitive	19	57.4 ± 1.0	NB
P	<i>Woodsia alpina</i>	Alpine Cliff Fern				S2	3 Sensitive	5	69.4 ± 0.0	NB
P	<i>Selaginella selaginoides</i>	Low Spikemoss				S2	3 Sensitive	4	33.8 ± 0.0	NB
P	<i>Toxicodendron radicans</i>	Poison Ivy				S2?	3 Sensitive	11	50.2 ± 0.0	NB
P	<i>Symphotrichum novibegii</i> var. <i>crenifolium</i>	New York Aster				S2?	5 Undetermined	9	16.1 ± 0.0	NB
P	<i>Humulus lupulus</i> var. <i>lupuloides</i>	Common Hop				S2?	3 Sensitive	4	86.6 ± 0.0	NB
P	<i>Rubus recurvicaulis</i>	Arching Dewberry				S2?	4 Secure	2	51.2 ± 1.0	NB
P	<i>Galium obtusum</i>	Blunt-leaved Bedstraw				S2?	4 Secure	3	92.8 ± 0.0	NB
P	<i>Salix myricoides</i>	Bayberry Willow				S2?	3 Sensitive	7	23.6 ± 0.0	NB
P	<i>Carex vacillans</i>	Estuarine Sedge				S2?	3 Sensitive	4	16.1 ± 1.0	NB
P	<i>Platanthera huronensis</i>	Fragrant Green Orchid				S2?	5 Undetermined	2	47.8 ± 1.0	NB
P	<i>Solidago altissima</i>	Tall Goldenrod				S2S3	4 Secure	6	63.8 ± 0.0	NB
P	<i>Barbarea orthoceras</i>	American Yellow Rocket				S2S3	3 Sensitive	4	47.1 ± 10.0	NB
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S2S3	3 Sensitive	16	37.7 ± 0.0	NB
P	<i>Callitriche hermaphroditica</i>	Northern Water-starwort				S2S3	4 Secure	6	28.5 ± 0.0	NB
P	<i>Lonicera oblongifolia</i>	Swamp Fly Honeysuckle				S2S3	3 Sensitive	13	41.6 ± 6.0	NB
P	<i>Elatine americana</i>	American Waterwort				S2S3	3 Sensitive	8	52.4 ± 1.0	NB
P	<i>Bartonia paniculata</i>	Branched Bartonia				S2S3	3 Sensitive	4	36.1 ± 0.0	NB
P	<i>Bartonia paniculata</i> ssp. <i>iodandra</i>	Branched Bartonia				S2S3	3 Sensitive	14	26.1 ± 1.0	NB
P	<i>Geranium robertianum</i>	Herb Robert				S2S3	4 Secure	17	12.6 ± 0.0	NB
P	<i>Myriophyllum quitense</i>	Andean Water Milfoil				S2S3	4 Secure	71	53.0 ± 0.0	NB
P	<i>Epilobium coloratum</i>	Purple-veined Willowherb				S2S3	3 Sensitive	9	54.2 ± 1.0	NB
P	<i>Rumex pallidus</i>	Seabeach Dock				S2S3	3 Sensitive	6	19.1 ± 1.0	NB
P	<i>Rubus pensilvanicus</i>	Pennsylvania Blackberry				S2S3	4 Secure	9	20.0 ± 3.0	NB
P	<i>Galium labradoricum</i>	Labrador Bedstraw				S2S3	3 Sensitive	3	16.8 ± 0.0	NB
P	<i>Valeriana uliginosa</i>	Swamp Valerian				S2S3	3 Sensitive	2	36.6 ± 1.0	NB
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	4 Secure	3	56.6 ± 1.0	NB
P	<i>Corallorhiza maculata</i> var. <i>occidentalis</i>	Spotted Coralroot				S2S3	3 Sensitive	6	20.4 ± 0.0	NB
P	<i>Corallorhiza maculata</i> var. <i>maculata</i>	Spotted Coralroot				S2S3	3 Sensitive	2	90.6 ± 1.0	NB
P	<i>Listera auriculata</i>	Auricled Twayblade				S2S3	3 Sensitive	9	54.5 ± 1.0	NB
P	<i>Spiranthes cernua</i>	Nodding Ladies'-Tresses				S2S3	3 Sensitive	15	9.6 ± 1.0	NB
P	<i>Eragrostis pectinacea</i>	Tufted Love Grass				S2S3	4 Secure	14	18.9 ± 0.0	NB
P	<i>Stuckenia filiformis</i> ssp. <i>alpina</i>	Thread-leaved Pondweed				S2S3	3 Sensitive	6	60.1 ± 0.0	NB
P	<i>Stuckenia pectinata</i>	Sago Pondweed				S2S3	3 Sensitive	61	18.0 ± 0.0	NB
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S2S3	4 Secure	14	42.2 ± 0.0	NB
P	<i>Isoetes acadensis</i>	Acadian Quillwort				S2S3	3 Sensitive	10	14.1 ± 1.0	NB
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	3 Sensitive	6	41.3 ± 1.0	NB
P	<i>Panax trifolius</i>	Dwarf Ginseng				S3	3 Sensitive	6	53.7 ± 0.0	NB
P	<i>Artemisia campestris</i>	Field Wormwood				S3	4 Secure	3	92.6 ± 0.0	NB
P	<i>Artemisia campestris</i> ssp. <i>caudata</i>	Field Wormwood				S3	4 Secure	28	50.9 ± 0.0	NB
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3	4 Secure	6	46.8 ± 0.0	NB

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P	<i>Prenanthes racemosa</i>	Glaucous Rattlesnakeroot				S3	4 Secure	63	53.9 ± 1.0	NB
P	<i>Tanacetum bipinnatum</i> <i>ssp. huronense</i>	Lake Huron Tansy				S3	4 Secure	22	67.3 ± 1.0	NB
P	<i>Symphotrichum boreale</i>	Boreal Aster				S3	3 Sensitive	12	9.9 ± 0.0	NB
P	<i>Betula pumila</i>	Bog Birch				S3	4 Secure	22	49.6 ± 0.0	NB
P	<i>Arabis hirsuta</i> var. <i>pycnocarpa</i>	Western Hairy Rockcress				S3	4 Secure	13	59.6 ± 0.0	NB
P	<i>Cardamine maxima</i>	Large Toothwort				S3	4 Secure	26	62.8 ± 0.0	NB
P	<i>Subularia aquatica</i> var. <i>americana</i>	Water Awlwort				S3	4 Secure	18	6.2 ± 0.0	NB
P	<i>Lobelia cardinalis</i>	Cardinal Flower				S3	4 Secure	362	3.1 ± 0.0	NB
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S3	4 Secure	6	11.4 ± 0.0	NB
P	<i>Hudsonia tomentosa</i>	Woolly Beach-heath				S3	4 Secure	3	38.0 ± 0.0	NB
P	<i>Cornus amomum</i> ssp. <i>obliqua</i>	Pale Dogwood				S3	3 Sensitive	189	36.8 ± 0.0	NB
P	<i>Crassula aquatica</i>	Water Pygmyweed				S3	4 Secure	9	53.1 ± 1.0	NB
P	<i>Rhodiola rosea</i>	Roseroot				S3	4 Secure	37	5.0 ± 1.0	NB
P	<i>Penthorum sedoides</i>	Ditch Stonecrop				S3	4 Secure	61	3.0 ± 0.0	NB
P	<i>Elatine minima</i>	Small Waterwort				S3	4 Secure	53	7.8 ± 0.0	NB
P	<i>Astragalus alpinus</i> var. <i>brunetianus</i>	Alpine Milk-Vetch				S3	4 Secure	3	85.2 ± 0.0	NB
P	<i>Hedysarum alpinum</i>	Alpine Sweet-vetch				S3	4 Secure	2	81.3 ± 0.0	NB
P	<i>Gentianella amarella</i> <i>ssp. acuta</i>	Northern Gentian				S3	4 Secure	7	59.4 ± 0.0	NB
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	4 Secure	5	19.7 ± 1.0	NB
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S3	4 Secure	22	9.5 ± 0.0	NB
P	<i>Myriophyllum heterophyllum</i>	Variable-leaved Water Milfoil				S3	4 Secure	36	51.7 ± 0.0	NB
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S3	4 Secure	17	6.4 ± 0.0	NB
P	<i>Stachys tenuifolia</i>	Smooth Hedge-Nettle				S3	3 Sensitive	12	80.3 ± 0.0	NB
P	<i>Teucrium canadense</i>	Canada Germander				S3	3 Sensitive	2	51.3 ± 0.0	NB
P	<i>Utricularia radiata</i>	Little Floating Bladderwort				S3	4 Secure	43	8.6 ± 0.0	NB
P	<i>Nuphar lutea</i> ssp. <i>pumila</i>	Small Yellow Pond-lily				S3	4 Secure	14	60.1 ± 0.0	NB
P	<i>Epilobium hornemannii</i>	Hornemann's Willowherb				S3	4 Secure	3	28.7 ± 0.0	NB
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	4 Secure	19	39.1 ± 0.0	NB
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	3 Sensitive	8	73.6 ± 0.0	NB
P	<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb				S3	4 Secure	11	40.9 ± 0.0	NB
P	<i>Polygonum punctatum</i>	Dotted Smartweed				S3	4 Secure	2	86.8 ± 0.0	NB
P	<i>Polygonum punctatum</i> var. <i>confertiflorum</i>	Dotted Smartweed				S3	4 Secure	17	37.1 ± 0.0	NB
P	<i>Polygonum scandens</i>	Climbing False Buckwheat				S3	4 Secure	29	14.1 ± 0.0	NB
P	<i>Littorella uniflora</i>	American Shoreweed				S3	4 Secure	25	4.3 ± 1.0	NB
P	<i>Primula mistassinica</i>	Mistassini Primrose				S3	4 Secure	12	51.7 ± 0.0	NB
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	4 Secure	2	29.0 ± 0.0	NB
P	<i>Clematis occidentalis</i>	Purple Clematis				S3	4 Secure	19	37.1 ± 5.0	NB
P	<i>Ranunculus gmelinii</i>	Gmelin's Water Buttercup				S3	4 Secure	5	91.8 ± 1.0	NB
P	<i>Thalictrum venulosum</i>	Northern Meadow-rue				S3	4 Secure	77	12.1 ± 0.0	NB
P	<i>Amelanchier canadensis</i>	Canada Serviceberry				S3	4 Secure	15	4.0 ± 1.0	NB
P	<i>Rosa palustris</i>	Swamp Rose				S3	4 Secure	39	6.9 ± 0.0	NB
P	<i>Rubus occidentalis</i>	Black Raspberry				S3	4 Secure	22	66.3 ± 0.0	NB
P	<i>Galium boreale</i>	Northern Bedstraw				S3	4 Secure	5	47.0 ± 0.0	NB
P	<i>Salix interior</i>	Sandbar Willow				S3	4 Secure	27	83.5 ± 1.0	NB
P	<i>Salix nigra</i>	Black Willow				S3	3 Sensitive	82	53.7 ± 1.0	NB

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P	<i>Salix pedicellaris</i>	Bog Willow				S3	4 Secure	46	6.4 ± 0.0	NB
P	<i>Parnassia glauca</i>	Fen Grass-of-Parnassus				S3	4 Secure	1	83.1 ± 10.0	NB
P	<i>Limosella australis</i>	Southern Mudwort				S3	4 Secure	10	36.7 ± 5.0	NB
P	<i>Veronica serpyllifolia</i> <i>ssp. humifusa</i>	Thyme-Leaved Speedwell				S3	4 Secure	2	90.6 ± 100.0	NB
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S3	3 Sensitive	139	10.7 ± 0.0	NB
P	<i>Pilea pumila</i>	Dwarf Clearweed				S3	4 Secure	22	82.8 ± 0.0	NB
P	<i>Viola adunca</i>	Hooked Violet				S3	4 Secure	3	15.3 ± 1.0	NB
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S3	4 Secure	7	56.8 ± 0.0	NB
P	<i>Carex aquatilis</i>	Water Sedge				S3	4 Secure	12	15.4 ± 0.0	NB
P	<i>Carex arcta</i>	Northern Clustered Sedge				S3	4 Secure	34	49.9 ± 0.0	NB
P	<i>Carex atratiformis</i>	Scabrous Black Sedge				S3	4 Secure	1	60.1 ± 0.0	NB
P	<i>Carex capillaris</i>	Hairlike Sedge				S3	4 Secure	2	60.1 ± 2.0	NB
P	<i>Carex chordorrhiza</i>	Creeping Sedge				S3	4 Secure	20	32.5 ± 1.0	NB
P	<i>Carex conoidea</i>	Field Sedge				S3	4 Secure	23	19.3 ± 1.0	NB
P	<i>Carex exilis</i>	Coastal Sedge				S3	4 Secure	81	19.7 ± 0.0	NB
P	<i>Carex garberi</i>	Garber's Sedge				S3	3 Sensitive	2	50.9 ± 1.0	NB
P	<i>Carex haydenii</i>	Hayden's Sedge				S3	4 Secure	27	12.1 ± 1.0	NB
P	<i>Carex lupulina</i>	Hop Sedge				S3	4 Secure	99	37.1 ± 1.0	NB
P	<i>Carex michauxiana</i>	Michaux's Sedge				S3	4 Secure	54	6.7 ± 0.0	NB
P	<i>Carex ormostachya</i>	Necklace Spike Sedge				S3	4 Secure	8	53.3 ± 0.0	NB
P	<i>Carex rosea</i>	Rosy Sedge				S3	4 Secure	17	78.3 ± 0.0	NB
P	<i>Carex tenera</i>	Tender Sedge				S3	4 Secure	41	20.7 ± 1.0	NB
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S3	4 Secure	61	32.4 ± 0.0	NB
P	<i>Carex vaginata</i>	Sheathed Sedge				S3	3 Sensitive	10	39.9 ± 6.0	NB
P	<i>Carex wiegandii</i>	Wiegand's Sedge				S3	4 Secure	33	19.0 ± 0.0	NB
P	<i>Carex recta</i>	Estuary Sedge				S3	4 Secure	7	17.4 ± 0.0	NB
P	<i>Cyperus dentatus</i>	Toothed Flatsedge				S3	4 Secure	62	2.0 ± 1.0	NB
P	<i>Cyperus esculentus</i>	Perennial Yellow Nutsedge				S3	4 Secure	24	83.9 ± 0.0	NB
P	<i>Eleocharis intermedia</i>	Matted Spikerush				S3	4 Secure	3	50.1 ± 0.0	NB
P	<i>Eleocharis</i> <i>quinqueflora</i>	Few-flowered Spikerush				S3	4 Secure	4	68.9 ± 0.0	NB
P	<i>Rhynchospora</i> <i>capitellata</i>	Small-headed Beakrush				S3	4 Secure	7	52.0 ± 0.0	NB
P	<i>Rhynchospora fusca</i>	Brown Beakrush				S3	4 Secure	37	6.5 ± 0.0	NB
P	<i>Trichophorum clintonii</i>	Clinton's Clubrush				S3	4 Secure	6	4.8 ± 5.0	NB
P	<i>Schoenoplectus</i> <i>fluviatilis</i>	River Bulrush				S3	3 Sensitive	46	52.5 ± 1.0	NB
P	<i>Schoenoplectus torreyi</i>	Torrey's Bulrush				S3	4 Secure	27	16.8 ± 0.0	NB
P	<i>Lemna trisulca</i>	Star Duckweed				S3	4 Secure	17	71.2 ± 1.0	NB
P	<i>Triantha glutinosa</i>	Sticky False-Asphodel				S3	4 Secure	8	80.2 ± 0.0	NB
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S3	3 Sensitive	19	44.8 ± 1.0	NB
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3	4 Secure	16	34.4 ± 0.0	NB
P	<i>Platanthera</i> <i>blephariglottis</i>	White Fringed Orchid				S3	4 Secure	13	46.6 ± 1.0	NB
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	3 Sensitive	31	0.9 ± 5.0	NB
P	<i>Bromus latiglumis</i>	Broad-Glumed Brome				S3	3 Sensitive	2	55.5 ± 0.0	NB
P	<i>Calamagrostis</i> <i>pickeringii</i>	Pickering's Reed Grass				S3	4 Secure	104	19.3 ± 0.0	NB
P	<i>Dichanthelium</i> <i>depauperatum</i>	Starved Panic Grass				S3	4 Secure	2	55.8 ± 0.0	NB
P	<i>Muhlenbergia</i> <i>richardsonis</i>	Mat Muhly				S3	4 Secure	9	91.5 ± 0.0	NB
P	<i>Heteranthera dubia</i>	Water Stargrass				S3	4 Secure	58	60.0 ± 0.0	NB
P	<i>Potamogeton</i> <i>obtusifolius</i>	Blunt-leaved Pondweed				S3	4 Secure	13	37.6 ± 0.0	NB
P	<i>Potamogeton</i>	Richardson's Pondweed				S3	3 Sensitive	12	60.1 ± 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>richardsonii</i>									
P	<i>Xyris montana</i>	Northern Yellow-Eyed-Grass				S3	4 Secure	25	24.8 ± 0.0	NB
P	<i>Zannichellia palustris</i>	Horned Pondweed				S3	4 Secure	5	53.1 ± 0.0	NB
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S3	4 Secure	7	52.2 ± 1.0	NB
P	<i>Cryptogramma stelleri</i>	Steller's Rockbrake				S3	4 Secure	1	79.8 ± 1.0	NB
P	<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort				S3	4 Secure	15	53.1 ± 1.0	NB
P	<i>Dryopteris fragrans</i> var. <i>remotiuscula</i>	Fragrant Wood Fern				S3	4 Secure	2	57.1 ± 0.0	NB
P	<i>Dryopteris goldiana</i>	Goldie's Woodfern				S3	3 Sensitive	6	91.9 ± 0.0	NB
P	<i>Woodsia glabella</i>	Smooth Cliff Fern				S3	4 Secure	1	90.0 ± 1.0	NB
P	<i>Equisetum palustre</i>	Marsh Horsetail				S3	4 Secure	6	86.7 ± 10.0	NB
P	<i>Isoetes tuckermanii</i>	Tuckerman's Quillwort				S3	4 Secure	20	13.8 ± 1.0	NB
P	<i>Lycopodium sabinifolium</i>	Ground-Fir				S3	4 Secure	5	38.6 ± 1.0	NB
P	<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss				S3	3 Sensitive	2	61.9 ± 1.0	NB
P	<i>Botrychium dissectum</i>	Cut-leaved Moonwort				S3	4 Secure	26	21.6 ± 5.0	NB
P	<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lance-Leaf Grape-Fern				S3	3 Sensitive	11	57.1 ± 0.0	
P	<i>Botrychium simplex</i>	Least Moonwort				S3	4 Secure	10	41.3 ± 0.0	NB
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	4 Secure	9	16.8 ± 0.0	NB
P	<i>Utricularia resupinata</i>	Inverted Bladderwort				S3?	4 Secure	19	24.4 ± 0.0	NB
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S3?	3 Sensitive	18	17.8 ± 1.0	NB
P	<i>Mertensia maritima</i>	Sea Lungwort				S3S4	4 Secure	24	10.5 ± 0.0	NB
P	<i>Lobelia kalmii</i>	Brook Lobelia				S3S4	4 Secure	17	18.3 ± 0.0	NB
P	<i>Suaeda calceoliformis</i>	Horned Sea-blite				S3S4	4 Secure	4	19.0 ± 5.0	NB
P	<i>Myriophyllum sibiricum</i>	Siberian Water Milfoil				S3S4	4 Secure	25	17.8 ± 1.0	NB
P	<i>Stachys pilosa</i>	Hairy Hedge-Nettle				S3S4	5 Undetermined	4	85.7 ± 1.0	NB
P	<i>Utricularia gibba</i>	Humped Bladderwort				S3S4	4 Secure	41	6.4 ± 0.0	NB
P	<i>Rumex maritimus</i>	Sea-Side Dock				S3S4	4 Secure	2	21.0 ± 1.0	NB
P	<i>Potentilla arguta</i>	Tall Cinquefoil				S3S4	4 Secure	31	15.6 ± 1.0	NB
P	<i>Rubus chamaemorus</i>	Cloudberry				S3S4	4 Secure	55	10.1 ± 1.0	NB
P	<i>Geocaulon lividum</i>	Northern Comandra				S3S4	4 Secure	9	20.5 ± 0.0	NB
P	<i>Juniperus horizontalis</i>	Creeping Juniper				S3S4	4 Secure	19	15.3 ± 1.0	NB
P	<i>Cladium mariscoides</i>	Smooth Twigrush				S3S4	4 Secure	42	19.5 ± 0.0	NB
P	<i>Eriophorum russeolum</i>	Russet Cottongrass				S3S4	4 Secure	2	50.8 ± 1.0	NB
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3S4	4 Secure	16	16.1 ± 1.0	NB
P	<i>Spirodela polyrrhiza</i>	Great Duckweed				S3S4	4 Secure	35	39.0 ± 0.0	NB
P	<i>Corallorhiza maculata</i>	Spotted Coralroot				S3S4	3 Sensitive	8	1.2 ± 0.0	NB
P	<i>Calamagrostis stricta</i>	Slim-stemmed Reed Grass				S3S4	4 Secure	1	53.6 ± 2.0	NB
P	<i>Potamogeton oakesianus</i>	Oakes' Pondweed				S3S4	4 Secure	38	7.7 ± 0.0	NB
P	<i>Montia fontana</i>	Water Blinks				SH	2 May Be At Risk	1	21.0 ± 1.0	NB
P	<i>Solidago caesia</i>	Blue-stemmed Goldenrod				SX	0.1 Extirpated	2	62.6 ± 1.0	NB
P	<i>Celastrus scandens</i>	Climbing Bittersweet				SX	0.1 Extirpated	3	83.4 ± 100.0	NB
P	<i>Carex swanii</i>	Swan's Sedge				SX	0.1 Extirpated	45	52.7 ± 1.0	NB

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APPENDIX D

# MBBA Square Summary (19FL70)



### Square Summary (19FL70)

#species (1st alias)		#species (2nd alias)		#hours		#pc done					
poss	prob	conf	total	total	1st	2nd	road				
33	26	17	76	24	33	52	109	7	76.7	15	0

### Region summary (#11: Charlotte)

#squares		#sq with data		#species		#pc done		target #pc	
1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
67	63	59	163	186	616	251			

Target number of point counts in this square: 14 road side, 1 off road (1 in Mature deciduous). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%		
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd	
Canada Goose			12	27	Turkey Vulture †	H		1	30	Common Murre †\$			3	3	
Wood Duck			38	38	Osprey	ON	NY	61	33	Razorbill †\$			3	3	
Gadwall †			1	0	Bald Eagle †	NY	H	38	52	Black Guillemot †\$			20	30	
American Wigeon			14	8	Northern Harrier	P		33	33	Atlantic Puffin †\$			1	1	
American Black Duck	H	FY	52	62	Sharp-shinned Hawk			20	33	Rock Pigeon	FL	H	15	32	
Mallard			9	20	Cooper's Hawk †			1	1	Mourning Dove	FL	FY	46	71	
Blue-winged Teal	P	P	23	5	Northern Goshawk			15	11	Yellow-billed Cuckoo †			0	3	
Green-winged Teal			31	13	Red-should Hawk †			12	5	Black-billed Cuckoo	T		31	20	
Ring-necked Duck	H	FY	34	22	Broad-winged Hawk	T	P	47	52	Eastern Screech-Owl †			0	3	
Greater Scaup †			0	0	Red-tailed Hawk			15	13	Great Horned Owl			26	23	
Common Eider †\$			26	33	Virginia Rail †			0	1	Barred Owl		S	23	47	
Common Goldeneye			4	1	Sora			14	5	Long-eared Owl †		S	6	6	
Hooded Merganser	H	FY	31	35	Semipalmated Plover †			4	0	Short-eared Owl †			3	0	
Common Merganser			41	22	Piping Plover †			0	0	North Saw-whet Owl		S	20	27	
Red-breast Merganser			19	13	Killdeer		NU	47	18	Common Nighthawk †		S	38	33	
Ring-necked Pheasant			7	15	Spotted Sandpiper		DD	H	60	38	Whip-poor-will			17	10
Ruffed Grouse			41	54	Willet			4	5	Chimney Swift †	H	H	31	16	
Spruce Grouse			17	15	Upland Sandpiper †			3	6	Ruby-thr Hummingbird	H	FY	44	72	
Wild Turkey †			4	8	Wilson's Snipe		S	28	25	Belted Kingfisher	ON	T	41	49	
Common Loon	NE	FY	39	38	American Woodcock		H	44	37	Red-head Woodpecker †			1	0	
Pied-billed Grebe			1	5	Black-legged Kittiwake †\$			0	6	Yellow-bellied Sapsucker	H	H	52	40	
Leach's Storm-Petrel †\$			7	3	Bonaparte's Gull †			1	0	Downy Woodpecker	H	FY	46	71	
Double-crest Cormorant †\$			25	22	Laughing Gull †\$			1	1	Hairy Woodpecker	H	NY	50	72	
Great Cormorant †\$			1	3	Ring-billed Gull †\$			0	1	Am Three-toed Woodpecker †			4	0	
American Bittern	FL	H	23	18	Herring Gull †\$			28	32	Black-back Woodpecker		H	26	13	
Least Bittern †			0	1	Great Black-backed Gull †\$			26	28	Northern Flicker	H	T	66	84	
Great Blue Heron †\$	H		36	28	Roseate Tern †\$			1	1	Pileated Woodpecker		H	33	47	
Green Heron †			1	1	Common Tern †\$			11	8	American Kestrel		P	50	40	
Black-crown N.-Heron †\$			14	6	Arctic Tern †\$			6	1	Merlin		A	12	33	

Maritimes Breeding Bird Atlas - Summary Sheet for Square 19FL70 (page 2 of 3)

SPECIES	Code		%	
	1st	2nd	1st	2nd
Olive-sided Flycatcher †			44	27
Eastern Wood-Pewee	S		44	42
Yellow-bellied Flycatcher		T	53	69
Alder Flycatcher	T		61	83
Willow Flycatcher †			1	5
Least Flycatcher		S	50	62
Eastern Phoebe		H	30	64
Gr Crested Flycatcher			31	13
Eastern Kingbird	A	FY	46	37
Blue-headed Vireo	H	NY	61	81
Warbling Vireo †		T	20	8
Philadelphia Vireo			6	15
Red-eyed Vireo	T		66	86
Gray Jay		FY	30	33
Blue Jay	H	FY	55	74
American Crow	H	FY	68	79
Common Raven		FY	68	77
Horned Lark †			4	3
Purple Martin			4	0
Tree Swallow	ON	AE	82	66
North Rgh-wing Swallow †	FL		6	1
Bank Swallow \$	H		52	16
Cliff Swallow \$	ON		60	30
Barn Swallow	H		77	50
Black-capp Chickadee	H	FY	66	86
Boreal Chickadee		AE	33	38
Red-breast Nuthatch	T		52	81
White-breast Nuthatch	H		19	8
Brown Creeper		S	36	35
House Wren †			4	5
Winter Wren	T		66	84
Golden-crown Kinglet		FY	57	81
Ruby-crown Kinglet		S	57	64
Eastern Bluebird †		P	25	40
Veery	T		52	64
Bicknell's Thrush †			15	5
Swainson's Thrush	T		68	74
Hermit Thrush	T	FY	61	83
Wood Thrush †			25	3
American Robin	AY	CF	84	91
Gray Catbird	H	AE	60	72
Northern Mockingbird †			17	6
Brown Thrasher †		CF	6	13
European Starling	AY	FY	63	64
Cedar Waxwing	H	FY	76	86
Ovenbird	T		65	77
North Waterthrush		T	42	50
Black-white Warbler		CF	66	84
Tennessee Warbler		H	46	22
Nashville Warbler	T	CF	61	81
Mourning Warbler	T		36	28
Common Yellowthroat	T	CF	80	86
American Redstart	AY	FY	79	86
Cape May Warbler	H		34	18
Northern Parula	H	FY	63	83
Magnolia Warbler	H	CF	68	86
Bay-breasted Warbler	H	T	50	49
Blackburnian Warbler	H	P	55	66
Yellow Warbler	T	FY	63	57
Chestn-sided Warbler	T	T	55	79
Blackpoll Warbler			22	16
Black-thr Blue Warbler	H	P	22	71
Palm Warbler		CF	28	57
Pine Warbler †			11	28
Yellow-rumped Warbler	H	CF	71	81
Black-thr Green Warbler	T	CF	66	88
Canada Warbler †	T	T	58	66
Wilson's Warbler		T	38	33
Eastern Towhee †			1	0
Chipping Sparrow	T	CF	63	72
Field Sparrow †			4	0
Vesper Sparrow †	H	P	15	6
Savannah Sparrow		CF	52	61
Nelson's Sh.-tail Sparrow			11	6
Song Sparrow	AY	FY	76	76
Lincoln's Sparrow		T	49	42
Swamp Sparrow	T	CF	44	64
White-throat Sparrow	T	FY	80	86
Dark-eyed Junco	H	T	66	79
Scarlet Tanager †		S	23	18
Northern Cardinal		FY	6	16
Rose-breast Grosbeak	AY		53	23
Indigo Bunting	T	CF	12	25
Bobolink	T	FY	42	28
Red-wing Blackbird		FY	53	57
Eastern Meadowlark †			3	0
Rusty Blackbird †			39	13

Maritimes Breeding Bird Atlas - Summary Sheet for Square 19FL70 (page 3 of 3)

SPECIES	Code		%	
	1st	2nd	1st	2nd
Common Grackle	H	CF	60	77
<u>Brown-head Cowbird</u>	H		44	16
<u>Baltimore Oriole</u>	UN		17	10
Pine Grosbeak			15	1
Purple Finch	T	T	73	83
House Finch †		FY	6	5
Red Crossbill †	H	P	22	11
White-winged Crossbill			53	22
Pine Siskin	H	H	53	33
American Goldfinch	H	FY	61	76
Evening Grosbeak			57	16
House Sparrow			20	6

This list includes all species found during the Maritimes Breeding Bird Atlas (1st atlas: 1986-1990, 2nd atlas: 2006-2010) in the region #11 (Charlotte). Underlined species are those that you should try to add to this square (19FL70). They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. "Code" is the code for the highest breeding evidence for that species in square 19FL70 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #11). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), † (rare in the Maritimes) or ♂ (rare in the Maritimes, documentation only required for confirmed records). Current as of 13/10/2017. An up-to-date version of this sheet is available from <http://www.mba-aom.ca/fsp/summaryform.jsp?squareID=19FL70?lang=en>

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