ENVIRONMENTAL IMPACT ASSESSMENT

NACKAWIC MARINA DEVELOPMENT

NACKAWIC, NB

Our File No.: 433-19-C

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EXECUTIVE SUMMARY

The Town of Nackawic is proposing the construction of a marina on the Saint John River waterfront in Nackawic, New Brunswick. The proposed project includes dredging of the site, construction of a concrete wharf, boat launch, watercraft refuelling station and associated shelter, fuel service building and shed, installation of various floating docks, an aboveground petroleum storage tank (AST) and the installation of rip-rap as shoreline protection.

The project would be part of the Destination Nackawic waterfront master plan. This master plan strives to create a new tourism economy, which capitalizes on and preserves the natural attributes of the Nackawic waterfront.

The proposed Nackawic marina meets the definition of *Item q* of Schedule A of the *New Brunswick Environmental Impact Assessment Regulation* "all ports, harbours, railroads or airports" and must therefore undergo registration and environmental review.

An assessment of the potential environmental and socio-economic impacts for the proposed project was completed and no significant adverse environmental impacts were identified for the construction and operation of the proposed marina.

1. THE PROPONENT

1.1 NAME OF PROPONENT

The proponent is the Town of Nackawic.

1.2 ADDRESS OF PROPONENT

Town of Nackawic
115 Otis Drive
Nackawic, NB E6G 2P1

1.3 CHIEF EXECUTIVE OFFICER

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1.5 PROPERTY OWNERSHIP

The project is located on property currently owned by NB Power (land impounded by the NB Power Mactaquac Dam). The Town of Nackawic is currently in talks to purchase the land.

2. THE UNDERTAKING

2.1 NAME OF THE UNDERTAKING

The name of the undertaking is the Nackawic Marina Development.

2.2 BACKGROUND

The Town of Nackawic is proposing to construct a recreational wharf and associated infrastructure near downtown Nackawic. The site is located on PID number 75340315, near civic address 134 Otis Drive, York County, New Brunswick.

The site would be located on the shore of the Saint John River near its confluence with the Nackawic Stream, near the World's Largest Axe monument, sports fields and walking trail. The proposed wharf would be located along a small point adjacent to Otis Beach.

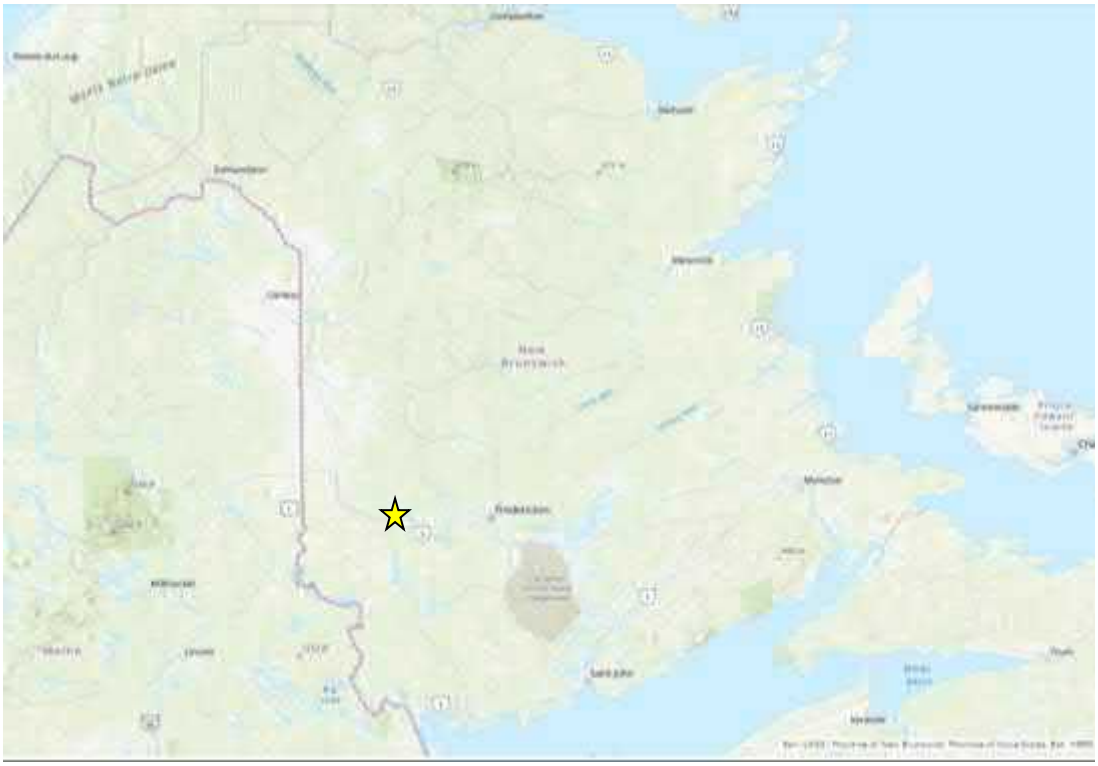

Figure A: Project Location (ArcGIS)

2.3 PROJECT OVERVIEW

The Town of Nackawic is conducting an Environmental Impact Assessment (EIA) as required by the *Environmental Impact Assessment Regulation* for the construction of a recreational wharf and associated infrastructure. The proposed project includes dredging of the site, construction of a concrete wharf, boat

launch, watercraft refuelling station and associated shelter, fuel service building and shed and installation of various floating docks, a 9100-L aboveground petroleum storage tank (AST) and rip-rap as shoreline protection. The development would accommodate up to 80 docked boats when completed.

The proposed project is anticipated to be initiated in the second quarter of 2020 during an anticipated drawdown of the Saint John River headpond by NB Power.

2.4 PURPOSE/RATIONALE/NEED FOR THE UNDERTAKING

Nackawic is an emerging experiential riverfront travel destination, which is based on a dynamic new culture of partnership, investment and entrepreneurship. The Town of Nackawic has a mission to create a new tourism economy, which capitalizes on and preserves the natural attributes of the Nackawic waterfront. In order to fulfil that mission, a Destination Nackawic waterfront master plan was created. This master plan will develop tourism in the area and provide employment opportunities through the construction and use of various attractions. The proposed Nackawic marina and boat launch are part of this master plan, and will aid in promoting water-based activities and tourism in the area. Nackawic is a popular recreational boating and fishing area that would benefit from the addition of a boat launch and marina.

The proponent has invested in the design and planning of the proposed marina development. Therefore, the null, or "do-nothing" alternative is not the preferred option.

2.5 PROJECT LOCATION

The proposed project is located near civic address 134 Otis Drive, in the Town of Nackawic, New Brunswick (York County). The recreational marina will be constructed on the Saint John River waterfront, along a small bay adjacent to Otis Beach. This parcel of land is identified by Service New Brunswick (SNB) as PID No. 75340315.

The subject site is located within the Parish of Southampton, York County and is zoned as P1 – Public Recreation (Town of Nackawic, 2017).

The centre of the proposed wharf location is geo-referenced as LAT 45°59'44.13"N, LONG 67°13'58.75"W.

The project location is bordered to the north by the Town of Nackawic's wastewater treatment plant, to the east by the Saint John River, to the south by the Nackawic Arena, a baseball field and Otis Beach, and to the west by the Nackawic Lions Club Community Centre and Otis Drive.

The area slopes moderately to the east, towards the Saint John River. Surface and groundwater are assumed to flow to the east.

There are no regulated or unmapped wetlands located on the subject property or within 30 metres of the proposed marina. The proposed marina will be located on the waterfront of the Saint John River. The Nackawic Stream enters the Saint John River at Culliton Cove, approximately 400 metres north of the project site.

2.6 SITING CONSIDERATIONS

The project site has a number of favourable elements:

a. The subject property is currently zoned for the intended use;
b. Recreational fishing and boating are common in the area;
c. The Nackawic waterfront is currently used by the public;
d. Preliminary screening of Archaeological Sensitive Areas had low probability or risk;
e. Minimal clearing of vegetation would be required;
f. The site is located within walking distance to Otis Beach, the Nackawic Arena, the Nackawic Shopping Mall, Big Axe Brewery and other tourist attractions;
g. No Important Bird Area or other sensitive environmental features are in proximity to the site and
h. Water levels are consistent due to the operation of the Mactaquac Dam.

2.7 PHYSICAL COMPONENTS AND DIMENSIONS OF THE UNDERTAKING

The proposed development would include the following components:

- Dredging an area of approx. 870 m^2 in the Saint John River to a maximum depth of 4.5 m (dredged materials will be used as backfill on site);
- Construction of a concrete wharf with a footprint of 63.36 m^2 below the ordinary high-water mark;
- Construction of an articulated concrete block boat ramp with a footprint of 294.5 m^2 below the ordinary high-water mark;
- Construction of a fuel service building and shed;
- Clearing and grubbing of approximately 253 m^2 of existing vegetation;
- Installation of a 9100-L aboveground storage tank;
- Stabilizing 155 m of shoreline with large rip rap to a height of 1.1 m and
- On-land construction activities, including temporary stockpiling of materials, paving and landscaping.

Refer to Appendix A for preliminary engineering drawings of the project components.

2.8 APPROVALS

i. Item (q), Schedule A of the *Environmental Impact Assessment (EIA) Regulation* states: "*all ports, harbours, railroads or airports*". Per the Department of Environment and Local Government, the construction of a recreational marina requires registration and review under the EIA process.

ii. A Watercourse and Wetland Alteration Permit would be required as the project is within 30 metres of the Saint John River.

iii. Site approval, environmental approval and storage tank licence for the installation of the aboveground storage tank.

iv. A development permit from the Regional Service Commission 11 for the construction of the fuel service building, shed and shelter for the pumping station.

v. Approval from the Navigation Protection Program of Transport Canada under the *Canadian Navigation Protection Act*.

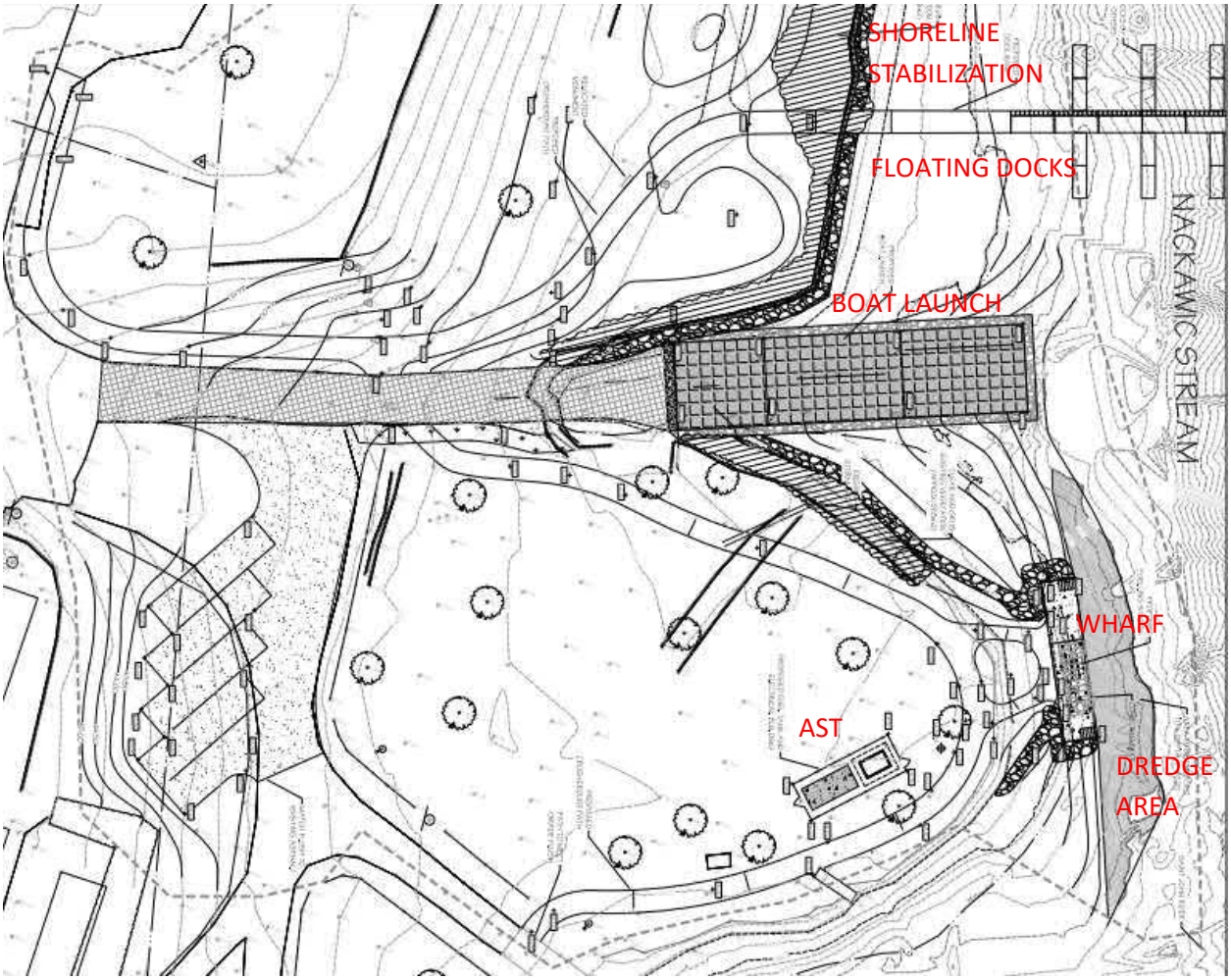

Figure B: Preliminary Drawing of the Project

3. DESCRIPTION OF THE EXISTING ENVIRONMENT

The subject site is located on PID 75340315, owned by NB Power. The site is located on the waterfront of the Saint John River, adjacent to the Nackawic Lions Club Community Centre and the Nackawic arena parking area. The work area consists of cleared park land with ornamental trees and mixed vegetation along the bank of the river.

The subject site is located within the Valley Lowlands Ecoregion, which is the largest of New Brunswick's ecoregions. The Valley Lowlands Ecoregion stretches from Edmundston down to Passamaquoddy Bay, and from the Maine border across almost to the Petitcodiac River. Specifically, the subject site is located within the Meductic Ecodistrict.

"The Meductic Ecodistrict is a gently rolling lowland area that encompasses the middle Saint John River valley between Kilburn and Prince William. Its broad river valley has a pastoral appearance, reflecting the underlying calcareous bedrock and associated arable soils. The ecodistrict's western border coincides with the international boundary, and the northeastern edge is buttressed by more rugged terrain of the adjoining Serpentine Ecodistrict.

The distinctive character of this ecodistrict results in part from its relatively dry, warm climate combined with rich calcareous soils. Its precipitation is lower than in the adjacent Central Uplands Ecoregion, and its lengthy growing season is second only to that of the even warmer Grand Lake Ecoregion.

The original forest cover has been greatly disturbed by more than two centuries of dense settlement. Tolerant hardwood stands once dominated the area but now exist only as small woodlot oases in a widespread agricultural matrix. The few undisturbed ridgetops at low elevation support sugar maple and beech with white ash, ironwood, butternut, and basswood. These communities grade downslope into a mixed forest of sugar maple, balsam fir and beech. Red spruce and hemlock generally are confined to steep slopes. Pines are rare, whereas white spruce and tamarack reveal the location of many old-field sites. Intolerant hardwood species consist mainly of trembling aspen and large-tooth aspen with birch, and are restricted to abandoned farmlands. As much of the original forest has been either converted to agriculture or flooded by hydroelectric dam projects, several elements, especially understorey plants have become scarce." (DNR, 2007)

3.1 TOPOGRAPHY

The subject site is located along the Saint John River waterfront. The general topography of the area IS flat, and gently slopes east toward the Saint John River. Runoff is expected to flow east overland into the Saint John River.

Figure C: Toparama © Map of the Area

3.2 GEOLOGY

The subject site is underlain by Early Devonian-aged Hawkshaw Granite of the Pokiok Plutonic Suite comprised of pink, medium- to coarse-grained, hiatal, megacrystic, biotite granite (Lutes, 2005).

Surficial geology consists of 1) Late Wisconsinan-aged glaciofluvial sediments deposited from ice contact, consisting of eskers, kames, kame and kettle complexes and comprised of sand, gravel, minor silt and till, generally more than 2 metres thick; and 2) Late Wisconsinan-aged morainal sediments deposited as discontinuous veneer over rock comprised of loamy lodgement till, minor ablation till, silt, sand, gravel and rubble, less than 0.5 metres thick (Rampton, 2008).

3.3 GROUNDWATER

The Regional Municipality of Nackawic's nearest groundwater supply is located 1,860 metres southwest of the proposed project. The project is not located within a protected wellfield area. Most commercial and residential buildings in the area obtain their potable water from the municipal supply. A review of the DELG Online Well Log System (OWLS) identified three (3) domestic drinking water wells and two (2) exploratory, non-drinking water wells within 1,100 metres of the proposed marina location. Wells ranged from 26.82 m to 86.87 m in depth.

Photo No. 1: **Town of Nackawic Groundwater Intake**

3.4 SURFACE WATER – WATERCOURSES

The proposed recreational wharf and boat launch will be constructed on the waterfront of the Saint John River. The Saint John River at Nackawic is an impoundment of the Mactaquac Dam hydro generating station and is approximately 700 metres wide at the project location. The Nackawic Stream enters the Saint John River at Culliton Cove, approximately 400 metres north of the marina location.

The NB Power Mactaquac Generating Station was commissioned in 1968. Construction of the station created an approximately 97-km long reservoir (headpond) on the Saint John River that extends from the station to approximately 15 km upstream of the town of Woodstock. The headpond covers approximately 83 km^2 and has a maximum depth of 40 metres. The creation of the headpond resulted in a wider main channel, increased depth and many flooded valleys that previously contained streams. The headpond resembles a lake; however, many of its characteristics are river-like. The headpond is still a river, with slower moving and deeper water.

The Saint John River and the mouth of the Nackawic Stream are popular recreational boating and fishing areas. Smallmouth bass, pickerel and trout are the predominant recreational fish species in Nackawic.

3.5 SURFACE WATER – WETLANDS

There are no unmapped or regulated wetlands in proximity to the subject site. The nearest regulated wetland is located approximately 2.3 km northeast of the project location.

Figure D: GeoNB Map of Regulated Wetlands near Subject Site

3.6 VEGETATION

Vegetation at the site is limited as the proposed project is located on cleared parkland and below the ordinary high-water mark of the Saint John River. Vegetation along the bank of the high-water mark consists mostly of white birch (*Betula papyrifera*), speckled alder (*Alnus nugosa.)*, trembling aspen (*Populus tremuloides*), pussy willow (*Salix discolor*), wild rose (*Rosa sp*.), grass species (Poaceae family), red osier dogwood (*Cornus stolonifera*), balsam poplar (*Populus balsamifera*) and raspberry (*Rubus idaeus*). The remainder of the site is dominated by lawn and ornamental shrubs planted by the Town of Nackawic. Refer to Appendix B for site photos.

Aquatic vegetation observed in the area consists of the invasive species Eurasian water-milfoil (*Myriophyllum spicatum*).

Photo No. 2: Eurasian Water-Milfoil Observed on Site

3.7 WILDLIFE AND WILDLIFE HABITAT

The subject site is used for public recreation and is located within a mixed-use commercial, institutional and residential area. The proposed project site is located along the waterfront of the Saint John River where vegetation is limited. There is minimal use of the site by terrestrial wildlife; however, Canada geese (*Branta canadensis*), common songbirds, gulls and various species of duck commonly congregate along the waterfront.

According to the Mactaquac Aquatic Ecosystem Study (MAES) being carried out by the Canadian Rivers Institute (CRI), the Saint John River is known to contain 53 fish species. Forty-two (42) have been recorded in the area of the Mactaquac Dam. Most are permanent residents in the area and have breeding populations upstream and downstream of the dam. Species that are common and currently present in the Saint John River upstream of the Mactaquac Dam are:

- Threespine stickleback (*Gasterosteus aculeatus*)
- Ninespine stickleback (*Pungitius pungitius*)
- Alewife (*Alosa pseudoharengus*)
- American eel (*Anguilla rostrate*)
- Atlantic salmon (*Salmo salar*)
- Banded killifish (*Fundulus diaphanous*)
- Blacknose dace (*Rhinichthys atratulus*)
- Blacknose shiner (*Notropis heterolepis*)
- Blueback herring (*Alosa aestivalis*)
- Brook trout (*Salvelinus fontinalis*)
- Brown bullhead (*Ameiurus nebulosus*)
- Burbot *(Lota lota*)

- Chain pickerel (*Esox niger*)
- Common shiner (*Notropis cornutus*)
- Creek chub (*Semotilus atromaculatus*)
- Fallfish (*Semotilus corporalis*)
- Golden shiner (*Notemigonus crysoleucas*)
- Lake chub (*Couesius plumbeus)*
- Pumpkinseed (*Lepomis gibbosus*)
- Slimy sculpin (*Cottus cognatus*)
- Smallmouth bass (*Micropterus dolomieu*)
- White perch (*Morone americana*)
- White sucker (*Catostomus commersoni*)
- Yellow perch (*Perca flavecens*)

The abundance and distribution of these aquatic species is governed by the quality and quantity of aquatic habitat. Aquatic habitat in the headpond can be categorized as littoral (shallow water) or open water (deeper) areas. The proposed boat launch and marina are within the littoral zone of the headpond. The littoral zone includes shallow coves and inlets often used by sunfish, perch, catfish and minnows, which feed on invertebrates such as larval insects and snails. The littoral zone is also a favourable hunting ground for predators such as chain pickerel and smallmouth bass (Stantec, 2016). Mussels can also be found along shallow shoreline areas in the headpond.

Roy Consultants completed a site visit on November 22, 2019. Video footage and photos were taken of the nearshore aquatic habitat to identify baseline conditions and aquatic wildlife present. Using a Gopro, video footage and observations were taken along three (3) transect lines (Figure 5). Transect 3 is located in the proposed area to be dredged. At the time of the site visit, the headpond level was low due to a planned drawdown by NB Power. The edge of the water was approximately 12 m from the normal high water mark; Transect length was limited by the presence of ice. Multiple shells of an unidentified mussel species were observed on shore during the survey. The only aquatic flora species that was observed was Eurasian water-milfoil (*Myriophyllum spicatum*), which is an invasive species. Species identification was confirmed by Meghann Bruce, a member of the Canadian Rivers Institute (CRI). The Town of Nackawic and associated stakeholders are aware of this invasive species and mitigation strategies were discussed with CRI. Refer to section 4.3 for mitigation strategies.

Figure E: Transect Line Locations

Based on recorded observations, the aquatic substrate at the subject site is comprised mostly of cobble and gravelly sand with a trace of silt. Large pieces of cobble approximately 10 cm in diameter dominated from the high-water mark down to the end of each transect, where patches of gravelly sand became present. The habitat is largely devoid of flora or fauna, with small clusters of Eurasian water-milfoil located near the end of each transect. A patch of leaf litter was present midway through transect 1. Refer to Appendix C for underwater video photos.

The water's edge was approximately 12 metres from the high-water mark during the site visit. Since the project is located within the Mactaquac Dam impoundment, water levels are controlled by NB Power and the subject site will experience low water levels during the dam's drawdown events. The drawdown events are determined by NB Power on an annual basis and occur in the spring and fall. Therefore, most of the project footprint will be devoid of water twice a year.

3.8 MIGRATORY BIRDS

Environment Canada regulates the protection of migratory birds through the Migratory Birds Convention Act (MBCA), which protects migratory birds, their eggs, nests and their young through the *Migratory Birds Regulations* (MBR).

"Under Section 6 of the *Migratory Birds Regulations* (MBR), no person shall disturb, destroy or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird, or its carcass, skin, nest or egg, except under authority of a permit. It is important to note that under the current MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities. Furthermore, Section 5.1 of the MBCA describes prohibitions related to deposit of substances harmful to migratory birds:

Migratory birds protected by the MBCA include all seabirds except cormorants and pelicans, all waterfowl, all shorebirds and most land birds (birds with principally terrestrial life cycles). Most of these birds are specifically named in the Environment Canada publication, *Birds Protected in Canada under the Migratory Birds Convention Act*, Canadian Wildlife Service Occasional Paper No. 1.

"5.1 (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

(2) No person or vessel shall deposit a substance or permit a substance to be deposited in any place if the substance, in combination with one or more substances, results in a substance — in waters or an area frequented by migratory birds or in a place from which it may enter such waters or such an area — that is harmful to migratory birds."

The majority of migratory birds in this ecodistrict nest between April 15 and August 31, according to Bird Studies Canada's Nesting Calendar Query Tool (with the exception of some early-nesting raptor species and the late-nesting American goldfinch). Clearing of vegetation should be completed outside of the bird nesting period.

The subject site consists mainly of cleared parkland with minimal migratory bird nesting habitat. The waterfront and surrounding area are urbanized and commonly used by the public. Shorebirds and waterfowl forage within the Saint John River and along the shoreline; however, minimal interaction is anticipated with these birds due to the spatial and temporal extent of the project. Taking into

consideration the lack of nesting habitat, timing and location of the project, and minimal loss of vegetation required, no interaction between the project and migratory bird species is anticipated.

3.9 SPECIES AT RISK

Canada's Species at Risk Act (SARA) is one of three major components in the Government of Canada's Strategy for the Protection of Species at Risk. It is designed as a key tool for the conservation and protection of Canada's biological diversity and fulfills an important commitment under the United Nations Convention on Biological Diversity. New Brunswick also has a Species at Risk Act, which complements the federal Act.

The purpose of **SARA** is to:

- Prevent wildlife species from becoming extinct or extirpated (lost from the wild in Canada);
- Help in the recovery of extirpated, endangered or threatened species; and
- Ensure that species of special concern do not become endangered or threatened.

Information was requested from the Atlantic Canada Data Conservation Centre (ACCDC) for observations of rare and/or endangered wildlife species within a 5 km radius of the subject site. A review of each species' habitat requirements was completed and compared with site observations. Refer to Table 1 for S-Rank Definitions and Appendix D for the full ACCDC report.

Table 1: ACCDC S-rank and Rarity Definitions

Atlantic Canada Conservation Data Centre (ACCDC) S-Rank **www.accdc.com/en/rank-definitions.html**	
S-RANK DEFINITIONS	
SX	Extinct or extirpated in province.
SH	Historically occurring but currently undetected in province.
S1	Extremely rare in province.
S2	Rare in province.
S3	Uncommon in province.
S4	Widespread, common and apparently secure in province.
S5	Widespread, abundant and demonstrably secure in province.
SE	Exotic in province.
SA	Accidental, infrequent and outside of range within province.

SNA	Ranking not applicable in province.
SNR	Not yet assessed in province.
BREEDING STATUS QUALIFIERS	
N	**Nonbreeding** - Conservation status refers to the non-breeding population of the species in the province.
B	**Breeding** - Conservation status refers to the breeding population of the species in the province.
M	**Migrant** - 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.
?	**Inexact or uncertain:** Denotes inexact or uncertain numeric rank.
SPECIES AT RISK (SARA) (CANADA AND NEW BRUNSWICK)	
Extirpated	A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern (SC)	A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
NBERD GENERAL STATUS OF WILDLIFE	
At risk	Species for which a formal assessment has been completed, and determined to be at risk of extirpation or extinction. To be described by this category, a species must be either listed as endangered or threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or the New Brunswick equivalent.
May be at risk	Species or populations that may be at risk of extirpation or extinction, and are therefore candidates for a detailed risk assessment by COSEWIC or the New Brunswick equivalent.
Sensitive	Species which are not believed to be at risk of extirpation or extinction, but which may require special attention or protection to prevent them from becoming at risk.
Secure	Species that are not believed to be at risk, may be at risk, or sensitive. These are generally species that are widespread and/or abundant. Although some secure species may be declining, their level of decline is not felt to be a threat to their status in the province.
COSEWIC	
X	Extinct in Canada and elsewhere.
XT	Extirpated in Canada but surviving elsewhere.
E	Endangered in Canada.
T	Threatened in Canada.

V	Vulnerable in Canada.
SC	Special Concern in Canada.
DD	Data Deficient: data inadequate for assessment.
NAR	Not At Risk in Canada.

A search of the Atlantic Canada Conservation Data Centre (ACCDC) database was conducted. The ACCDC provided a list of rare or uncommon plant and wildlife species within a 5-km buffer zone of the site. Seven (7) legally listed fauna and one (1) location-sensitive species were identified in the search. All species were cross-referenced with Schedule 1 of the Species at Risk Act (SARA), the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Schedule A prohibitions of the New Brunswick Species at Risk Act (*Prohibitions Regulation* – Species at Risk Act 2013).

Bank swallow (*Riparia riparia*) is listed on Schedule 1 of SARA, and by COSEWIC as Threatened and is not listed on the Schedule A prohibitions of NB SARA. The bank swallow is a small insectivorous songbird, which breeds in all Canadian provinces and winters primarily in South America. The species breeds in areas with vertical banks, including the banks of watercourses. Breeding sites are often situated near open areas used to forage for insects (COSEWIC 2013). The proximity to a watercourse and presence of open grassy areas make the site ideal for bank swallow foraging, and breeding. Critical habitat for the species has not been identified in New Brunswick. Taking into consideration the spatial and temporal extents of project activities and nature of the work, as well as suitable habitat for the species, interaction between the species and the project is not anticipated.

Barn swallow (*Hirundo rustica*) is listed as Threatened on Schedule 1 of SARA, COSEWIC and on Schedule A prohibitions of NB SARA. In Canada, they inhabit and breed in all provinces and territories. They utilize a variety of habitats for foraging, including grassy fields, pastures, lake and river shorelines, wetlands and subarctic tundra (COSEWIC 2011). Nesting habitat must include structures or cliffs to build nests on and a source of mud such to provide the material for building nests. Critical habitat for the species has not been identified in New Brunswick. Taking into consideration the spatial and temporal extents of project activities and nature of the work, as well as suitable habitat for the species, interaction between the species and the project is not anticipated.

Bobolink (*Dolichonyx oryzivorus)* is listed on Schedule 1 of SARA as Threatened (Species at Risk Public Registry 2018g), as well as by COSEWIC and in Schedule A prohibitions of NB SARA. In Canada, they can be found breeding in the southern portions of each province, from British Columbia to Newfoundland and Labrador. They nest in meadows and agricultural fields with tall grasses (Species at Risk Public Registry 2018g). Taking into consideration the spatial and temporal extents of project activities and nature of the work, as well as suitable habitat for the species, interaction between the species and the project is not anticipated.

Common nighthawk (*Chordeiles minor*) is considered Threatened under Schedule 1 of SARA and the Schedule A prohibitions of NB SARA, and is listed as Special Concern by COSEWIC. The common nighthawk is a medium-sized bird which nests in almost all of North America and in some parts of Central America. Common nighthawks are most commonly observed in a wide range of open, vegetation-free habitats, including beaches, recently cleared forests, rocky outcrops and grasslands (SARA 2015). Critical habitat for the species has not been identified in New Brunswick. Taking into consideration the

spatial and temporal extents of project activities and nature of the work, as well as suitable habitat for the species, interaction between the species and the project is not anticipated.

Eastern wood-pewee (*Contopus virens*) is listed as Special Concern on Schedule 1 of SARA, by COSEWIC and on the Schedule A prohibitions of NB SARA. The eastern wood-pewee is a small forest bird whose diet consists primarily of small, flying insects that are hawked in short flights from a perch in the subcanopy. The eastern wood-pewee is mostly associated with the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in forest stands of intermediate age and in mature stands with little understory vegetation. Critical habitat for the species has not been identified in New Brunswick. Taking into consideration the spatial and temporal extents of project activities and nature of the work, as well as suitable habitat for the species, interaction between the species and the project is not anticipated.

Eastern cougar (*Puma concolor – pop. 1*) is listed as Endangered under NB SARA, but is not listed under SARA and is "Data Deficient" under COSEWIC. One of four subspecies of cougar in Canada, the existence of the eastern cougar is anecdotal. However, based on the location and type of project, interaction between the project and the eastern cougar is not anticipated.

Although not identified by the ACCDC scan as occurring within the 5 km project radius, the bald eagle (*Haliaeetus leucocephalus*) was identified as being a location-sensitive species, which may intersect with the project coordinates:

Bald eagle (*Haliaeetus leucocephalus*) is listed under the NB SARA as Regionally Endangered and is included on the Schedule A prohibitions of NB SARA. The bald eagle is a large, distinctive bird of prey found across Canada and much of North America. Bald eagles nest in large trees, generally near water as fish are a major component of their diet. Bald eagles build the largest nest of any bird in North America and prefer nesting sites near open water (NBDNR 2015). During winter, individuals from the resident population are often found in the southwestern part of the province, where they have access to the Bay of Fundy for fishing. They also feed on carrion and small mammals. Critical habitat for the species has not been identified in New Brunswick. Taking into consideration the spatial and temporal extents of project activities and nature of the work, as well as suitable habitat for the species, interaction between the species and project is not anticipated.

Per the Department of Fisheries' Aquatic Species at Risk's Website, the Saint John River and the Nackawic Stream do not contain any critical habitat for any Aquatic Species at Risk (http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html). Species of Special Concern that can be found in the Saint John River *below* the Mactaquac Dam are yellow Lampmussel and Shortnose sturgeon.

3.10 ENVIRONMENTALLY SIGNIFICANT AREAS

A review of the Nature Trust NB Environmentally Significant Area (ESA) database found one (1) ESA within a 5-km radius of the proposed project site:

Nackawic Roadcuts at Pokiok ESA #565 is located at Pokiok, approximately 4.4 km southwest of the subject site. Devonian coarse-grained granite forms the road cuts on the Trans-Canada Highway immediately east and west of the Nackawic Bridge. Based on the distance from the proposed project site, no interaction between the project and this ESA are anticipated.

3.11 IMPORTANT BIRD AREAS

IBACanada.ca was consulted to determine if any Important Bird Areas (IBA) were located near the proposed project. The nearest IBA, NB010 Lower St. John River (Sheffield/Jemseg), is located approximately 50 km southeast of the project area.

Based on the distance from the proposed project, no interaction between the project and this IBA is anticipated.

3.12 ATMOSPHERIC

One source of industrial emissions, the AV Nackawic pulp mill, is located approximately 2 km northeast of the proposed project site. The facility is required to conduct its operations according to conditions outlined in the Air Quality Approval to Operate issued by the Department of Environment and Local Government. Contaminants of concern that are monitored by the facility are Sulphur Dioxide (SO_2), Fine Particulate Matter ($PM_{2.5}$), and Total Reduced Sulphur (TRS). The mill has been in compliance with the conditions outlined in their Approval to Operate. On occasion, the mill will receive complaints related to odours and dust; however, these complaints and occurrences are not common and are considered a nuisance event as opposed to an environmental or human health concern.

In general, overall air quality in this area is considered acceptable. More information on air quality monitoring results can be found on the DELG Website.

3.13 SOCIO-ECONOMIC

3.13.1 Population and Economy

According to the 2016 Statistics Canada census data, the population of Nackawic is 941 with a median age of 48. The employment rate is 40.7% with 330 people employed. Within the population of employed residents, the main categories of employment are trades, transport and equipment operators, sales and service occupations, and business, finance and administration occupations. Records also indicate that 38.6% of residents travel outside Nackawic for employment.

The proposed project is anticipated to contribute directly and indirectly to the economy of the area through tourism. The construction of the project will result in temporary employment and the operation of the marina will provide seasonal employment. The use of the refuelling station and marina will contribute directly to the economy and increase tourism in the area. The marina is part of the Nackawic waterfront development business plan, which will benefit local businesses, residents and visitors.

3.13.2 Transportation

The project site is located approximately 140 metres east of Otis Drive through a parking area for the Nackawic arena and Lions Club Community Centre. Otis Drive has a speed limit of 50 km/h and runs along the Saint John River until it reaches Route 105 approximately 1 km northwest and 5 km southwest of the project. Landegger Drive intersects Otis Drive near the proposed project site. Multiple subdivision roads branch off Otis Drive northwest of the project site.

The project is located along the waterfront, on the other side of the Lions Club Community Centre parking area and away from the main roads. Therefore, construction and operation of the proposed project is not anticipated to significantly impact transportation on Landegger Drive or Otis Drive. Seasonally, there may be an increase in boat traffic in the area for use of the refuelling station and marina. However, this increase will be marginal as the area is already commonly used for recreational boating and fishing.

3.13.3 Archaeological and Heritage Resources

Per correspondence between the client and the Department of Environment and Local Government, an archaeological survey is not required due to the influence of the Mactaquac Dam.

A review of information provided by www.Historicplaces.ca and the New Brunswick Register of Historic Sites' Website shows there are no heritage sites within a 10 km radius of the proposed project.

3.13.4 Land Use

The project is on land currently owned by NB Power which the Town of Nackawic intends to buy. The area is parkland on the waterfront of the Saint John River. The subject site is located within the Town of Nackawic's zoning area, under the Regional Service Commission 11, and is classified as "P1 – Public Recreation". The proposed marina development is permitted in this area. Refer to the zoning map in Appendix E.

Neighbouring land uses are primarily commercial, institutional and residential. The Nackawic Lions Club Community Centre and Otis Drive are located west of the subject site. Across from Otis Drive is the Nackawic Shopping Mall. The Nackawic arena, Otis Beach, the World's Largest Axe monument and two (2) baseball fields are located to the south. The Saint John River borders the subject site to the east and the Town of Nackawic's wastewater treatment plant is located to the north. The nearest residence is located approximately 200 metres southwest of the project site. Properties in the area across the Saint John River include the Mariner's Point RV Park, forested land and residential housing.

4. ENVIRONMENTAL ASSESSMENT OF POTENTIAL IMPACTS

Based on the project description and the existing environment, the following potential Valued Environmental Components (VECs) were identified and assessed for potential project/environment interactions from the completion of the proposed project:

a) Groundwater Quality;
b) Surface Water Quality;
c) Aquatic Wildlife and Habitat;
d) Soil Quality;
e) Atmospheric Quality;
f) Invasive Species;
g) Employment and
h) Health and Safety.

A qualitative rating system is used to evaluate the potential for interactions between the project and the VECs above. A rating was given to each Valued Environmental Component (VEC) based on the potential interaction between the project and each VEC; it was applied to each VEC according to the information gathered and the professional judgment and experience of the consultant.

0 = No interaction anticipated.
1 = Interaction occurs; however, it is unlikely to result in a significant environmental effect even without mitigation, or it is unlikely to be significant because of mitigation measures.
2 = Interaction could potentially result in an environmental effect.

Where there is a potential for project-VEC interaction (ratings of 1 or 2), further discussion is provided in the following sections. For issues where there is limited interaction (ratings 0 or 1), a rationale is provided and the issue is not discussed further in the present report. Potential project-environment interactions are presented in Table 2.

The potential VECs that have a rating of zero for all activities indicate that particular VEC is not present within or in proximity to the project's footprint. The rationales for excluding these VECs from further assessment are discussed in the following sections.

Significance of potential environmental effects is also evaluated in this section, based on a consideration of four (4) characteristics of the project-VEC interaction:

Likelihood: what is the likelihood of the impact on the VEC?
Severity of the impact (spatial and temporal scales), and
Mitigation: What mitigation measures can be employed to minimize the impact, and how efficient?

Table No. 2: Potential Project-Environment Interactions Matrix

Activities / Potential VEC	Construction/ Installation of the Physical Work	Operation/ Maintenance of the Physical Work	Decommissioning/ Abandonment of the Physical Work	Accidents and Unplanned Events
Biophysical				
Atmospheric Quality	1	1	0	1
Surface Water Quality	1	1	0	1
Aquatic Wildlife and Habitat	1	1	0	1
Invasive Species	1	1	0	0
Soil Quality	1	0	0	1
Groundwater Quality	0	0	0	1
Socio-Economic				
Employment	+1	+1	0	0
Health and Safety	0	0	0	1

4.1 ATMOSPHERIC QUALITY

Existing Conditions:
The AV Nackawic pulp mill is located approximately 2 km northeast of the proposed project. The mill has been in compliance with its Approval to Operate, but occasionally receives complaints related to odours and dust. The Department of Environmental and Local Government (DELG) monitors air quality at a station located in Fredericton, approximately 40 km east of the project site. In general, the overall air quality in this area is considered acceptable.

Project-VEC Interactions, Potential Environmental Effects:
Construction activities may cause a temporary reduction in air quality due to noise, dust and equipment emissions. The potential increase in boat traffic around the marina may also contribute to air pollution.

Description of Potential Impact 1:
The use of heavy equipment and machinery for construction purposes may cause elevated noise levels.

Description of Potential Impact 2:
A reduction in air quality can result from emissions of motorized equipment and vehicles for construction activities.

Description of Potential Impact 3:
Increased traffic of motorized boats near the marina can contribute to air pollution in the area.

Recommended Mitigation 1:
Construction activities must be carried out during times acceptable to local authorities and smaller equipment should be used where possible. Equipment should be well maintained and properly muffled. Contractors should ensure that equipment is in good working order, well maintained and properly muffled.

Recommended Mitigation 2:
In order to reduce emissions, motorized equipment should be well maintained and should not be permitted to idle when not in use.

Recommended Mitigation 3:
In order to reduce boating emissions, unnecessary idling of boats would not be permitted. Signs should be installed reminding boaters and gas station attendants would enforce this restriction.

Significance of Potential Impacts:
The activities associated with dredging and construction of the project are temporary in nature and will be conducted during normal business hours. Boats using the marina and refuelling station will have their engines turned off. Operation of the marina will be seasonal during day light hours. Odours associated with refuelling will be localized and short in duration. Based on the proposed mitigation strategies and the seasonal nature of the marina, impacts to air quality are considered unlikely and not significant.

4.2 SURFACE WATER QUALITY

The proposed project includes dredging and constructing a concrete wharf, boat launch, floating docks and refuelling station along the waterfront of the Saint John River.

Existing Conditions:
At present, there are no structures on the Saint John River in the proposed project location. The project is near the Saint John River's confluence with the Nackawic Stream. The Nackawic wastewater treatment plant is located 140 metres north of the project and discharges effluent into the river. This area is a popular recreational boating and fishing area.

Project-VEC Interactions, Potential Environmental Effects:
Dredging activities could negatively impact water quality in the project area. Petroleum product spills and/or leaks could occur during construction activities and during the operation of the refuelling station at the marina. Accidental spills and unplanned events are discussed in section 5.

Description of Potential Impact 1:
Surface water quality may be adversely impacted by debris or suspended sediment during dredging activities.

Description of Potential Impact 2:
Dredged materials stockpiled on shore can runoff into the Saint John River and reduce water quality.

Description of Potential Impact 3:
During refuelling activities spills may occur, resulting in petroleum products entering the Saint John River.

Recommended Mitigation 1:
Sediment and erosion controls such as silt curtains would be used to isolate the work site. Contractors would be required to check all mitigation equipment regularly to ensure its proper location and use. Contractors would be required to repair or replace any mitigation equipment not functioning and maintain it as needed. An Environmental Protection Plan will be required in the contract as part of the tendering process.

Recommended Mitigation 2:
Stockpiles must be sloped to avoid attracting nesting bank swallows. Proper sediment fencing and other standard erosion controls should be placed between the stockpile and the river to avoid runoff into the Saint John River.

Recommended Mitigation 3:
Work will be conducted during the planned May drawdown; therefore a large percentage of the site will be dry.

Recommended Mitigation 4:
Extra caution should be maintained during pumping activities to avoid releasing fuel into the river. Avoid overfilling tanks and allow the nozzle to drip dry before removing. Signs should be installed reminding boaters, and gas station attendants should enforce this. A spill kit would be maintained on site in case of a spill or leak and staff at the marina should be trained in the use of petroleum product spill kits. A containment boom should be used in the case of larger spills. All spills or leaks should be promptly contained and reported to the appropriate authorities. The Fredericton Department of Environment and Local Government would be contacted and advised of the spill, regardless of the volume, at (506) 444-5149. Should the spill occur after normal business hours, the 24-hour emergency reporting number would be called at 1-800-565-1633.

Fuel stored and dispensed at the marina will be gasoline. According to the California Department of Fish and Wildlife, gasoline tends to evaporate quickly off the surface of water compared to heavier oils. Therefore, small amounts of gasoline that may enter the Saint John River during refuelling activities is anticipated to evaporate.

Significance of Potential Impacts:
The majority of the area to be dredged will be devoid of water during planned drawdown events by NB Power. Dredging and construction activities will be temporary in nature and a floating siltation fence should be used to contain suspended sediments and debris. Taking into consideration the proposed mitigation strategies, impacts to the Saint John River are considered unlikely and not significant.

4.3 AQUATIC WILDLIFE AND HABITAT

Existing Conditions:
At present, there are no structures on the Saint John River in the proposed project location. The project is near the Saint John River's confluence with the Nackawic Stream. This area is a popular recreational boating and fishing area. The proposed boat launch and marina are within the littoral zone of the headpond. Multiple shells of an unidentified mussel species and Eurasian water-milfoil were observed on site.

Project-VEC Interactions, Potential Environmental Effects:
Dredging, construction of the wharf and boat ramp and infilling with rip rap for shoreline stabilization would result in the destruction of fish habitat and dredging activities could displace aquatic species.

Description of Potential Impact 1:
Per correspondence the client received from Fisheries and Ocean (DFO-FFHP file No. 19-HGLF-00315, dated Oct. 30, 2019), DFO determined that the project would result in the alteration and/or destruction of fish habitat.

Description of Potential Impact 2:
Dredging and construction activities below the high-water mark would disturb aquatic species in the project area.

Recommended Mitigation 1:
A site visit was conducted and underwater video footage was taken to determine the type of aquatic habitat found within the area to be dredged. A Fish Habitat Offsetting Plan will be created based on the quality of habitat present.

Recommended Mitigation 2:
Work would be initiated slowly and ramped up as deterrent to aquatic wildlife in the area. Aquatic species are anticipated to move out of the work area upon initiation of construction.

Recommended Mitigation 3:
Work will be conducted during the planned May drawdown; therefore a large percentage of the site will be dry.

Significance of Potential Impacts:
No fish species and only one species of aquatic flora were observed during the site visit conducted by Roy Consultants field personnel. Furthermore, the majority of the area to be dredged will be devoid of water during planned drawdown events by NB Power. Taking into consideration the development of a Fish Habitat Offsetting Plan and the proposed mitigation strategies, impacts to aquatic wildlife and habitat are not considered significant.

4.4 INVASIVE SPECIES

Existing Conditions:
The invasive species Eurasian water-milfoil (*Myriophyllum spicatum*) was identified on site within the proposed dredging area. This species is well established in the headpond (M. Bruce, per communication). The Town of Nackawic and associated stakeholders are aware of this issue and mitigation strategies have been discussed with the Canadian Rivers Institute. Mitigation strategies are presented in this section.

Project-VEC Interactions, Potential Environmental Effects:
Small pieces of Eurasian water-milfoil can develop into new plants and are easily spread when water currents, boat propellers, trailers or fishing gear carry plant fragments to new areas. This species can form dense underwater mats that shade other aquatic plants and can hinder recreational activities such as swimming, boating and fishing. Eurasian water-milfoil can reduce biodiversity by competing aggressively with native plants and can alter fish habitat.

Description of Potential Impact 1:
Construction and dredging activities can lead to the fragmentation of Eurasian water-milfoil and potential spread of this species.

Description of Potential Impact 2:
Dredged materials used as backfill may contain fragments of Eurasian water-milfoil. If dredged materials are used as backfill in close proximity to the river, fragments may runoff into the river and lead to new plant growth.

Description of Potential Impact 3:
Use of the marina may lead to the fragmentation and spread of Eurasian water-milfoil by boat propellers.

Description of Potential Impact 4:
Invasive species can be imported and exported through the use of the boat launch. Species can attach to boats, propellers, trailers, anchors and fishing gear and be transferred to other areas and/or watercourses.

Recommended Mitigation 1:
A barrier such as sediment fencing should be used to isolate the work area and prevent the spread of plant fragments.

Recommended Mitigation 2:
A barrier such as sediment fencing should be used to isolate the work area where backfilling is to take place. Dredged materials should only be used on site where dredging occurred. Dredged materials should not be used in close proximately to another watercourse.

Recommended Mitigation 3:
Boaters are encouraged to avoid disturbing mats of aquatic vegetation while boating and using the marina. A no-wake zone would be established in order to reduce underwater disturbances. Signs educating boaters on the dangers of spreading invasive species such as Eurasian water-milfoil should be posted at the marina.

Recommended Mitigation 4:
Construction equipment should be inspected and cleaned before leaving the site. Signs should be posted at the boat launch to educate boaters on how to prevent the spread of invasive species. Boaters are encouraged to inspect and remove all visible aquatic plants, animals and mud from watercrafts, motors, trailers, fishing gear and any other equipment. After each use, water should be drained from boats, including the live well, bilge and motor. Watercrafts should be washed with high-pressure or hot water, or allowed to dry for 5 days. A boat wash station will be installed on site for boaters to use. All personal gear should be checked, cleaned and dried after each use. Plants, fish and other animals should not be released into a body of water unless they came from that same body of water.

Significance of Potential Impacts:
Eurasian water-milfoil is already well established throughout the headpond. Ice scouring causes the fragmentation and spread of this invasive species annually. Since Eurasian water-milfoil is already established in the project area, dredging, construction and operational activities is not anticipated to significantly contribute to the spread of this species. However, best management practices should be used to prevent the spread of this species to other watersheds. Taking into consideration the mitigation strategies and the pre-existing establishment of Eurasian water-milfoil in the area, impacts of invasive species from the construction and operation of the project are not considered significant.

4.5 SOIL QUALITY AND GROUNDWATER

Soil quality can be impacted in the event of an accidental release of petroleum products or other contaminants, which can adhere to soil particles and remain in the ground, potentially affecting soil biota and groundwater.

Impacts to soil quality and groundwater are addressed in section 5, Accidents and Unplanned Events.

4.6 EMPLOYMENT

The construction of the project would result in temporary employment and the operation of the marina would provide additional seasonal positions. No negative impacts on employment are anticipated for this project.

4.7 HEALTH AND SAFETY

Workplace accidents may occur during construction which could impact the health and safety of contractor employees. Impacts to health and safety are addressed in the following section.

5. ACCIDENTS AND UNPLANNED EVENTS

Accidents can occur during the operation of motorized equipment on site or during the operation of the refuelling station. Accidents involving motorized equipment can often result in an unplanned release of hydrocarbons into the environment which can impact soil, surface and groundwater. Petroleum storage tanks can leak or drip during filling which results in impacts to soil, surface and groundwater. Health and safety of workers may also be impacted during accidents and unplanned events.

Existing Conditions:

Currently, there are no storage tanks at the project location. The proposed marina location is next to the parking area for the Nackawic arena and the Nackawic Lions Club Community Centre. Vehicles use this parking area throughout the year.

Project – VEC Interactions, Potential Environmental Effects:

The project involves the construction of a marina, including a refuelling station for boats. Construction activities and the operation of the refuelling station can lead to accidental spills and/or leaks of petroleum products into the environment which can contaminate soil, surface water and groundwater. Workplace accidents may occur during construction which could impact the health and safety of contractor employees.

Potential Environmental Impact – Soil:

Petroleum storage tanks can leak or drip hydrocarbons during filling, which can contaminate soil. Petroleum contamination of soil can impact soil biota and productivity.

Potential Environmental Impact – Surface Water:

Petroleum contamination of surface water can occur if a leak or release occurs at the refuelling station or from a motorized watercraft (or during a precipitation event near the watercourse). Petroleum can impact water quality and habitat and cause acute mortality in aquatic species.

Potential Environmental Impact – Groundwater:

Petroleum contamination of groundwater can result in localized contamination and, if left unchecked, widespread contamination of an aquifer, rendering groundwater non-potable.

Potential Environmental Impact – Health and Safety:

Accidents and injuries may happen during construction activities as heavy equipment and machinery will be used.

Recommended Mitigation – Spills:

- Construction vehicles and equipment should be checked for lubricants or fuel leaks and maintained in good working order.
- All equipment and machinery should be operated within the manufacturer's recommended parameters.
- Fuelling or lubrication of equipment would not occur within 30 metres of any water body or storm drain.
- All necessary precautions should be taken to avoid spills and contamination of soil and water when handling petroleum products on site.

- The aboveground storage tank (AST) and the refuelling station would be licensed and shall meet the requirements of the *NB Petroleum Product Storage and Handling Regulation;* including spill mitigation measures (e.g. secondary containment).
- A spill kit should be maintained on site in case of a spill or leak.
- Staff at the marina should be trained in the use of petroleum product spill kits.
- In the event of an unplanned release, construction or operational activities should cease, the leak stopped and the petroleum product cleaned up using a spill kit.
- All spills or leaks should be promptly contained and reported to the appropriate authorities. The Fredericton Department of Environment and Local Government would be contacted and advised of the spill, regardless of the volume, at (506) 444-5149. Should the spill occur after normal business hours, the 24-hour emergency reporting number would be called at 1-800-565-1633.

Recommended Mitigation – Health and Safety:

- Contractors hired for construction must be certified, trained and insured for the proposed work.
- Contractors must ensure that their employees follow safe work practices and wear appropriate personal protective equipment (PPE).
- Contractors must ensure that equipment is in proper working order and operated safely.
- Contractors should follow a project-specific Environmental Protection Plan.

6. IMPACT OF THE ENVIRONMENT ON THE PROJECT

The project is located within the impoundment of the Saint John River that was formed by the creation of the Mactaquac hydroelectric dam. Water fluctuations within the headpond are controlled by NB Power through operation of the dam. According to NB Power, increased water flow requires adequate slope on the headpond to continue the natural flow of the river. In order to accomplish this, NB Power lowers the Mactaquac headpond level at the dam to maintain this slope. Therefore, prior to high flow events such as the spring freshet, the water level in the headpond will be low. As such, the project is not anticipated to be affected by flooding or unplanned fluctuations in the water levels in the Saint John River.

According to the proponent, the high-water mark will not affect the cement wharf or the boat launch as these features have been designed to withstand ice buildup. The floating docks will be taken in during winter and the storage tank site is an area not affected by ice. Therefore, river ice is not anticipated to have a negative impact on the project.

Based on the nature of the project and the control of water levels by NB Power, the proposed project is not anticipated to be impacted by the environment.

7. MITIGATION SUMMARY TABLE

The following table summarizes the mitigation and significance identified in sections 4 to 6.

Significance of residual impacts rated as follows:
0=None, 1=Not Likely/Not Significant, 2=Likely/Significant, 3=Unknown, + =Positive, - =Negative

Valued Ecosystem/ Social Component (VEC/VSC)	Description of Potential Project Interaction with VEC/VSC	Required Mitigation	Residual Effects		Further Study or Follow-up
			Likelihood	Significance	
Atmospheric Quality	The use of heavy equipment and machinery for construction purposes may cause elevated noise levels.	▪ Construction activities must be carried out during times acceptable to local authorities; ▪ Smaller equipment should be used where possible; ▪ Contractors should ensure that equipment is in good working order, well maintained and properly muffled.	1	1	0
	A reduction in air quality can result from emissions of motorized equipment and vehicles for construction activities.	Motorized equipment should be well maintained and should not be permitted to idle when not in use.	1	1	0
	Increased traffic of motorized boats near the marina can contribute to air pollution in the area.	In order to reduce boating emissions, unnecessary idling of boats would not be permitted. Signs should be posted, reminding boaters; gas station attendants would enforce this restriction.	1	1	0
Surface Water Quality	Surface water quality may be adversely impacted by debris or suspended sediments during dredging activities.	▪ Sediment and erosion controls such as silt curtains would be used to isolate the work site. ▪ Contractors would be required to check all mitigation equipment regularly to ensure its proper location and use. ▪ Contractors would be required to repair or replace any mitigation equipment not functioning and maintain it as needed. ▪ An Environmental Protection Plan will be included in the contract as	1	1	0

		part of the tendering process.			
	Dredged materials stockpiled on shore can runoff into the Saint John River and reduce water quality.	▪ Stockpiles must be flattened to avoid attracting nesting bank swallows. ▪ Proper sediment fencing and other standard erosion controls should be placed between the stockpile and the river to avoid runoff into the Saint John River.	1	1	0
	During refuelling activities, spills may occur, resulting in petroleum products entering the Saint John River.	▪ Extra caution should be maintained during pumping activities to avoid releasing fuel into the river. ▪ Avoid overfilling tanks and allow the nozzle to drip dry before removing. ▪ Signs should be posted, reminding boaters; gas station attendants should enforce this. ▪ A spill kit would be maintained on site in case of a spill or leak and staff at the marina should be trained in the use of petroleum product spill kits. ▪ A containment boom should be used in the case of larger spills. ▪ All spills or leaks should be promptly contained and reported to the appropriate authorities. The Fredericton Department of Environment and Local Government would be contacted and advised of the spill, regardless of the volume, at (506) 444-5149. Should the spill occur after normal business hours, the 24-hour emergency reporting number would be called at 1-800-565-1633.	1	1	0
Aquatic Wildlife and Habitat	Per correspondence the client received from Fisheries and Ocean (DFO-FFHP file No. 19-HGLF-00315, dated Oct. 30, 2019), DFO determined that the project would result in the alteration and/or destruction of fish habitat.	A site visit was conducted and underwater video footage was taken to determine the type of aquatic habitat found within the area to be dredged. A Fish Habitat Offsetting Plan will be created based on the quality of habitat present.	2	1	0

	Dredging and construction activities below the high-water mark would disturb aquatic species in the project area.	Work would be initiated slowly and ramped up as deterrent to aquatic wildlife in the area. Aquatic species are anticipated to move out of the work area upon initiation of construction.	2	1	0
Invasive Species	Construction and dredging activities can lead to the fragmentation of Eurasian water-milfoil and potential spread of this species.	A barrier such as sediment fencing should be used to isolate the work area and prevent the spread of plant fragments.	1	1	0
	Dredged materials used as backfill may contain fragments of Eurasian water-milfoil. If dredged materials are used as backfill in close proximity to the river, fragments may runoff into the river and lead to new plant growth.	▪ A barrier such as sediment fencing should be used to isolate the work area where backfilling is to take place. ▪ Dredged materials should only be used on site where dredging occurred. ▪ Dredged materials should not be used in close proximately to another watercourse.	1	1	0
	Use of the marina may lead to the fragmentation and spread of Eurasian water-milfoil by boat propellers.	▪ Boaters are encouraged to avoid disturbing mats of aquatic vegetation while boating and using the marina. ▪ A no-wake zone would be established in order to reduce underwater disturbances. ▪ Signs educating boaters on the dangers of spreading invasive species such as Eurasian water-milfoil should be posted at the marina.	1	1	0
	Invasive species can be imported and exported through the use of the boat launch. Species can attach to boats,	▪ Construction equipment should be inspected and cleaned before leaving the site. ▪ Signs should be posted at the boat launch to educate boaters on how	1	1	0

	propellers, trailers, anchors and fishing gear and be transferred to other areas and/or watercourses.	to prevent the spread of invasive species. ▪ Boaters are encouraged to inspect and remove all visible aquatic plants, animals and mud from watercrafts, motors, trailers, fishing gear and any other equipment. ▪ After each use, water should be drained from boats, including the live well, bilge and motor. Watercrafts should be washed with high pressure or hot water, or allowed to dry for 5 days. ▪ A washing station will be installed on site for boaters to use.			
Soil and Groundwater Quality	Soil quality can be impacted in the event of an accidental release of petroleum products or other contaminants, which can adhere to soil particles and remain in the ground, potentially affecting soil biota and groundwater.	For mitigation strategies, see Accidents and Unplanned events.	1	1	0
Accidents and Unplanned Events	Accidents can occur during the operation of motorized equipment on site or during the operation of the refuelling station. Accidents involving motorized equipment can often result in an unplanned release of hydrocarbons into the environment which can impact soil, surface and groundwater. Petroleum storage tanks can leak or drip during filling which results in impacts to soil, surface and groundwater.	▪ Vehicles and equipment should be checked for lubricants or fuel leaks and maintained in good working order. ▪ All equipment and machinery should be operated within the manufacturer's recommended parameters. ▪ Fuelling or lubrication of equipment would not occur within 30 metres of any water body or storm drain. ▪ All necessary precautions should be taken to avoid spills and contamination to the soil and water when handling petroleum products on site. ▪ The aboveground storage tank (AST) used at the refuelling station would be licensed and shall meet the requirements of the NB Petroleum Product Storage and	1	1	0

		Handling Regulation. ▪ A spill kit should be maintained on site in case of a spill or leak. ▪ Staff at the marina should be trained in the use of petroleum product spill kits. ▪ In the event of an unplanned release, construction or operational activities should cease, the leak stopped and the petroleum product cleaned up using a spill kit. ▪ All spills or leaks should be promptly contained and reported to the appropriate authorities. The Fredericton Department of Environment and Local Government would be contacted and advised of the spill, regardless of the volume, at (506) 444-5149. Should the spill occur after normal business hours, the 24-hour emergency reporting number would be called at 1-800-565-1633.			
Employment	The construction of the project would result in temporary employment and the operation of the marina would provide additional seasonal positions. No negative impacts on employment are anticipated for this project.	No mitigation required.	+2	+2	0
Health and Safety	Workplace accidents may occur during construction and use of heavy equipment which could impact the health and safety of contractor employees.	▪ Contractors hired for construction must be certified, trained and insured for the proposed work. ▪ Contractors must ensure that their employees follow safe work practices and wear appropriate personal protective equipment (PPE). ▪ Contractors must ensure that equipment is in proper working order and operated safely. ▪ Contractors should follow a project-specific Environmental Protection Plan.	1	1	0

8. PUBLIC INVOLVEMENT

The public involvement activities proposed for this project registration will be conducted as per the requirements of Schedule C of the *Guide to Environmental Impact Assessment in New Brunswick (2012)*, and will include the following public involvement activities, based on a program submitted to and approved by DELG:

1. The proponent shall communicate directly with elected officials (i.e. the MLA and mayor), local service districts, community groups, environmental groups and other key stakeholder groups (companies, agencies, interest groups, etc.) and First Nations as appropriate, enabling them to become familiar with the proposed project and ask questions and/or raise concerns. A 25-day review period would be implemented.

2. The proponent shall provide direct, written notification (letter, information flyer, etc.) about the project and its location to potentially affected area residents, landowners and individuals (to be determined in consultation with Sustainable Development, Planning and Impact Evaluation Branch). The notification must include the following:
    a. A brief description of the proposed project;
    b. Information on how to view the Registration Document;
    c. A description of proposed location (map is desirable);
    d. The status of the Provincial approvals process (i.e.: "The project is currently registered for review with the Department of Environment and Local Government under the Environmental Impact Assessment Regulation, Clean Environment Act");
    e. A statement indicating that people can ask questions or raise concerns with the proponent regarding the environmental impacts;
    f. Proponent contact information (name, address, phone number, E-mail) and
    g. The date by which comments must be received (See Section 6.0 of the Registration Guide).

3. When the EIA report is registered, a copy would be submitted and placed on the DELG Website at http://www.gnb.ca/0009/0377/0002/0016-e.pdf and shall make the Registration Document (and any subsequent submissions in response to issues raised by the Technical Review Committee) available for public review at 20 McGloin Street, 2nd Floor, Fredericton, New Brunswick

4. The proponent shall make copies of the project registration document (and any subsequent submissions in response to issues raised by the Technical Review Committee) available to any interested member of the public, stakeholder or First Nation and shall deposit a copy of this document along with any subsequent revision with the appropriate DELG regional office, where it will be available for public review.

5. Within 60 days of project registration, the proponent shall prepare and submit to the Department of Environment and Local Government a report documenting the above public involvement activities and shall make this report available for public review.

The public involvement strategy was submitted under separate cover to the DELG Project Manager and approved. A summary report outlining the strategy and its results will be submitted for review within 60 days of the date of registration.

In addition to the requirements of the Environmental Impact Assessment Regulation, the amended Canadian Navigable Waters Act requires a 30-day public consultation period, as well as a newspaper ad

and sign posted at the site. An ad was placed in the Woodstock Bugle on January 24, 2020, and a sign was posted at the site on the same date.

9. FIRST NATIONS

The Town of Nackawic has initiated discussions with the Wolastoqey Nation in New Brunswick (WNNB) regarding the proposed marina. In their correspondence letter, WNNB stated the project is not located on Crown land, and appears to be outside the 80m buffer with respect to archaeological resources; however, WNNB also indicated that the Wolastoqiyik have a direct interest in continued access to this land, and have concerns with respect to "…unforeseen consequences, specific to Wolastoqey Aboriginal and Treaty Rights. This may present itself in the form of limitations to access, added competition or conflict over resource use, and pollution." The letter also indicates that the "…promise of continued access and consultation may mitigate these potential pitfalls, so we emphasize here that this continued relationship is a necessary one."

The Town of Nackawic have advised the WNNB that they do not intend to limit access to the site and will continue to collaborate with the Wolastoqey as the project proceeds.

As required by the provincial EIA process, project descriptions have also been sent to the WNNB and Wolastoqey First Nations at Woodstock, Kingsclear, St. Mary's and Oromocto.

In addition to the above, the Government of Canada has initiated consultation with Indigenous Peoples as part of the requirements for funding through the Atlantic Canada Opportunities Agency, as well as required by the Fisheries Act (Fisheries Act Authorization) and the Canada Navigable Waters Act (License to Construct).

10. APPROVAL OF THE UNDERTAKING

The following permits, approvals and authorizations are anticipated for the project to include, but not be limited to:

Provincial

- Certificate of Determination (NB DELG)– NB Environmental Impact Assessment Regulation
- Petroleum Storage Licence (NB DELG) – NB Petroleum Products Handling and Storage Regulation
- Development Permit (Regional Service Commission 11) – NB Community Planning Act
- Watercourse and Wetland Alteration Permit (NB DELG) – NB Watercourse and Wetland Alteration Regulation

Federal

- Approval under the Canadian Navigable Waters Act – Navigation Protection Program of Transport Canada
- Fisheries Act Authorization – Department of Fisheries and Oceans

11. FUNDING

The project is funded jointly by the Town of Nackawic (the proponent) and the Atlantic Canada Opportunities Agency (ACOA).

12. CLOSING STATEMENT

This environmental impact assessment identified Valued Environmental Components, which may potentially be impacted by the project. Significance was determined based on the criteria of *likelihood, scale*, *duration* and proposed *mitigation*.

VECs were identified and assessed as either not potentially impacted by the project, or potential impacts were not considered significant based on the above criteria.

13. REFERENCES CITED

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APPENDIX A:

Engineering Drawings

APPENDIX B:

Site Photos

APPENDIX C:

Underwater Video Photos

APPENDIX D:

ACCDC Report

APPENDIX E:

Zoning Map

APPENDIX F:

Correspondence with the Department of Fisheries and Oceans

APPENDIX G:

Correspondence with Transport Canada

APPENDIX A:

Engineering Drawings

NACKAWIC STREAM

SCALE : 1:200
0m 2m 4m 6m 8m 10m 12m 16m 20m

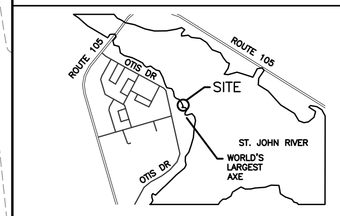
DOCKS BY OTHERS
FUTURE DOCK RAMP (N.I.C.)
PROPOSED DOCK RAMP
EXISTING APPROX. LOW WATER LEVEL 39.00
EXISTING NORMAL WATER LEVEL 39.89
EXISTING HIGH WATER LEVEL 40.50
MATCH FLUSH TO EXISTING GRADE
CLEAR AND GRUB EXISTING VEGETATION (APPROX. 253m2)
FUTURE DOCK RAMP (N.I.C.)
FUTURE PATH (N.I.C.)
PROPOSED BOAT LAUNCH
CLEAR AND GRUB EXISTING VEGETATION (APPROX. 253m2)
EXISTING STORM PIPE
AREA TO BE DREDGED TO A DEPTH OF 37.20
SAINT JOHN RIVER
PROPOSED FUELLING STATION
CONC. WHARF
PROPOSED FUEL TANK AND ELECTRICAL BUILDING
RELOCATED MONUMENT
PROPOSED CRUSHERDUST PATH
PROPOSED CRUSHERDUST PATH
PATH TO MEET GRADE FLUSH
MATCH FLUSH TO EXISTING ASPHALT

CAD FILE: 1908.R - LX - ENVIRONMENTAL.DWG

REVISIONS

No.	DESCRIPTION	DATE
1	xxx	xx.xx.xxxx

KEY MAP



LEGEND

- EXISTING CONTOUR
- EXISTING TREE
- EXISTING WATER LEVEL
- EXISTING TOP/BOTTOM OF SLOPE
- EXISTING FENCE
- PROPERTY LINE
- PROPOSED CONCRETE SLAB
- PROPOSED BOAT LAUNCH
- PROPOSED GRAVEL PAVING
- PROPOSED WHARF
- PROPOSED R-100 RIP RAP
- PROPOSED R-500 RIP RAP
- PROPOSED TURF AREA
- PROPOSED FENCE
- PROPOSED CONTOUR
- + 61.74 PROPOSED SPOT ELEVATION
- + 61.74 BL PROPOSED TOP OF BOAT LAUNCH ELEVATION
- + 61.74 TW PROPOSED TOP OF WHARF ELEVATION
- + 61.74 LB PROPOSED TOP OF LIGHT BASE ELEVATION
- PROPOSED LIGHT STANDARD
- MATCH TO EXISTING GRADE
- AREA TO BE DREDGED TO A DEPTH OF 37.20
- EXISTING GRADE

DETAIL REFERENCE NODE

1/L6 DETAIL NUMBER / SHEET NUMBER

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. THE LAND TOPOGRAPHIC SURVEY WAS PERFORMED ON NOVEMBER 7TH, 8TH, AND 15TH 2018 AND THE BATHYMETRIC SURVEY WAS PERFORMED ON NOVEMBER 15TH 2018 AND MAY 22ND 2019 BY CRANDALL ENGINEERING LTD. USING GPS. ALL ELEVATION ARE GEODETIC IN METRES. CONTACT CONSULTANT IF ANY FURTHER INFORMATION ABOUT THE SURVEYS IS NEEDED.
3. ALL COMPUTATIONS PERFORMED AND COORDINATES SHOWN ON THIS PLAN ARE BASED ON NEW BRUNSWICK STEREOGRAPHIC DOUBLE PROJECTION AND THE NAD83(CSRS) ELLIPSOID AS REALIZED BY SERVICE NEW BRUNSWICK ADJUSTED COORDINATE SURVEY MONUMENTS.
4. LOCATION AND SIZE OF UNDERGROUND SERVICES WERE DERIVED FROM VARIOUS SOURCES AND ARE APPROXIMATE ONLY. ACTUAL LOCATION SHOULD BE VERIFIED PRIOR TO ANY CONSTRUCTION ACTIVITY.
5. REPORT ANY DISCREPANCIES TO LANDSCAPE ARCHITECT.
6. ALL DIMENSIONS, MEASURED FACE TO FACE.
7. RESTORE ALL DISTURBED AREAS TO ORIGINAL CONDITIONS OR BETTER.

STAMP

GLENN GROUP INC.
LANDSCAPE ARCHITECTS & PARK PLANNERS
PH: (506)455-2473
FAX: (506)459-2685

PROJECT TITLE
NACKAWIC MARINA
Nackawic , NB

DRAWING NAME
ENVIRONMENTAL PLAN

DATE PRINTED: 1.21.2020	DESIGNED BY: DKG
DRAWN BY: JMC	CHECKED BY: DKG
CLIENT PROJECT No.:	GG PROJECT NO: 1908
SCALE: 1:200	DATE: 01.21.2020
SHEET NUMBER	1 OF 1

APPENDIX B:

Site Photos

Photo No. 1: Proposed Boat Launch Area, Facing East

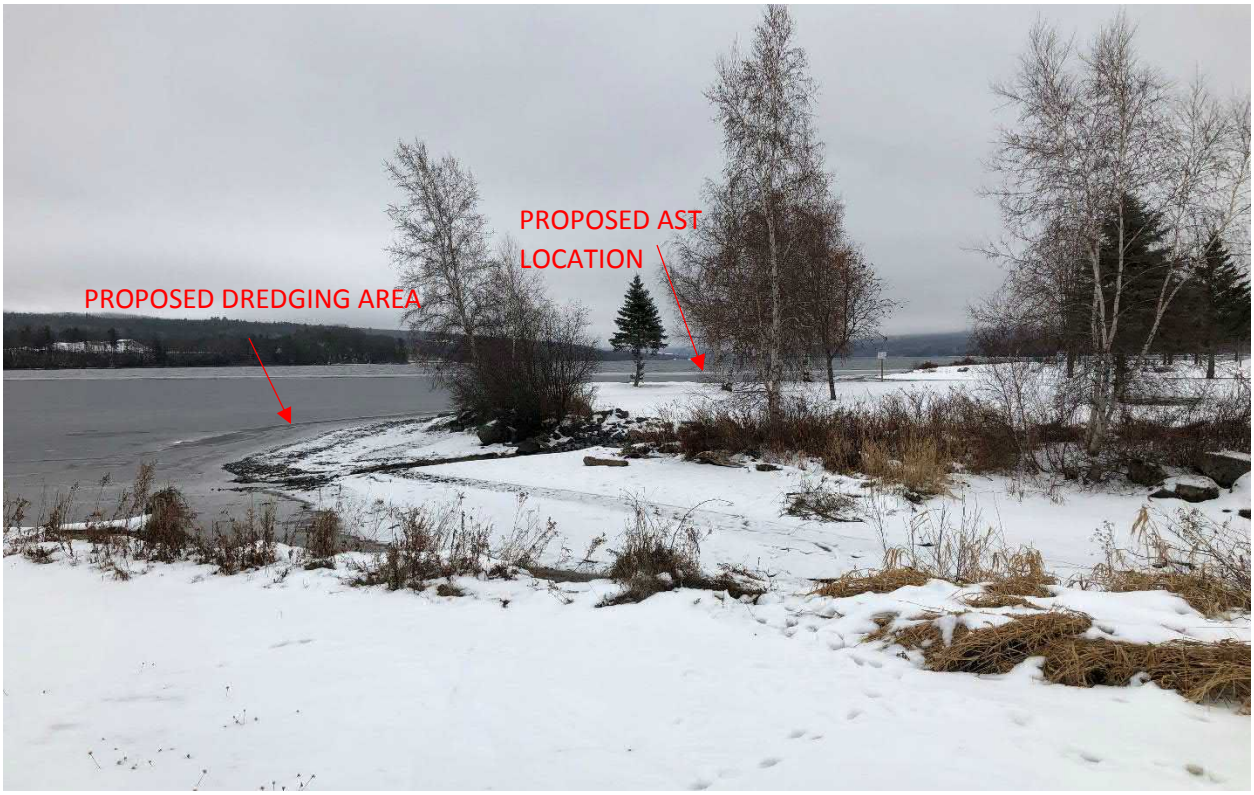


Photo No. 2: Overview of Site, Facing South

Photo No. 3: Proposed Dredging Area, Facing East

Photo No. 4: Boat Launch Area, Facing West

Photo No. 5: Vegetation Along River Bank, Facing East

Photo No. 6: Proposed Area for Floating Docks, Facing North

Photo No. 7: Proposed Area for Floating Docks, Facing South

Photo No. 8: Overview of Site, Facing North

APPENDIX C:

Underwater Video Photos

Transect 1:

Photo No. 1: Substrate at Beginning of Transect

Photo No. 2: Substrate Change Midway Through Transect

Photo No. 3: Leaf Litter Near End of Transect

Photo No. 3: Vegetation at End of Transect

Transect 2:

Figure No. 5: Beginning Substrate of Transect

Photo No. 6: Unidentified Green Algae Near Beginning of Transect

Photo No. 7: Vegetation Midway Through Transect

Photo No. 8: Vegetation At End of Transect

Transect 3:

Photo No. 9: Substrate at Beginning of Transect

Photo No. 10: Vegetation and Mussel Midway Through Transect

Photo No. 11: Unidentified Green Algae at End of Transect

Photo No. 12: Substrate Change at End of Transect

APPENDIX D:

ACCDC Report

DATA REPORT 6236: Nackawc Riverfront, NB

Prepared 3 November 2018
by J. Churchill, Data Manager

CONTENTS OF REPORT

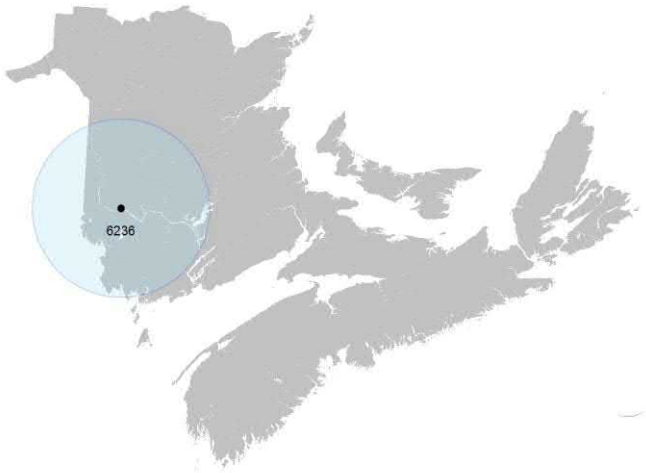
1.0 Preface
- 1.1 Data List
- 1.2 Restrictions
- 1.3 Additional Information
- Map 1: Buffered Study Area

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 (AC CDC; www.accdc.com) 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 AC CDC 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 AC CDC is supported by 6 federal agencies and 4 provincial governments, as well as through outside grants and data processing fees.

Upon request and for a fee, the AC CDC 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 AC CDC 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
NackawcRiverNB_6236ob.xls	All Rare and legally protected *Flora and Fauna* in your study area
NackawcRiverNB_6236ob100km.xls	A list of Rare and legally protected *Flora and Fauna* within 100 km of your study area
NackawcRiverNB_6236ma.xls	All *Managed Areas* in your study area
NackawcRiverNB_6236sa.xls	All *Significant Natural Areas* in your study area
NackawcRiverNB_6236ff.xls	Rare and common *Freshwater Fish* in your study area (DFO database)

1.2 RESTRICTIONS

The AC CDC 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 AC CDC 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 AC CDC 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) AC CDC 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) AC CDC 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 AC CDC data response.

1.3 ADDITIONAL INFORMATION

The accompanying Data Dictionary provides metadata for the data provided.

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

Plants, Lichens, Ranking Methods, All other Inquiries
Sean Blaney, Senior Scientist, Executive Director
Tel: (506) 364-2658
sean.blaney@accdc.ca

Animals (Fauna)
John Klymko, Zoologist
Tel: (506) 364-2660
john.klymko@accdc.ca

Plant Communities
Sarah Robinson, Community Ecologist
Tel: (506) 364-2664
sarah.robinson@accdc.ca

Data Management, GIS
James Churchill, Data Manager
Tel: (902) 679-6146
james.churchill@accdc.ca

Billing
Jean Breau
Tel: (506) 364-2657
jean.breau@accdc.ca

Questions on the biology of Federal Species at Risk can be directed to AC CDC: (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 Hubert Askanas, Energy and Resource Development: (506) 453-5873.

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 Donna Hurlburt, NS DLF: (902) 679-6886. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NS DLF Regional Biologist:

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

Western: Sarah Spencer
(902) 634-7555
Sarah.Spencer@novascotia.ca

Central: Shavonne Meyer
(902) 893-6350
Shavonne.Meyer@novascotia.ca

Central: Kimberly George
(902) 890-1046
Kimberly.George@novascotia.ca

Eastern: Lisa Doucette
(902) 863-4513
Lisa.Doucette@novascotia.ca

Eastern: Terry Power
(902) 563-3370
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

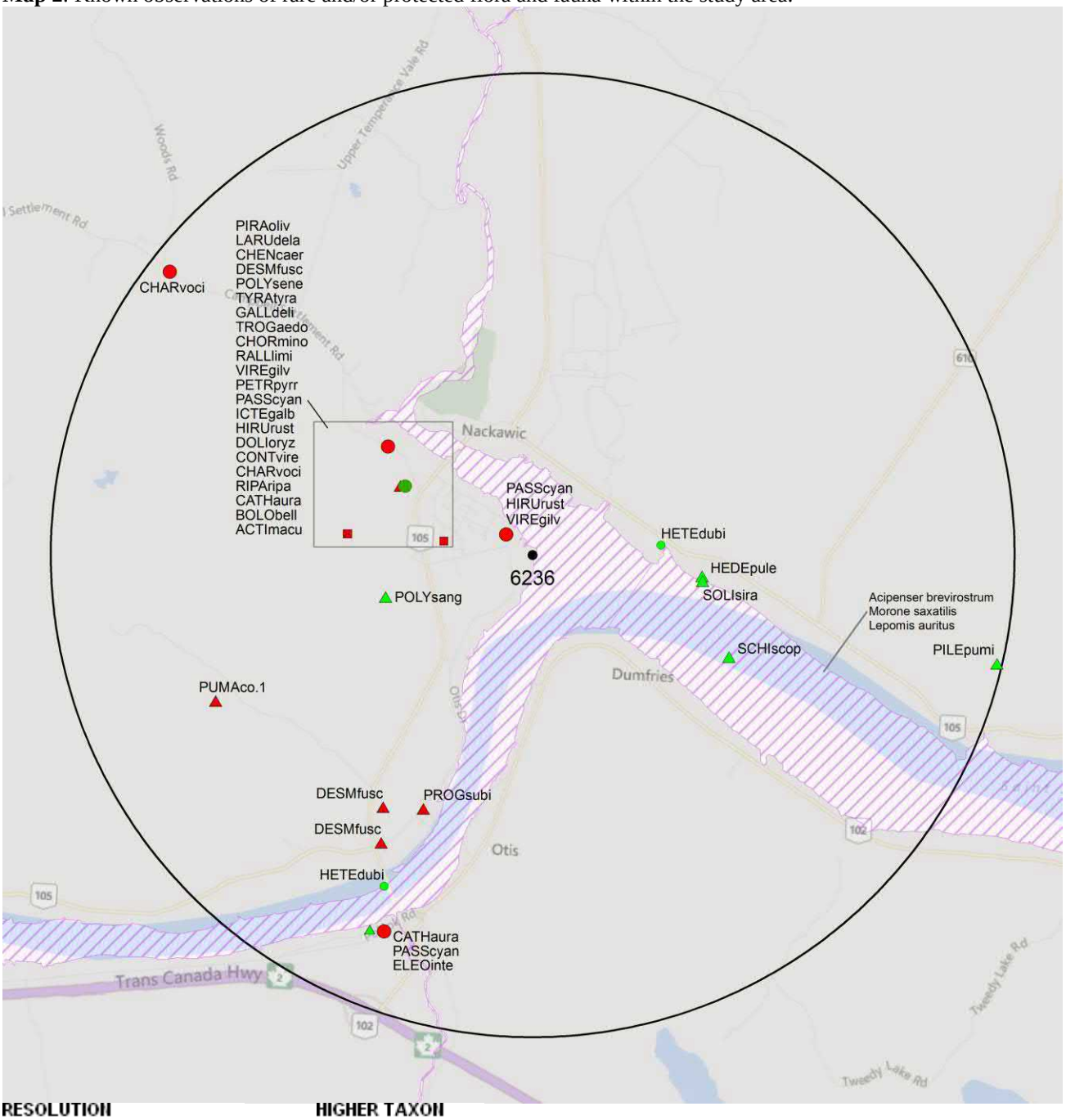
2.1 FLORA

The study area contains 12 records of 8 vascular, no records of nonvascular flora (Map 2 and attached: *ob.xls).

2.2 FAUNA

The study area contains 78 records of 22 vertebrate, 1 record of 1 invertebrate fauna (Map 2 and attached data files - see 1.1 Data List). Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

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

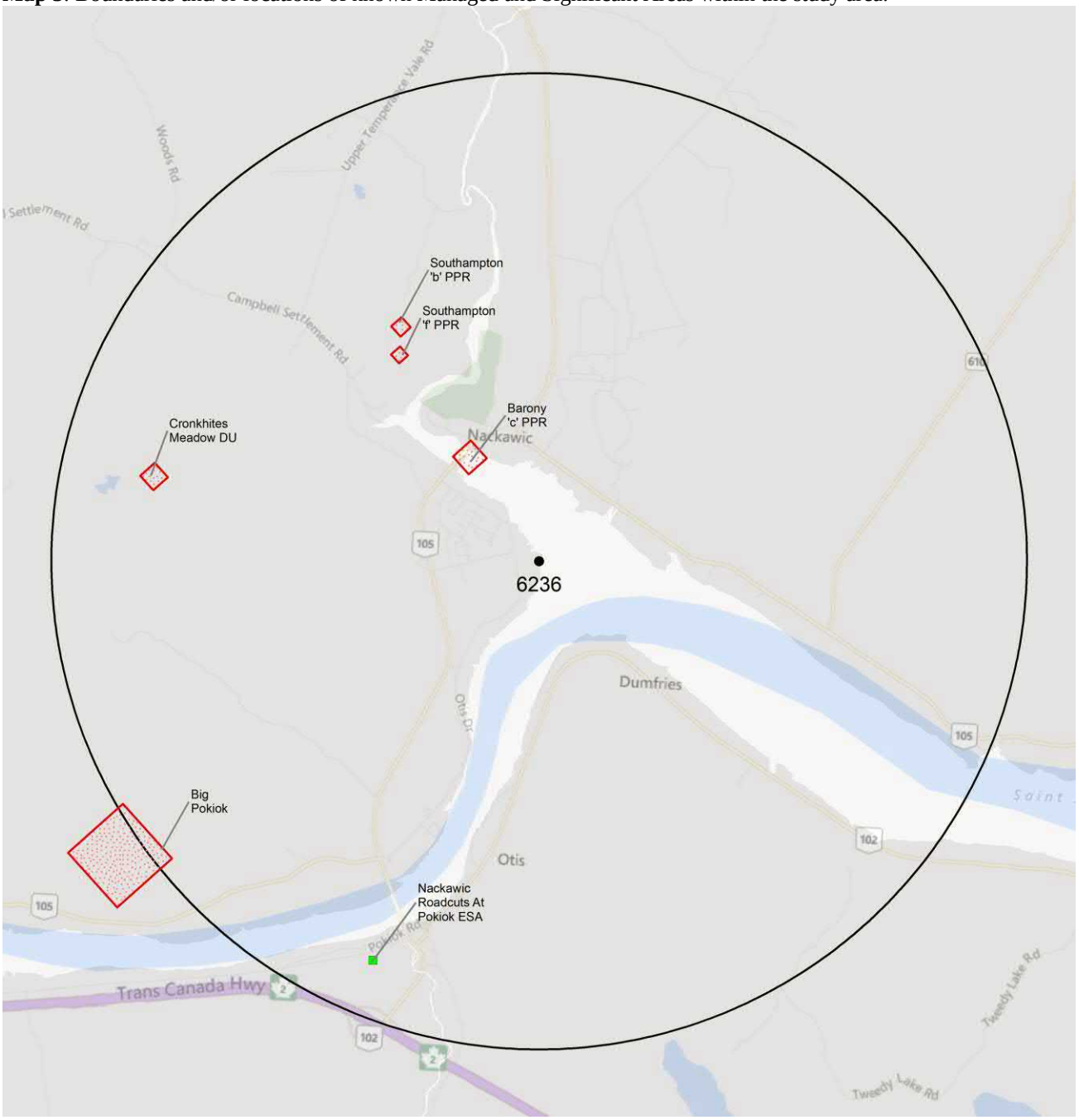


3.0 SPECIAL AREAS

3.1 MANAGED AREAS
The GIS scan identified 5 managed areas in the vicinity of the study area (Map 3 and attached file: *ma*.xls).

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

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



4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding "location-sensitive" species, section 4.3) within the study area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (± 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	*Solidago simplex var. racemosa*	Sticky Goldenrod				S2	2 May Be At Risk	1	1.8 ± 1.0
P	*Hedeoma pulegioides*	American False Pennyroyal				S2	4 Secure	1	1.8 ± 1.0
P	*Polygala senega*	Seneca Snakeroot				S2	3 Sensitive	2	1.5 ± 100.0
P	*Schizachyrium scoparium*	Little Bluestem				S2	3 Sensitive	1	2.3 ± 1.0
P	*Polygala sanguinea*	Blood Milkwort				S3	3 Sensitive	3	1.6 ± 1.0
P	*Pilea pumila*	Dwarf Clearweed				S3	4 Secure	1	4.9 ± 1.0
P	*Eleocharis intermedia*	Matted Spikerush				S3	4 Secure	1	4.2 ± 0.0
P	*Heteranthera dubia*	Water Stargrass				S3	4 Secure	2	1.3 ± 0.0

4.2 FAUNA

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	*Hirundo rustica*	Barn Swallow	Threatened	Threatened	Threatened	S2B,S2M	3 Sensitive	4	0.3 ± 0.0
A	*Riparia riparia*	Bank Swallow	Threatened	Threatened		S2S3B,S2S3M	3 Sensitive	3	1.9 ± 7.0
A	*Dolichonyx oryzivorus*	Bobolink	Threatened	Threatened	Threatened	S3B,S3M	3 Sensitive	1	1.9 ± 7.0
A	*Chordeiles minor*	Common Nighthawk	Special Concern	Threatened	Threatened	S3B,S4M	1 At Risk	1	1.9 ± 7.0
A	*Contopus virens*	Eastern Wood-Pewee	Special Concern	Special Concern	Special Concern	S4B,S4M	4 Secure	1	1.9 ± 7.0
A	*Desmognathus fuscus*	Northern Dusky Salamander	Not At Risk			S3	3 Sensitive	34	1.5 ± 1.0
A	*Puma concolor pop. 1*	Eastern Cougar	Data Deficient		Endangered	SNA	5 Undetermined	1	3.6 ± 1.0
A	*Progne subis*	Purple Martin				S1B,S1M	2 May Be At Risk	1	2.9 ± 1.0
A	*Troglodytes aedon*	House Wren				S1S2B,S1S2M	5 Undetermined	2	0.9 ± 7.0
A	*Chen caerulescens*	Snow Goose				S2M	4 Secure	1	1.5 ± 5.0
A	*Petrochelidon pyrrhonota*	Cliff Swallow				S2S3B,S2S3M	3 Sensitive	2	1.9 ± 7.0
A	*Cathartes aura*	Turkey Vulture				S3B,S3M	4 Secure	3	1.9 ± 7.0
A	*Rallus limicola*	Virginia Rail				S3B,S3M	3 Sensitive	1	1.9 ± 7.0
A	*Charadrius vociferus*	Killdeer				S3B,S3M	3 Sensitive	3	1.9 ± 7.0
A	*Vireo gilvus*	Warbling Vireo				S3B,S3M	4 Secure	2	0.3 ± 0.0
A	*Piranga olivacea*	Scarlet Tanager				S3B,S3M	4 Secure	5	1.9 ± 0.0
A	*Passerina cyanea*	Indigo Bunting				S3B,S3M	4 Secure	4	0.3 ± 0.0
A	*Icterus galbula*	Baltimore Oriole				S3B,S3M	4 Secure	3	1.9 ± 7.0
A	*Tyrannus tyrannus*	Eastern Kingbird				S3S4B,S3S4M	3 Sensitive	1	1.9 ± 7.0
A	*Actitis macularius*	Spotted Sandpiper				S3S4B,S5M	4 Secure	2	1.9 ± 7.0
A	*Gallinago delicata*	Wilson's Snipe				S3S4B,S5M	4 Secure	1	1.9 ± 7.0
A	*Larus delawarensis*	Ring-billed Gull				S3S4B,S5M	4 Secure	2	1.5 ± 5.0
I	*Boloria bellona*	Meadow Fritillary				S3	4 Secure	1	1.9 ± 7.0

4.3 LOCATION SENSITIVE SPECIES

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

New Brunswick

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

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

4.4 SOURCE BIBLIOGRAPHY

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

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5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 13033 records of 127 vertebrate and 1017 records of 69 invertebrate fauna; 9385 records of 345 vascular, 279 records of 91 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 (including "location-sensitive" species). 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 (± the precision, in km, of the record).

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	*Myotis lucifugus*	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	16	27.2 ± 100.0	NB
A	*Myotis septentrionalis*	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	5	45.2 ± 1.0	NB
A	*Salmo salar pop. 1*	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered	Endangered	S2	2 May Be At Risk	433	38.2 ± 50.0	NB
A	*Melanerpes erythrocephalus*	Red-headed Woodpecker	Endangered	Threatened		SNA	8 Accidental	3	44.0 ± 5.0	NB
A	*Rangifer tarandus pop. 2*	Woodland Caribou (Atlantic-Gasp├⌐sie pop.)	Endangered	Endangered	Extirpated	SX	0.1 Extirpated	2	39.1 ± 1.0	NB
A	*Sturnella magna*	Eastern Meadowlark	Threatened	Threatened	Threatened	S1B,S1M	2 May Be At Risk	31	28.1 ± 7.0	NB
A	*Ixobrychus exilis*	Least Bittern	Threatened	Threatened	Threatened	S1S2B,S1S2M	1 At Risk	17	38.1 ± 7.0	NB
A	*Hylocichla mustelina*	Wood Thrush	Threatened	Threatened	Threatened	S1S2B,S1S2M	2 May Be At Risk	204	8.9 ± 7.0	NB
A	*Caprimulgus vociferus*	Whip-Poor-Will	Threatened	Threatened	Threatened	S2B,S2M	1 At Risk	87	7.7 ± 7.0	NB
A	*Hirundo rustica*	Barn Swallow	Threatened	Threatened	Threatened	S2B,S2M	3 Sensitive	807	0.3 ± 0.0	NB
A	*Catharus bicknelli*	Bicknell's Thrush	Threatened	Special Concern	Threatened	S2B,S2M	1 At Risk	2	70.6 ± 7.0	NB
A	*Glyptemys insculpta*	Wood Turtle	Threatened	Threatened	Threatened	S2S3	1 At Risk	75	24.0 ± 1.0	NB
A	*Chaetura pelagica*	Chimney Swift	Threatened	Threatened	Threatened	S2S3B,S2M	1 At Risk	289	10.1 ± 7.0	NB
A	*Riparia riparia*	Bank Swallow	Threatened	Threatened		S2S3B,S2S3M	3 Sensitive	234	1.9 ± 7.0	NB
A	*Acipenser oxyrinchus*	Atlantic Sturgeon	Threatened		Threatened	S3	4 Secure	1	73.8 ± 1.0	NB
A	*Wilsonia canadensis*	Canada Warbler	Threatened	Threatened	Threatened	S3B,S3M	1 At Risk	1060	8.9 ± 0.0	NB
A	*Dolichonyx oryzivorus*	Bobolink	Threatened	Threatened	Threatened	S3B,S3M	3 Sensitive	616	1.9 ± 7.0	NB
A	*Anguilla rostrata*	American Eel	Threatened		Threatened	S4	4 Secure	25	25.6 ± 1.0	NB
A	*Osmerus mordax pop. 2*	Lake Utopia Smelt large-bodied pop.	Threatened		Threatened			2	97.2 ± 10.0	NB
A	*Coturnicops noveboracensis*	Yellow Rail	Special Concern	Special Concern	Special Concern	S1?B,SUM	2 May Be At Risk	3	76.5 ± 7.0	NB
A	*Histrionicus histrionicus pop. 1*	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S1B,S1S2N,S2M	1 At Risk	1	32.0 ± 0.0	NB
A	*Falco peregrinus pop. 1*	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Endangered	S1B,S3M	1 At Risk	29	34.5 ± 5.0	NB
A	*Asio flammeus*	Short-eared Owl	Special Concern	Special Concern	Special Concern	S2B,S2M	3 Sensitive	15	76.6 ± 7.0	NB
A	*Bucephala islandica (Eastern pop.)*	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern	Special Concern	S2M,S2N	3 Sensitive	28	26.1 ± 1.0	NB
A	*Acipenser brevirostrum*	Shortnose Sturgeon	Special Concern	Special Concern	Special Concern	S3	3 Sensitive	3	30.0 ± 10.0	NB
A	*Chelydra serpentina*	Snapping Turtle	Special Concern	Special Concern	Special Concern	S3	3 Sensitive	27	45.1 ± 1.0	NB
A	*Euphagus carolinus*	Rusty Blackbird	Special Concern	Special Concern	Special Concern	S3B,S3M	2 May Be At Risk	194	9.7 ± 0.0	NB
A	*Contopus cooperi*	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S3B,S3M	1 At Risk	568	8.1 ± 7.0	NB
A	*Coccothraustes vespertinus*	Evening Grosbeak	Special Concern			S3B,S3S4N,SUM	3 Sensitive	257	8.1 ± 7.0	NB
A	*Chordeiles minor*	Common Nighthawk	Special Concern	Threatened	Threatened	S3B,S4M	1 At Risk	360	1.9 ± 7.0	NB
A	*Phocoena phocoena (NW Atlantic pop.)*	Harbour Porpoise - Northwest Atlantic pop.	Special Concern	Threatened		S4		5	78.3 ± 100.0	NB
A	*Chrysemys picta picta*	Eastern Painted Turtle	Special Concern			S4	4 Secure	18	31.0 ± 1.0	NB
A	*Contopus virens*	Eastern Wood-Pewee	Special Concern	Special Concern	Special Concern	S4B,S4M	4 Secure	523	1.9 ± 7.0	NB
A	*Podiceps auritus*	Horned Grebe	Special Concern		Special Concern	S4N,S4M	4 Secure	7	33.0 ± 2.0	NB
A	*Bubo scandiacus*	Snowy Owl	Not At Risk			S1N,S2S3M	4 Secure	5	36.6 ± 1.0	NB
A	*Accipiter cooperii*	Cooper's Hawk	Not At Risk			S1S2B,S1S2M	2 May Be At Risk	13	28.1 ± 7.0	NB
A	*Fulica americana*	American Coot	Not At Risk			S1S2B,S1S2M	3 Sensitive	3	87.7 ± 7.0	NB
A	*Sorex dispar*	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	7	74.7 ± 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	*Buteo lineatus*	Red-shouldered Hawk	Not At Risk	Special Concern		S2B,S2M	2 May Be At Risk	43	8.9 ± 0.0	NB
A	*Chlidonias niger*	Black Tern	Not At Risk			S2B,S2M	3 Sensitive	129	45.8 ± 5.0	NB
A	*Lynx canadensis*	Canadian Lynx	Not At Risk		Endangered	S3	1 At Risk	25	8.5 ± 1.0	NB
A	*Desmognathus fuscus*	Northern Dusky Salamander	Not At Risk			S3	3 Sensitive	52	1.5 ± 1.0	NB
A	*Sterna hirundo*	Common Tern	Not At Risk			S3B,SUM	3 Sensitive	124	15.9 ± 0.0	NB
A	*Podiceps grisegena*	Red-necked Grebe	Not At Risk			S3M,S2N	3 Sensitive	8	31.6 ± 0.0	NB
A	*Haliaeetus leucocephalus*	Bald Eagle	Not At Risk		Endangered	S4	1 At Risk	508	1.3 ± 0.0	NB
A	*Canis lupus*	Gray Wolf	Not At Risk		Extirpated	SX	0.1 Extirpated	1	34.2 ± 1.0	NB
A	*Puma concolor pop. 1*	Eastern Cougar	Data Deficient		Endangered	SNA	5 Undetermined	52	3.6 ± 1.0	NB
A	*Morone saxatilis*	Striped Bass	E,E,SC			S3	2 May Be At Risk	8	25.6 ± 1.0	NB
A	*Salvelinus alpinus*	Arctic Char				S1	3 Sensitive	1	93.8 ± 1.0	NB
A	*Vireo flavifrons*	Yellow-throated Vireo				S1?B,S1?M	8 Accidental	6	48.1 ± 7.0	NB
A	*Tringa melanoleuca*	Greater Yellowlegs				S1?B,S5M	4 Secure	87	31.6 ± 0.0	NB
A	*Aythya americana*	Redhead				S1B,S1M	8 Accidental	1	96.8 ± 7.0	NB
A	*Gallinula chloropus*	Common Moorhen				S1B,S1M	3 Sensitive	10	43.0 ± 1.0	NB
A	*Grus canadensis*	Sandhill Crane				S1B,S1M	8 Accidental	5	45.3 ± 0.0	NB
A	*Bartramia longicauda*	Upland Sandpiper				S1B,S1M	3 Sensitive	15	59.0 ± 7.0	NB
A	*Phalaropus tricolor*	Wilson's Phalarope				S1B,S1M	3 Sensitive	11	49.1 ± 7.0	NB
A	*Leucophaeus atricilla*	Laughing Gull				S1B,S1M	3 Sensitive	2	46.7 ± 1.0	NB
A	*Progne subis*	Purple Martin				S1B,S1M	2 May Be At Risk	228	2.9 ± 1.0	NB
A	*Thryothorus ludovicianus*	Carolina Wren				S1B,S1M	8 Accidental	36	32.5 ± 0.0	NB
A	*Oxyura jamaicensis*	Ruddy Duck				S1B,S2S3M	4 Secure	4	40.7 ± 0.0	NB
A	*Aythya affinis*	Lesser Scaup				S1B,S4M	4 Secure	53	33.0 ± 5.0	NB
A	*Aythya marila*	Greater Scaup				S1B,S4M,S2N	4 Secure	8	68.8 ± 7.0	NB
A	*Eremophila alpestris*	Horned Lark				S1B,S4N,S5M	2 May Be At Risk	17	7.7 ± 7.0	NB
A	*Branta bernicla*	Brant				S1N, S2S3M	4 Secure	5	61.4 ± 0.0	NB
A	*Chroicocephalus ridibundus*	Black-headed Gull				S1N,S2M	3 Sensitive	1	46.7 ± 1.0	NB
A	*Butorides virescens*	Green Heron				S1S2B,S1S2M	3 Sensitive	20	22.0 ± 7.0	NB
A	*Nycticorax nycticorax*	Black-crowned Night-heron				S1S2B,S1S2M	3 Sensitive	2	31.5 ± 1.0	NB
A	*Empidonax traillii*	Willow Flycatcher				S1S2B,S1S2M	3 Sensitive	56	27.3 ± 0.0	NB
A	*Stelgidopteryx serripennis*	Northern Rough-winged Swallow				S1S2B,S1S2M	2 May Be At Risk	21	7.7 ± 7.0	NB
A	*Troglodytes aedon*	House Wren				S1S2B,S1S2M	5 Undetermined	18	0.9 ± 7.0	NB
A	*Rissa tridactyla*	Black-legged Kittiwake				S1S2B,S4N,S5M	4 Secure	1	46.7 ± 1.0	NB
A	*Microtus chrotorrhinus*	Rock Vole				S2?	5 Undetermined	10	90.2 ± 1.0	NB
A	*Cistothorus palustris*	Marsh Wren				S2B,S2M	3 Sensitive	47	15.6 ± 7.0	NB
A	*Mimus polyglottos*	Northern Mockingbird				S2B,S2M	3 Sensitive	77	19.9 ± 7.0	NB
A	*Toxostoma rufum*	Brown Thrasher				S2B,S2M	3 Sensitive	76	6.9 ± 0.0	NB
A	*Pooecetes gramineus*	Vesper Sparrow				S2B,S2M	2 May Be At Risk	60	34.1 ± 7.0	NB
A	*Anas strepera*	Gadwall				S2B,S3M	4 Secure	14	33.6 ± 0.0	NB
A	*Pinicola enucleator*	Pine Grosbeak				S2B,S4S5N,S4S5M	3 Sensitive	71	17.7 ± 7.0	NB
A	*Tringa solitaria*	Solitary Sandpiper				S2B,S5M	4 Secure	75	8.3 ± 0.0	NB
A	*Oceanodroma leucorhoa*	Leach's Storm-Petrel				S2B,SUM	3 Sensitive	1	46.7 ± 1.0	NB
A	*Chen caerulescens*	Snow Goose				S2M	4 Secure	5	1.5 ± 5.0	NB
A	*Phalacrocorax carbo*	Great Cormorant				S2N,S2M	4 Secure	2	28.8 ± 0.0	NB
A	*Larus hyperboreus*	Glaucous Gull				S2N,S2M	4 Secure	19	38.8 ± 50.0	NB
A	*Asio otus*	Long-eared Owl				S2S3	5 Undetermined	12	35.2 ± 0.0	NB
A	*Picoides dorsalis*	American Three-toed Woodpecker				S2S3	3 Sensitive	24	20.0 ± 7.0	NB
A	*Salmo salar*	Atlantic Salmon				S2S3	2 May Be At Risk	201	25.6 ± 1.0	NB
A	*Anas clypeata*	Northern Shoveler				S2S3B,S2S3M	4 Secure	43	30.6 ± 0.0	NB
A	*Myiarchus crinitus*	Great Crested Flycatcher				S2S3B,S2S3M	3 Sensitive	250	8.1 ± 7.0	NB
A	*Petrochelidon pyrrhonota*	Cliff Swallow				S2S3B,S2S3M	3 Sensitive	391	1.9 ± 7.0	NB
A	*Pluvialis dominica*	American Golden-Plover				S2S3M	3 Sensitive	2	49.1 ± 0.0	NB
A	*Calcarius lapponicus*	Lapland Longspur				S2S3N,SUM	3 Sensitive	2	45.9 ± 2.0	NB
A	*Cepphus grylle*	Black Guillemot				S3	4 Secure	4	91.8 ± 7.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	*Loxia curvirostra*	Red Crossbill				S3	4 Secure	103	7.7 ± 7.0	NB
A	*Carduelis pinus*	Pine Siskin				S3	4 Secure	167	10.1 ± 7.0	NB
A	*Prosopium cylindraceum*	Round Whitefish				S3	4 Secure	4	51.2 ± 10.0	NB
A	*Salvelinus namaycush*	Lake Trout				S3	3 Sensitive	6	24.5 ± 0.0	NB
A	*Sorex maritimensis*	Maritime Shrew				S3	4 Secure	1	19.9 ± 1.0	NB
A	*Eptesicus fuscus*	Big Brown Bat				S3	3 Sensitive	35	28.7 ± 1.0	NB
A	*Cathartes aura*	Turkey Vulture				S3B,S3M	4 Secure	178	1.9 ± 7.0	NB
A	*Rallus limicola*	Virginia Rail				S3B,S3M	3 Sensitive	79	1.9 ± 7.0	NB
A	*Charadrius vociferus*	Killdeer				S3B,S3M	3 Sensitive	398	1.9 ± 7.0	NB
A	*Tringa semipalmata*	Willet				S3B,S3M	3 Sensitive	4	56.2 ± 0.0	NB
A	*Coccyzus erythropthalmus*	Black-billed Cuckoo				S3B,S3M	4 Secure	155	11.9 ± 7.0	NB
A	*Vireo gilvus*	Warbling Vireo				S3B,S3M	4 Secure	231	0.3 ± 0.0	NB
A	*Piranga olivacea*	Scarlet Tanager				S3B,S3M	4 Secure	299	1.9 ± 0.0	NB
A	*Passerina cyanea*	Indigo Bunting				S3B,S3M	4 Secure	120	0.3 ± 0.0	NB
A	*Molothrus ater*	Brown-headed Cowbird				S3B,S3M	2 May Be At Risk	212	8.1 ± 7.0	NB
A	*Icterus galbula*	Baltimore Oriole				S3B,S3M	4 Secure	181	1.9 ± 7.0	NB
A	*Somateria mollissima*	Common Eider				S3B,S4M,S3N	4 Secure	50	38.8 ± 199.0	NB
A	*Dendroica tigrina*	Cape May Warbler				S3B,S4S5M	4 Secure	122	10.0 ± 0.0	NB
A	*Anas acuta*	Northern Pintail				S3B,S5M	3 Sensitive	34	37.7 ± 1.0	NB
A	*Mergus serrator*	Red-breasted Merganser				S3B,S5M,S4S5N	4 Secure	30	25.2 ± 1.0	NB
A	*Arenaria interpres*	Ruddy Turnstone				S3M	4 Secure	2	90.2 ± 0.0	NB
A	*Melanitta nigra*	Black Scoter				S3M,S1S2N	3 Sensitive	28	8.9 ± 2.0	NB
A	*Bucephala albeola*	Bufflehead				S3M,S2N	3 Sensitive	64	28.8 ± 0.0	NB
A	*Calidris maritima*	Purple Sandpiper				S3M,S3N	4 Secure	2	96.1 ± 9.0	NB
A	*Synaptomys cooperi*	Southern Bog Lemming				S3S4	4 Secure	12	43.1 ± 1.0	NB
A	*Tyrannus tyrannus*	Eastern Kingbird				S3S4B,S3S4M	3 Sensitive	481	1.9 ± 7.0	NB
A	*Actitis macularius*	Spotted Sandpiper				S3S4B,S5M	4 Secure	402	1.9 ± 7.0	NB
A	*Gallinago delicata*	Wilson's Snipe				S3S4B,S5M	4 Secure	555	1.9 ± 7.0	NB
A	*Larus delawarensis*	Ring-billed Gull				S3S4B,S5M	4 Secure	89	1.5 ± 5.0	NB
A	*Dendroica striata*	Blackpoll Warbler				S3S4B,S5M	4 Secure	31	29.9 ± 7.0	NB
A	*Pluvialis squatarola*	Black-bellied Plover				S3S4M	4 Secure	10	56.2 ± 0.0	NB
A	*Calidris pusilla*	Semipalmated Sandpiper				S3S4M	4 Secure	10	30.8 ± 12.0	NB
A	*Calidris melanotos*	Pectoral Sandpiper				S3S4M	4 Secure	9	30.6 ± 0.0	NB
A	*Calidris alba*	Sanderling				S3S4M,S1N	3 Sensitive	7	47.1 ± 0.0	NB
A	*Morus bassanus*	Northern Gannet				SHB,S5M	4 Secure	3	31.8 ± 0.0	NB
C	*Quercus macrocarpa - Acer rubrum / Onoclea sensibilis - Carex arcta Forest*	Bur Oak - Red Maple / Sensitive Fern - Northern Clustered Sedge Forest				S2		1	82.6 ± 0.0	NB
C	*Acer saccharinum / Onoclea sensibilis - Lysimachia terrestris Forest*	Silver Maple / Sensitive Fern - Swamp Yellow Loosestrife Forest				S3		1	61.9 ± 0.0	NB
C	*Acer saccharum - Fraxinus americana / Gymnocarpium dryopteris - Deparia acrostichoides Forest*	Sugar Maple - White Ash / Common Oak Fern - Silvery Glade Fern Forest				S3		2	55.9 ± 0.0	NB
I	*Cicindela marginipennis*	Cobblestone Tiger Beetle	Endangered	Endangered	Endangered	S1	1 At Risk	48	38.4 ± 0.0	NB
I	*Gomphus ventricosus*	Skillet Clubtail	Endangered		Endangered	S1S2	2 May Be At Risk	48	43.9 ± 1.0	NB
I	*Danaus plexippus*	Monarch	Endangered	Special Concern	Special Concern	S3B,S3M	3 Sensitive	53	28.8 ± 0.0	NB
I	*Ophiogomphus howei*	Pygmy Snaketail	Special Concern	Special Concern	Special Concern	S2	2 May Be At Risk	17	38.0 ± 0.0	NB
I	*Alasmidonta varicosa*	Brook Floater	Special Concern		Special Concern	S2	3 Sensitive	1	38.0 ± 0.0	NB
I	*Lampsilis cariosa*	Yellow Lampmussel	Special Concern	Special Concern	Special Concern	S2	3 Sensitive	80	25.9 ± 1.0	NB
I	*Bombus terricola*	Yellow-banded Bumblebee	Special Concern			S3?	3 Sensitive	31	19.0 ± 0.0	NB
I	*Haematopota rara*	Shy Cleg				S1	5 Undetermined	1	43.1 ± 1.0	NB
I	*Lycaena dorcas*	Dorcas Copper				S1	2 May Be At Risk	17	32.8 ± 0.0	NB
I	*Erora laeta*	Early Hairstreak				S1	2 May Be At Risk	5	20.6 ± 7.0	NB
I	*Somatochlora septentrionalis*	Muskeg Emerald				S1	2 May Be At Risk	1	14.0 ± 1.0	NB
I	*Arigomphus furcifer*	Lilypad Clubtail				S1	5 Undetermined	8	63.5 ± 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	*Polites origenes*	Crossline Skipper				S1?	5 Undetermined	5	36.2 ± 0.0	NB
I	*Plebejus saepiolus*	Greenish Blue				S1S2	4 Secure	3	44.2 ± 1.0	NB
I	*Ophiogomphus colubrinus*	Boreal Snaketail				S1S2	2 May Be At Risk	35	38.0 ± 0.0	NB
I	*Cicindela ancocisconensis*	Appalachian Tiger Beetle				S2	5 Undetermined	2	43.1 ± 0.0	NB
I	*Encyclops caerulea*	a Longhorned Beetle				S2		1	45.5 ± 0.0	NB
I	*Brachyleptura circumdata*	a Longhorned Beetle				S2		6	63.2 ± 0.0	NB
I	*Satyrium calanus falacer*	Banded Hairstreak				S2	4 Secure	21	20.2 ± 7.0	NB
I	*Strymon melinus*	Grey Hairstreak				S2	4 Secure	1	60.7 ± 1.0	NB
I	*Aeshna clepsydra*	Mottled Darner				S2	3 Sensitive	5	29.6 ± 0.0	NB
I	*Somatochlora tenebrosa*	Clamp-Tipped Emerald				S2	5 Undetermined	5	26.9 ± 0.0	NB
I	*Ladona exusta*	White Corporal				S2	5 Undetermined	9	13.5 ± 0.0	NB
I	*Hetaerina americana*	American Rubyspot				S2	3 Sensitive	15	21.7 ± 0.0	NB
I	*Coenagrion interrogatum*	Subarctic Bluet				S2	3 Sensitive	2	32.5 ± 0.0	NB
I	*Ischnura posita*	Fragile Forktail				S2	2 May Be At Risk	9	29.7 ± 0.0	NB
I	*Callophrys henrici*	Henry's Elfin				S2S3	4 Secure	13	36.1 ± 0.0	NB
I	*Sphaeroderus nitidicollis*	a Ground Beetle				S3	4 Secure	1	75.2 ± 0.0	NB
I	*Orthosoma brunneum*	a Longhorned Beetle				S3		1	84.6 ± 5.0	NB
I	*Elaphrus americanus*	a Ground Beetle				S3	4 Secure	1	63.5 ± 0.0	NB
I	*Agonum excavatum*	a Ground Beetle				S3	4 Secure	1	63.5 ± 0.0	NB
I	*Clivina americana*	a Ground Beetle				S3	4 Secure	1	63.5 ± 0.0	NB
I	*Olisthopus parmatus*	a Ground Beetle				S3	4 Secure	1	75.2 ± 0.0	NB
I	*Paratachys scitulus*	a Ground Beetle				S3	5 Undetermined	1	63.5 ± 0.0	NB
I	*Stenocorus vittigera*	a Longhorned Beetle				S3		1	63.5 ± 0.0	NB
I	*Badister neopulchellus*	a Ground Beetle				S3	4 Secure	1	63.5 ± 0.0	NB
I	*Hesperia sassacus*	Indian Skipper				S3	4 Secure	11	38.1 ± 7.0	NB
I	*Euphyes bimacula*	Two-spotted Skipper				S3	4 Secure	13	16.2 ± 0.0	NB
I	*Lycaena hyllus*	Bronze Copper				S3	3 Sensitive	6	31.3 ± 0.0	NB
I	*Satyrium acadica*	Acadian Hairstreak				S3	4 Secure	11	52.8 ± 0.0	NB
I	*Callophrys polios*	Hoary Elfin				S3	4 Secure	10	34.5 ± 7.0	NB
I	*Callophrys eryphon*	Western Pine Elfin				S3	4 Secure	1	91.1 ± 7.0	NB
I	*Speyeria aphrodite*	Aphrodite Fritillary				S3	4 Secure	21	24.1 ± 7.0	NB
I	*Boloria eunomia*	Bog Fritillary				S3	5 Undetermined	2	62.4 ± 0.0	NB
I	*Boloria bellona*	Meadow Fritillary				S3	4 Secure	52	1.9 ± 7.0	NB
I	*Polygonia satyrus*	Satyr Comma				S3	4 Secure	20	35.0 ± 7.0	NB
I	*Polygonia gracilis*	Hoary Comma				S3	4 Secure	12	35.0 ± 7.0	NB
I	*Nymphalis l-album*	Compton Tortoiseshell				S3	4 Secure	7	21.1 ± 1.0	NB
I	*Gomphus vastus*	Cobra Clubtail				S3	3 Sensitive	57	12.4 ± 0.0	NB
I	*Gomphus abbreviatus*	Spine-crowned Clubtail				S3	4 Secure	42	9.6 ± 0.0	NB
I	*Gomphaeschna furcillata*	Harlequin Darner				S3	5 Undetermined	11	17.8 ± 0.0	NB
I	*Dorocordulia lepida*	Petite Emerald				S3	4 Secure	18	19.9 ± 1.0	NB
I	*Somatochlora albicincta*	Ringed Emerald				S3	4 Secure	2	62.0 ± 1.0	NB
I	*Somatochlora cingulata*	Lake Emerald				S3	4 Secure	10	8.6 ± 0.0	NB
I	*Somatochlora forcipata*	Forcipate Emerald				S3	4 Secure	18	17.6 ± 0.0	NB
I	*Williamsonia fletcheri*	Ebony Boghaunter				S3	4 Secure	16	17.1 ± 0.0	NB
I	*Lestes eurinus*	Amber-Winged Spreadwing				S3	4 Secure	8	22.7 ± 1.0	NB
I	*Lestes vigilax*	Swamp Spreadwing				S3	3 Sensitive	24	22.7 ± 1.0	NB
I	*Enallagma geminatum*	Skimming Bluet				S3	5 Undetermined	14	18.9 ± 0.0	NB
I	*Enallagma signatum*	Orange Bluet				S3	4 Secure	24	14.5 ± 0.0	NB
I	*Stylurus scudderi*	Zebra Clubtail				S3	4 Secure	67	31.3 ± 0.0	NB
I	*Alasmidonta undulata*	Triangle Floater				S3	3 Sensitive	15	28.1 ± 0.0	NB
I	*Leptodea ochracea*	Tidewater Mucket				S3	4 Secure	53	11.5 ± 1.0	NB
I	*Striatura ferrea*	Black Striate				S3		1	44.4 ± 1.0	NB
I	*Neohelix albolabris*	Whitelip				S3		1	44.4 ± 1.0	NB
I	*Spurwinkia salsa*	Saltmarsh Hydrobe				S3		2	64.1 ± 0.0	NB
I	*Pantala hymenaea*	Spot-Winged Glider				S3B,S3M	4 Secure	2	42.3 ± 0.0	NB
I	*Satyrium liparops strigosum*	Striped Hairstreak				S3S4	4 Secure	8	38.1 ± 7.0	NB
I	*Cupido comyntas*	Eastern Tailed Blue				S3S4	4 Secure	7	15.0 ± 0.0	NB

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N	*Pseudevernia cladonia*	Ghost Antler Lichen	Not At Risk			S2S3	5 Undetermined	4	90.3 ± 0.0	NB
N	*Aphanorrhegma serratum*	a Moss				S1	5 Undetermined	1	61.9 ± 0.0	NB
N	*Grimmia unicolor*	a Moss				S1	2 May Be At Risk	1	99.8 ± 1.0	NB
N	*Sphagnum macrophyllum*	Sphagnum				S1	2 May Be At Risk	1	89.0 ± 0.0	NB
N	*Atrichum angustatum*	Lesser Smoothcap Moss				S1?	2 May Be At Risk	1	32.3 ± 2.0	NB
N	*Cinclidium stygium*	Sooty Cupola Moss				S1?	2 May Be At Risk	2	94.9 ± 0.0	NB
N	*Dichelyma falcatum*	a Moss				S1?	2 May Be At Risk	2	45.2 ± 10.0	NB
N	*Dicranum bonjeanii*	Bonjean's Broom Moss				S1?	2 May Be At Risk	1	45.4 ± 1.0	NB
N	*Entodon brevisetus*	a Moss				S1?	2 May Be At Risk	1	69.5 ± 1.0	NB
N	*Eurhynchium hians*	Light Beaked Moss				S1?	2 May Be At Risk	1	45.3 ± 1.0	NB
N	*Paludella squarrosa*	Tufted Fen Moss				S1?	2 May Be At Risk	1	95.3 ± 0.0	NB
N	*Racomitrium ericoides*	a Moss				S1?	2 May Be At Risk	1	39.8 ± 3.0	NB
N	*Splachnum pennsylvanicum*	Southern Dung Moss				S1?	2 May Be At Risk	2	15.2 ± 0.0	NB
N	*Platylomella lescurii*	a Moss				S1?	5 Undetermined	1	79.9 ± 1.0	NB
N	*Reboulia hemisphaerica*	Purple-margined Liverwort				S1S2	6 Not Assessed	1	96.1 ± 1.0	NB
N	*Brachythecium acuminatum*	Acuminate Ragged Moss				S1S2	5 Undetermined	2	45.3 ± 10.0	NB
N	*Calliergon richardsonii*	Richardson's Spear Moss				S1S2	2 May Be At Risk	1	95.2 ± 0.0	NB
N	*Campylium radicale*	Long-stalked Fine Wet Moss				S1S2	5 Undetermined	1	45.3 ± 1.0	NB
N	*Ditrichum pallidum*	Pale Cow-hair Moss				S1S2	2 May Be At Risk	3	22.3 ± 1.0	NB
N	*Drummondia prorepens*	a Moss				S1S2	2 May Be At Risk	1	45.2 ± 1.0	NB
N	*Fissidens taxifolius*	Yew-leaved Pocket Moss				S1S2	2 May Be At Risk	4	32.2 ± 0.0	NB
N	*Seligeria brevifolia*	a Moss				S1S2	3 Sensitive	1	35.4 ± 1.0	NB
N	*Sphagnum platyphyllum*	Flat-leaved Peat Moss				S1S2	5 Undetermined	3	21.8 ± 1.0	NB
N	*Pseudotaxiphyllum distichaceum*	a Moss				S1S2	2 May Be At Risk	1	44.2 ± 1.0	NB
N	*Hamatocaulis vernicosus*	a Moss				S1S2	2 May Be At Risk	2	94.9 ± 0.0	NB
N	*Bryohaplocladium microphyllum*	Tiny-leaved Haplocladium Moss				S1S2	2 May Be At Risk	1	75.8 ± 1.0	NB
N	*Porella pinnata*	Pinnate Scalewort				S1S3	6 Not Assessed	1	59.2 ± 1.0	NB
N	*Amphidium mougeotii*	a Moss				S2	3 Sensitive	1	91.0 ± 8.0	NB
N	*Cirriphyllum piliferum*	Hair-pointed Moss				S2	3 Sensitive	1	36.3 ± 1.0	NB
N	*Cynodontium strumiferum*	Strumose Dogtooth Moss				S2	3 Sensitive	1	91.0 ± 8.0	NB
N	*Didymodon ferrugineus*	a moss				S2	3 Sensitive	2	34.6 ± 0.0	NB
N	*Anomodon tristis*	a Moss				S2	2 May Be At Risk	1	43.5 ± 1.0	NB
N	*Hypnum pratense*	Meadow Plait Moss				S2	3 Sensitive	2	50.4 ± 1.0	NB
N	*Isopterygiopsis pulchella*	Neat Silk Moss				S2	3 Sensitive	1	49.9 ± 1.0	NB
N	*Meesia triquetra*	Three-ranked Cold Moss				S2	2 May Be At Risk	1	30.9 ± 0.0	NB
N	*Physcomitrium immersum*	a Moss				S2	3 Sensitive	5	45.3 ± 1.0	NB
N	*Sphagnum centrale*	Central Peat Moss				S2	3 Sensitive	2	74.1 ± 0.0	NB
N	*Anomobryum filiforme*	a moss				S2	5 Undetermined	1	45.3 ± 1.0	NB
N	*Fuscopannaria leucosticta*	Rimmed Shingles Lichen				S2	2 May Be At Risk	67	13.5 ± 0.0	NB
N	*Leptogium corticola*	Blistered Jellyskin Lichen				S2	2 May Be At Risk	1	75.8 ± 0.0	NB
N	*Anomodon minor*	Blunt-leaved Anomodon Moss				S2?	2 May Be At Risk	1	44.9 ± 1.0	NB
N	*Brachythecium digastrum*	a Moss				S2?	3 Sensitive	2	45.3 ± 1.0	NB
N	*Bryum pallescens*	Pale Bryum Moss				S2?	5 Undetermined	1	73.4 ± 1.0	NB
N	*Dichelyma capillaceum*	Hairlike Dichelyma Moss				S2?	3 Sensitive	1	23.5 ± 4.0	NB
N	*Dicranum spurium*	Spurred Broom Moss				S2?	3 Sensitive	1	94.8 ± 0.0	NB
N	*Schistostega pennata*	Luminous Moss				S2?	3 Sensitive	2	45.3 ± 1.0	NB
N	*Seligeria campylopoda*	a Moss				S2?	3 Sensitive	1	34.6 ± 0.0	NB
N	*Seligeria diversifolia*	a Moss				S2?	3 Sensitive	1	89.4 ± 0.0	NB
N	*Sphagnum angermanicum*	a Peatmoss				S2?	3 Sensitive	1	83.2 ± 1.0	NB
N	*Plagiomnium rostratum*	Long-beaked Leafy Moss				S2?	3 Sensitive	1	79.7 ± 1.0	NB
N	*Buxbaumia aphylla*	Brown Shield Moss				S2S3	3 Sensitive	2	82.3 ± 15.0	NB
N	*Calliergonella cuspidata*	Common Large Wetland Moss				S2S3	3 Sensitive	2	74.0 ± 0.0	NB
N	*Campylium polygamum*	a Moss				S2S3	3 Sensitive	1	44.4 ± 1.0	NB

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N	*Didymodon rigidulus*	Rigid Screw Moss				S2S3	3 Sensitive	1	26.7 ± 8.0	NB
N	*Fissidens bushii*	Bush's Pocket Moss				S2S3	3 Sensitive	4	34.7 ± 1.0	NB
N	*Orthotrichum speciosum*	Showy Bristle Moss				S2S3	5 Undetermined	5	19.6 ± 3.0	NB
N	*Racomitrium fasciculare*	a Moss				S2S3	3 Sensitive	1	92.9 ± 0.0	NB
N	*Scorpidium scorpioides*	Hooked Scorpion Moss				S2S3	3 Sensitive	4	50.9 ± 1.0	NB
N	*Sphagnum subfulvum*	a Peatmoss				S2S3	2 May Be At Risk	1	76.9 ± 0.0	NB
N	*Taxiphyllum deplanatum*	Imbricate Yew-leaved Moss				S2S3	3 Sensitive	1	34.5 ± 0.0	NB
N	*Zygodon viridissimus*	a Moss				S2S3	2 May Be At Risk	1	86.1 ± 5.0	NB
N	*Schistidium agassizii*	Elf Bloom Moss				S2S3	3 Sensitive	2	86.1 ± 5.0	NB
N	*Dendriscocaulon umhausense*	a lichen				S2S3	3 Sensitive	2	67.1 ± 0.0	NB
N	*Hypnum curvifolium*	Curved-leaved Plait Moss				S3	3 Sensitive	1	86.1 ± 5.0	NB
N	*Peltigera membranacea*	Membranous Pelt Lichen				S3	5 Undetermined	4	55.3 ± 0.0	NB
N	*Aulacomnium androgynum*	Little Groove Moss				S3?	4 Secure	2	83.3 ± 1.0	NB
N	*Dicranella rufescens*	Red Forklet Moss				S3?	5 Undetermined	2	17.6 ± 4.0	NB
N	*Sphagnum lescurii*	a Peatmoss				S3?	5 Undetermined	1	74.4 ± 1.0	NB
N	*Anomodon rugelii*	Rugel's Anomodon Moss				S3S4	3 Sensitive	8	50.4 ± 0.0	NB
N	*Barbula convoluta*	Lesser Bird's-claw Beard Moss				S3S4	4 Secure	1	26.7 ± 8.0	NB
N	*Brachythecium velutinum*	Velvet Ragged Moss				S3S4	4 Secure	5	17.6 ± 4.0	NB
N	*Dicranella varia*	a Moss				S3S4	4 Secure	3	80.5 ± 2.0	NB
N	*Dicranum majus*	Greater Broom Moss				S3S4	4 Secure	1	82.3 ± 15.0	NB
N	*Fissidens bryoides*	Lesser Pocket Moss				S3S4	4 Secure	2	21.1 ± 4.0	NB
N	*Helodium blandowii*	Wetland-plume Moss				S3S4	4 Secure	2	49.9 ± 1.0	NB
N	*Heterocladium dimorphum*	Dimorphous Tangle Moss				S3S4	4 Secure	1	89.0 ± 2.0	NB
N	*Isopterygiopsis muelleriana*	a Moss				S3S4	4 Secure	6	17.5 ± 3.0	NB
N	*Myurella julacea*	Small Mouse-tail Moss				S3S4	4 Secure	1	91.0 ± 8.0	NB
N	*Physcomitrium pyriforme*	Pear-shaped Urn Moss				S3S4	3 Sensitive	5	33.9 ± 1.0	NB
N	*Sphagnum torreyanum*	a Peatmoss				S3S4	4 Secure	1	74.6 ± 1.0	NB
N	*Tomentypnum nitens*	Golden Fuzzy Fen Moss				S3S4	4 Secure	4	31.6 ± 3.0	NB
N	*Trichostomum tenuirostre*	Acid-Soil Moss				S3S4	4 Secure	3	34.5 ± 0.0	NB
N	*Limprichtia revolvens*	a Moss				S3S4	4 Secure	4	36.1 ± 0.0	NB
N	*Rauiella scita*	Smaller Fern Moss				S3S4	3 Sensitive	5	37.7 ± 3.0	NB
N	*Pannaria rubiginosa*	Brown-eyed Shingle Lichen				S3S4	3 Sensitive	1	67.1 ± 0.0	NB
N	*Protopannaria pezizoides*	Brown-gray Moss-shingle Lichen				S3S4	4 Secure	1	75.5 ± 0.0	NB
N	*Pseudocyphellaria perpetua*	Gilded Specklebelly Lichen				S3S4	3 Sensitive	38	66.3 ± 0.0	NB
N	*Pannaria conoplea*	Mealy-rimmed Shingle Lichen				S3S4	3 Sensitive	5	75.8 ± 0.0	NB
N	*Anaptychia palmulata*	Shaggy Fringed Lichen				S3S4	3 Sensitive	2	67.1 ± 0.0	NB
N	*Leucodon brachypus*	a Moss				SH	2 May Be At Risk	2	41.6 ± 10.0	NB
N	*Orthotrichum gymnostomum*	a Moss				SH	2 May Be At Risk	1	42.7 ± 10.0	NB
P	*Juglans cinerea*	Butternut	Endangered	Endangered	Endangered	S1	1 At Risk	447	6.1 ± 10.0	NB
P	*Pedicularis furbishiae*	Furbish Lousewort	Endangered	Endangered	Endangered	S1	1 At Risk	9	89.2 ± 1.0	NB
P	*Polemonium vanbruntiae*	Van Brunt's Jacob's-ladder	Threatened	Threatened	Threatened	S1	1 At Risk	6	97.2 ± 1.0	NB
P	*Symphyotrichum anticostense*	Anticosti Aster	Threatened	Threatened	Endangered	S2S3	1 At Risk	59	29.4 ± 0.0	NB
P	*Isoetes prototypus*	Prototype Quillwort	Special Concern	Special Concern	Endangered	S2	1 At Risk	22	33.2 ± 0.0	NB
P	*Pterospora andromedea*	Woodland Pinedrops			Endangered	S1	1 At Risk	24	20.5 ± 0.0	NB
P	*Cryptotaenia canadensis*	Canada Honewort				S1	2 May Be At Risk	6	28.0 ± 1.0	NB
P	*Sanicula trifoliata*	Large-Fruited Sanicle				S1	2 May Be At Risk	20	20.9 ± 0.0	NB
P	*Antennaria parlinii*	a Pussytoes				S1	2 May Be At Risk	7	67.9 ± 0.0	NB
P	*Bidens discoidea*	Swamp Beggarticks				S1	2 May Be At Risk	3	74.2 ± 0.0	NB
P	*Pseudognaphalium obtusifolium*	Eastern Cudweed				S1	2 May Be At Risk	2	95.2 ± 0.0	NB
P	*Helianthus decapetalus*	Ten-rayed Sunflower				S1	2 May Be At Risk	20	20.9 ± 0.0	NB
P	*Hieracium kalmii*	Kalm's Hawkweed				S1	2 May Be At Risk	2	37.0 ± 0.0	NB

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P	*Hieracium kalmii var. kalmii*	Kalm's Hawkweed				S1	2 May Be At Risk	2	37.7 ± 1.0	NB
P	*Hieracium paniculatum*	Panicled Hawkweed				S1	2 May Be At Risk	2	37.0 ± 1.0	NB
P	*Hieracium robinsonii*	Robinson's Hawkweed				S1	3 Sensitive	1	73.3 ± 0.0	NB
P	*Symphyotrichum laeve*	Smooth Aster				S1	5 Undetermined	6	19.7 ± 1.0	NB
P	*Canadanthus modestus*	Great Northern Aster				S1	2 May Be At Risk	12	47.2 ± 0.0	NB
P	*Cynoglossum virginianum*	Wild Comfrey				S1	2 May Be At Risk	1	99.7 ± 1.0	NB
P	*Cynoglossum virginianum var. boreale*	Wild Comfrey				S1	2 May Be At Risk	15	38.2 ± 0.0	NB
P	*Cardamine concatenata*	Cut-leaved Toothwort				S1	2 May Be At Risk	15	25.7 ± 1.0	NB
P	*Draba breweri var. cana*	Brewer's Whitlow-grass				S1	2 May Be At Risk	10	41.7 ± 0.0	NB
P	*Draba glabella*	Rock Whitlow-Grass				S1	2 May Be At Risk	2	70.1 ± 1.0	NB
P	*Chenopodium capitatum*	Strawberry-blite				S1	2 May Be At Risk	5	33.5 ± 0.0	NB
P	*Chenopodium simplex*	Maple-leaved Goosefoot				S1	2 May Be At Risk	7	24.5 ± 1.0	NB
P	*Callitriche terrestris*	Terrestrial Water-Starwort				S1	5 Undetermined	1	77.0 ± 0.0	NB
P	*Triadenum virginicum*	Virginia St John's-wort				S1	2 May Be At Risk	5	18.3 ± 0.0	NB
P	*Viburnum acerifolium*	Maple-leaved Viburnum				S1	2 May Be At Risk	10	93.8 ± 0.0	NB
P	*Drosera anglica*	English Sundew				S1	2 May Be At Risk	5	30.9 ± 0.0	NB
P	*Drosera linearis*	Slender-Leaved Sundew				S1	2 May Be At Risk	5	30.9 ± 0.0	NB
P	*Vaccinium boreale*	Northern Blueberry				S1	2 May Be At Risk	1	97.8 ± 0.0	NB
P	*Vaccinium corymbosum*	Highbush Blueberry				S1	3 Sensitive	9	49.1 ± 0.0	NB
P	*Desmodium glutinosum*	Large Tick-Trefoil				S1	2 May Be At Risk	9	31.0 ± 1.0	NB
P	*Lespedeza capitata*	Round-headed Bush-clover				S1	2 May Be At Risk	8	87.4 ± 0.0	NB
P	*Gentiana rubricaulis*	Purple-stemmed Gentian				S1	2 May Be At Risk	14	56.5 ± 0.0	NB
P	*Ribes cynosbati*	Prickly Gooseberry				S1	2 May Be At Risk	1	34.2 ± 0.0	NB
P	*Proserpinaca pectinata*	Comb-leaved Mermaidweed				S1	2 May Be At Risk	1	99.7 ± 0.0	NB
P	*Decodon verticillatus*	Swamp Loosestrife				S1	2 May Be At Risk	3	11.3 ± 0.0	NB
P	*Polygala verticillata var. verticillata*	Whorled Milkwort				S1	5 Undetermined	2	36.4 ± 0.0	NB
P	*Lysimachia hybrida*	Lowland Yellow Loosestrife				S1	2 May Be At Risk	15	74.0 ± 0.0	NB
P	*Ranunculus lapponicus*	Lapland Buttercup				S1	2 May Be At Risk	10	84.2 ± 1.0	NB
P	*Ranunculus sceleratus*	Cursed Buttercup				S1	2 May Be At Risk	4	45.5 ± 0.0	NB
P	*Crataegus jonesiae*	Jones' Hawthorn				S1	2 May Be At Risk	3	43.8 ± 1.0	NB
P	*Waldsteinia fragarioides*	Barren Strawberry				S1	2 May Be At Risk	27	20.8 ± 0.0	NB
P	*Galium brevipes*	Limestone Swamp Bedstraw				S1	2 May Be At Risk	4	50.5 ± 1.0	NB
P	*Agalinis paupercula var. borealis*	Small-flowered Agalinis				S1	2 May Be At Risk	5	41.4 ± 0.0	NB
P	*Agalinis tenuifolia*	Slender Agalinis				S1	2 May Be At Risk	6	49.0 ± 0.0	NB
P	*Pedicularis canadensis*	Canada Lousewort				S1	2 May Be At Risk	20	36.9 ± 0.0	NB
P	*Viola canadensis*	Canada Violet				S1	2 May Be At Risk	84	34.3 ± 0.0	NB
P	*Viola sagittata var. ovata*	Arrow-Leaved Violet				S1	2 May Be At Risk	10	33.5 ± 0.0	NB
P	*Alisma subcordatum*	Southern Water Plantain				S1	5 Undetermined	7	31.4 ± 0.0	NB
P	*Carex annectens*	Yellow-Fruited Sedge				S1	2 May Be At Risk	1	35.2 ± 0.0	NB
P	*Carex backii*	Rocky Mountain Sedge				S1	2 May Be At Risk	5	41.8 ± 0.0	NB
P	*Carex blanda*	Eastern Woodland Sedge				S1	2 May Be At Risk	1	35.0 ± 0.0	NB
P	*Carex cephaloidea*	Thin-leaved Sedge				S1	2 May Be At Risk	22	18.2 ± 0.0	NB
P	*Carex merritt-fernaldii*	Merritt Fernald's Sedge				S1	2 May Be At Risk	2	97.4 ± 0.0	NB
P	*Carex scirpoidea*	Scirpuslike Sedge				S1	2 May Be At Risk	2	98.2 ± 1.0	NB
P	*Carex sterilis*	Sterile Sedge				S1	2 May Be At Risk	12	26.7 ± 0.0	NB
P	*Carex grisea*	Inflated Narrow-leaved Sedge				S1	2 May Be At Risk	2	32.2 ± 5.0	NB
P	*Cyperus diandrus*	Low Flatsedge				S1	2 May Be At Risk	7	32.1 ± 0.0	NB
P	*Cyperus lupulinus*	Hop Flatsedge				S1	2 May Be At Risk	6	82.5 ± 0.0	NB
P	*Cyperus lupulinus ssp. macilentus*	Hop Flatsedge				S1	2 May Be At Risk	16	82.7 ± 1.0	NB
P	*Eleocharis olivacea*	Yellow Spikerush				S1	2 May Be At Risk	3	83.1 ± 1.0	NB
P	*Rhynchospora capillacea*	Slender Beakrush				S1	2 May Be At Risk	7	30.4 ± 0.0	NB
P	*Sisyrinchium angustifolium*	Narrow-leaved Blue-eyed-				S1	2 May Be At Risk	2	21.4 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
		grass								
P	*Juncus subtilis*	Creeping Rush				S1	2 May Be At Risk	1	93.6 ± 5.0	NB
P	*Allium canadense*	Canada Garlic				S1	2 May Be At Risk	10	27.2 ± 5.0	NB
P	*Goodyera pubescens*	Downy Rattlesnake-Plantain				S1	2 May Be At Risk	1	44.2 ± 0.0	NB
P	*Malaxis brachypoda*	White Adder's-Mouth				S1	2 May Be At Risk	12	35.6 ± 0.0	NB
P	*Platanthera flava var. herbiola*	Pale Green Orchid				S1	2 May Be At Risk	13	22.0 ± 0.0	NB
P	*Platanthera macrophylla*	Large Round-Leaved Orchid				S1	2 May Be At Risk	4	32.3 ± 4.0	NB
P	*Spiranthes casei*	Case's Ladies'-Tresses				S1	2 May Be At Risk	6	36.9 ± 0.0	NB
P	*Bromus pubescens*	Hairy Wood Brome Grass				S1	5 Undetermined	6	82.1 ± 0.0	NB
P	*Cinna arundinacea*	Sweet Wood Reed Grass				S1	2 May Be At Risk	19	81.4 ± 0.0	NB
P	*Danthonia compressa*	Flattened Oat Grass				S1	2 May Be At Risk	2	17.9 ± 0.0	NB
P	*Dichanthelium dichotomum*	Forked Panic Grass				S1	2 May Be At Risk	18	88.0 ± 0.0	NB
P	*Dichanthelium xanthophysum*	Slender Panic Grass				S1	2 May Be At Risk	4	75.4 ± 0.0	NB
P	*Elymus hystrix var. bigeloviana*	Spreading Wild Rye				S1	2 May Be At Risk	30	21.0 ± 0.0	NB
P	*Festuca subverticillata*	Nodding Fescue				S1	2 May Be At Risk	14	45.1 ± 0.0	NB
P	*Glyceria obtusa*	Atlantic Manna Grass				S1	2 May Be At Risk	5	85.5 ± 0.0	NB
P	*Sporobolus compositus*	Rough Dropseed				S1	2 May Be At Risk	17	28.3 ± 0.0	NB
P	*Potamogeton friesii*	Fries' Pondweed				S1	2 May Be At Risk	2	41.7 ± 5.0	NB
P	*Potamogeton nodosus*	Long-leaved Pondweed				S1	2 May Be At Risk	14	47.0 ± 0.0	NB
P	*Dryopteris clintoniana*	Clinton's Wood Fern				S1	2 May Be At Risk	10	35.0 ± 0.0	NB
P	*Botrychium oneidense*	Blunt-lobed Moonwort				S1	2 May Be At Risk	8	25.6 ± 0.0	NB
P	*Botrychium rugulosum*	Rugulose Moonwort				S1	2 May Be At Risk	5	25.6 ± 0.0	NB
P	*Hieracium kalmii var. fasciculatum*	Kalm's Hawkweed				S1?	5 Undetermined	1	47.5 ± 1.0	NB
P	*Cuscuta campestris*	Field Dodder				S1?	2 May Be At Risk	3	90.0 ± 10.0	NB
P	*Galium trifidum ssp. subbiflorum*	Three-petaled Bedstraw				S1?	5 Undetermined	1	43.0 ± 1.0	NB
P	*Carex laxiflora*	Loose-Flowered Sedge				S1?	5 Undetermined	1	42.8 ± 0.0	NB
P	*Carex appalachica*	Appalachian Sedge				S1?	5 Undetermined	1	41.1 ± 0.0	NB
P	*Sisyrinchium mucronatum*	Michaux's Blue-eyed-grass				S1?	5 Undetermined	3	38.2 ± 0.0	NB
P	*Wolffia columbiana*	Columbian Watermeal				S1?	2 May Be At Risk	5	46.8 ± 0.0	NB
P	*Rumex aquaticus var. fenestratus*	Western Dock				S1S2	2 May Be At Risk	1	44.4 ± 1.0	NB
P	*Anemone multifida var. richardsiana*	Cut-leaved Anemone				S1S2	5 Undetermined	3	43.2 ± 5.0	NB
P	*Saxifraga virginiensis*	Early Saxifrage				S1S2	2 May Be At Risk	14	25.7 ± 5.0	NB
P	*Potamogeton bicupulatus*	Snailseed Pondweed				S1S2	2 May Be At Risk	5	76.7 ± 0.0	NB
P	*Selaginella rupestris*	Rock Spikemoss				S1S2	2 May Be At Risk	7	28.6 ± 0.0	NB
P	*Thelypteris simulata*	Bog Fern				S1S2	2 May Be At Risk	7	73.4 ± 0.0	NB
P	*Cuscuta cephalanthi*	Buttonbush Dodder				S1S3	2 May Be At Risk	3	99.5 ± 1.0	NB
P	*Listera australis*	Southern Twayblade			Endangered	S2	1 At Risk	15	31.6 ± 0.0	NB
P	*Osmorhiza longistylis*	Smooth Sweet Cicely				S2	3 Sensitive	9	26.8 ± 5.0	NB
P	*Sanicula odorata*	Clustered Sanicle				S2	2 May Be At Risk	26	20.9 ± 0.0	NB
P	*Pseudognaphalium macounii*	Macoun's Cudweed				S2	3 Sensitive	10	22.1 ± 0.0	NB
P	*Solidago simplex var. racemosa*	Sticky Goldenrod				S2	2 May Be At Risk	39	1.8 ± 1.0	NB
P	*Ionactis linariifolius*	Stiff Aster				S2	3 Sensitive	13	41.7 ± 0.0	NB
P	*Symphyotrichum racemosum*	Small White Aster				S2	3 Sensitive	8	44.6 ± 0.0	NB
P	*Impatiens pallida*	Pale Jewelweed				S2	2 May Be At Risk	5	33.3 ± 0.0	NB
P	*Alnus serrulata*	Smooth Alder				S2	3 Sensitive	57	21.0 ± 1.0	NB
P	*Arabis drummondii*	Drummond's Rockcress				S2	3 Sensitive	8	28.2 ± 0.0	NB
P	*Stellaria longifolia*	Long-leaved Starwort				S2	3 Sensitive	7	45.3 ± 10.0	NB
P	*Hypericum dissimulatum*	Disguised St John's-wort				S2	3 Sensitive	1	57.9 ± 0.0	NB
P	*Triosteum aurantiacum*	Orange-fruited Tinker's				S2	3 Sensitive	181	5.1 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
		Weed								
P	*Viburnum lentago*	Nannyberry				S2	4 Secure	130	27.5 ± 0.0	NB
P	*Viburnum recognitum*	Northern Arrow-Wood				S2	4 Secure	167	32.5 ± 10.0	NB
P	*Shepherdia canadensis*	Soapberry				S2	3 Sensitive	6	95.2 ± 0.0	NB
P	*Astragalus eucosmus*	Elegant Milk-vetch				S2	2 May Be At Risk	14	27.3 ± 1.0	NB
P	*Oxytropis campestris var. johannensis*	Field Locoweed				S2	3 Sensitive	11	8.3 ± 1.0	NB
P	*Quercus macrocarpa*	Bur Oak				S2	2 May Be At Risk	42	8.8 ± 1.0	NB
P	*Gentiana linearis*	Narrow-Leaved Gentian				S2	3 Sensitive	13	45.2 ± 1.0	NB
P	*Myriophyllum humile*	Low Water Milfoil				S2	3 Sensitive	10	44.6 ± 0.0	NB
P	*Proserpinaca palustris var. crebra*	Marsh Mermaidweed				S2	3 Sensitive	21	47.0 ± 1.0	NB
P	*Hedeoma pulegioides*	American False Pennyroyal				S2	4 Secure	8	1.8 ± 1.0	NB
P	*Nuphar lutea ssp. rubrodisca*	Red-disked Yellow Pond-lily				S2	3 Sensitive	12	33.7 ± 0.0	NB
P	*Orobanche uniflora*	One-Flowered Broomrape				S2	3 Sensitive	7	42.9 ± 1.0	NB
P	*Polygala paucifolia*	Fringed Milkwort				S2	3 Sensitive	11	44.3 ± 0.0	NB
P	*Polygala senega*	Seneca Snakeroot				S2	3 Sensitive	50	1.5 ± 100.0	NB
P	*Polygonum amphibium var. emersum*	Water Smartweed				S2	3 Sensitive	23	42.8 ± 1.0	NB
P	*Polygonum careyi*	Carey's Smartweed				S2	3 Sensitive	14	45.5 ± 1.0	NB
P	*Podostemum ceratophyllum*	Horn-leaved Riverweed				S2	3 Sensitive	45	8.7 ± 0.0	NB
P	*Anemone multifida*	Cut-leaved Anemone				S2	3 Sensitive	8	28.9 ± 0.0	NB
P	*Hepatica nobilis var. obtusa*	Round-lobed Hepatica				S2	3 Sensitive	55	21.8 ± 0.0	NB
P	*Ranunculus flabellaris*	Yellow Water Buttercup				S2	4 Secure	20	49.2 ± 0.0	NB
P	*Ranunculus longirostris*	Eastern White Water-Crowfoot				S2	5 Undetermined	8	37.0 ± 1.0	NB
P	*Crataegus scabrida*	Rough Hawthorn				S2	3 Sensitive	4	41.3 ± 0.0	NB
P	*Crataegus succulenta*	Fleshy Hawthorn				S2	3 Sensitive	1	45.3 ± 5.0	NB
P	*Rosa acicularis ssp. sayi*	Prickly Rose				S2	2 May Be At Risk	34	69.6 ± 0.0	NB
P	*Cephalanthus occidentalis*	Common Buttonbush				S2	3 Sensitive	66	11.4 ± 0.0	NB
P	*Salix candida*	Sage Willow				S2	3 Sensitive	25	21.4 ± 1.0	NB
P	*Castilleja septentrionalis*	Northeastern Paintbrush				S2	3 Sensitive	12	40.3 ± 0.0	NB
P	*Scrophularia lanceolata*	Lance-leaved Figwort				S2	3 Sensitive	11	20.1 ± 1.0	NB
P	*Dirca palustris*	Eastern Leatherwood				S2	2 May Be At Risk	53	7.5 ± 1.0	NB
P	*Phryma leptostachya*	American Lopseed				S2	3 Sensitive	82	20.9 ± 0.0	NB
P	*Verbena urticifolia*	White Vervain				S2	2 May Be At Risk	31	18.2 ± 1.0	NB
P	*Viola novae-angliae*	New England Violet				S2	3 Sensitive	4	44.9 ± 10.0	NB
P	*Symplocarpus foetidus*	Eastern Skunk Cabbage				S2	3 Sensitive	41	23.0 ± 0.0	NB
P	*Carex comosa*	Bearded Sedge				S2	2 May Be At Risk	7	48.8 ± 0.0	NB
P	*Carex granularis*	Limestone Meadow Sedge				S2	3 Sensitive	8	26.1 ± 1.0	NB
P	*Carex gynocrates*	Northern Bog Sedge				S2	3 Sensitive	52	30.9 ± 0.0	NB
P	*Carex hirtifolia*	Pubescent Sedge				S2	3 Sensitive	76	20.9 ± 0.0	NB
P	*Carex livida var. radicaulis*	Livid Sedge				S2	3 Sensitive	30	48.7 ± 0.0	NB
P	*Carex plantaginea*	Plantain-Leaved Sedge				S2	3 Sensitive	117	34.3 ± 0.0	NB
P	*Carex prairea*	Prairie Sedge				S2	3 Sensitive	38	43.9 ± 0.0	NB
P	*Carex rostrata*	Narrow-leaved Beaked Sedge				S2	3 Sensitive	7	42.5 ± 0.0	NB
P	*Carex sprengelii*	Longbeak Sedge				S2	3 Sensitive	48	20.9 ± 0.0	NB
P	*Carex tenuiflora*	Sparse-Flowered Sedge				S2	2 May Be At Risk	33	31.8 ± 0.0	NB
P	*Carex albicans var. emmonsii*	White-tinged Sedge				S2	3 Sensitive	3	88.2 ± 0.0	NB
P	*Cyperus squarrosus*	Awned Flatsedge				S2	3 Sensitive	29	47.8 ± 0.0	NB
P	*Eriophorum gracile*	Slender Cottongrass				S2	2 May Be At Risk	13	49.7 ± 0.0	NB
P	*Elodea nuttallii*	Nuttall's Waterweed				S2	3 Sensitive	10	38.1 ± 0.0	NB
P	*Juncus vaseyi*	Vasey Rush				S2	3 Sensitive	9	69.1 ± 0.0	NB
P	*Allium tricoccum*	Wild Leek				S2	2 May Be At Risk	15	20.9 ± 0.0	NB
P	*Najas gracillima*	Thread-Like Naiad				S2	3 Sensitive	11	74.2 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	*Amerorchis rotundifolia*	Small Round-leaved Orchis				S2	2 May Be At Risk	5	89.9 ± 100.0	NB
P	*Calypso bulbosa var. americana*	Calypso				S2	2 May Be At Risk	36	28.1 ± 0.0	NB
P	*Coeloglossum viride var. virescens*	Long-bracted Frog Orchid				S2	2 May Be At Risk	7	45.6 ± 5.0	NB
P	*Cypripedium parviflorum var. makasin*	Small Yellow Lady's-Slipper				S2	2 May Be At Risk	12	14.2 ± 50.0	NB
P	*Galearis spectabilis*	Showy Orchis				S2	2 May Be At Risk	63	20.9 ± 0.0	NB
P	*Goodyera oblongifolia*	Menzies' Rattlesnake-plantain				S2	3 Sensitive	2	56.9 ± 0.0	NB
P	*Spiranthes lucida*	Shining Ladies'-Tresses				S2	3 Sensitive	20	20.9 ± 0.0	NB
P	*Spiranthes ochroleuca*	Yellow Ladies'-tresses				S2	2 May Be At Risk	2	55.8 ± 5.0	NB
P	*Agrostis mertensii*	Northern Bent Grass				S2	2 May Be At Risk	1	72.6 ± 0.0	NB
P	*Dichanthelium linearifolium*	Narrow-leaved Panic Grass				S2	3 Sensitive	12	24.0 ± 0.0	NB
P	*Elymus canadensis*	Canada Wild Rye				S2	2 May Be At Risk	21	8.0 ± 1.0	NB
P	*Leersia virginica*	White Cut Grass				S2	2 May Be At Risk	42	31.4 ± 1.0	NB
P	*Piptatherum canadense*	Canada Rice Grass				S2	3 Sensitive	5	38.8 ± 1.0	NB
P	*Puccinellia phryganodes*	Creeping Alkali Grass				S2	3 Sensitive	6	92.0 ± 10.0	NB
P	*Schizachyrium scoparium*	Little Bluestem				S2	3 Sensitive	43	2.3 ± 1.0	NB
P	*Zizania aquatica var. aquatica*	Indian Wild Rice				S2	5 Undetermined	4	42.4 ± 0.0	NB
P	*Piptatherum pungens*	Slender Rice Grass				S2	2 May Be At Risk	5	72.2 ± 0.0	NB
P	*Potamogeton vaseyi*	Vasey's Pondweed				S2	3 Sensitive	8	8.8 ± 0.0	NB
P	*Asplenium trichomanes*	Maidenhair Spleenwort				S2	3 Sensitive	5	25.7 ± 0.0	NB
P	*Woodwardia virginica*	Virginia Chain Fern				S2	3 Sensitive	19	17.8 ± 0.0	NB
P	*Woodsia alpina*	Alpine Cliff Fern				S2	3 Sensitive	16	99.6 ± 0.0	NB
P	*Toxicodendron radicans*	Poison Ivy				S2?	3 Sensitive	12	32.3 ± 1.0	NB
P	*Symphyotrichum novi-belgii var. crenifolium*	New York Aster				S2?	5 Undetermined	1	43.5 ± 1.0	NB
P	*Humulus lupulus var. lupuloides*	Common Hop				S2?	3 Sensitive	5	33.9 ± 0.0	NB
P	*Rubus recurvicaulis*	Arching Dewberry				S2?	4 Secure	2	69.4 ± 1.0	NB
P	*Galium obtusum*	Blunt-leaved Bedstraw				S2?	4 Secure	4	21.0 ± 1.0	NB
P	*Salix myricoides*	Bayberry Willow				S2?	3 Sensitive	19	22.0 ± 0.0	NB
P	*Carex vacillans*	Estuarine Sedge				S2?	3 Sensitive	2	93.5 ± 10.0	NB
P	*Platanthera huronensis*	Fragrant Green Orchid				S2?	5 Undetermined	3	54.7 ± 0.0	NB
P	*Solidago altissima*	Tall Goldenrod				S2S3	4 Secure	53	32.2 ± 0.0	NB
P	*Barbarea orthoceras*	American Yellow Rocket				S2S3	3 Sensitive	4	38.0 ± 0.0	NB
P	*Ceratophyllum echinatum*	Prickly Hornwort				S2S3	3 Sensitive	15	39.6 ± 0.0	NB
P	*Callitriche hermaphroditica*	Northern Water-starwort				S2S3	4 Secure	3	77.1 ± 0.0	NB
P	*Lonicera oblongifolia*	Swamp Fly Honeysuckle				S2S3	3 Sensitive	144	20.9 ± 0.0	NB
P	*Elatine americana*	American Waterwort				S2S3	3 Sensitive	4	75.0 ± 1.0	NB
P	*Bartonia paniculata ssp. iodandra*	Branched Bartonia				S2S3	3 Sensitive	1	89.7 ± 0.0	NB
P	*Geranium robertianum*	Herb Robert				S2S3	4 Secure	1	96.3 ± 0.0	NB
P	*Epilobium coloratum*	Purple-veined Willowherb				S2S3	3 Sensitive	7	27.6 ± 5.0	NB
P	*Rumex pallidus*	Seabeach Dock				S2S3	3 Sensitive	1	88.5 ± 1.0	NB
P	*Amelanchier sanguinea var. gaspensis*	Round-Leaved Serviceberry				S2S3	5 Undetermined	1	34.8 ± 0.0	NB
P	*Rubus pensilvanicus*	Pennsylvania Blackberry				S2S3	4 Secure	10	32.7 ± 0.0	NB
P	*Galium labradoricum*	Labrador Bedstraw				S2S3	3 Sensitive	110	30.9 ± 0.0	NB
P	*Valeriana uliginosa*	Swamp Valerian				S2S3	3 Sensitive	58	21.0 ± 0.0	NB
P	*Carex adusta*	Lesser Brown Sedge				S2S3	4 Secure	6	65.3 ± 10.0	NB
P	*Juncus brachycephalus*	Small-Head Rush				S2S3	3 Sensitive	10	23.2 ± 0.0	NB
P	*Corallorhiza maculata var. occidentalis*	Spotted Coralroot				S2S3	3 Sensitive	7	10.9 ± 1.0	NB
P	*Corallorhiza maculata var.*	Spotted Coralroot				S2S3	3 Sensitive	3	43.8 ± 1.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
	maculata									
P	*Listera auriculata*	Auricled Twayblade				S2S3	3 Sensitive	9	31.7 ± 0.0	NB
P	*Spiranthes cernua*	Nodding Ladies'-Tresses				S2S3	3 Sensitive	10	26.3 ± 0.0	NB
P	*Eragrostis pectinacea*	Tufted Love Grass				S2S3	4 Secure	13	32.8 ± 1.0	NB
P	*Stuckenia filiformis ssp. alpina*	Thread-leaved Pondweed				S2S3	3 Sensitive	6	42.7 ± 0.0	NB
P	*Potamogeton praelongus*	White-stemmed Pondweed				S2S3	4 Secure	13	14.4 ± 0.0	NB
P	*Isoetes acadiensis*	Acadian Quillwort				S2S3	3 Sensitive	10	33.3 ± 0.0	NB
P	*Ophioglossum pusillum*	Northern Adder's-tongue				S2S3	3 Sensitive	8	26.3 ± 0.0	NB
P	*Botrychium tenebrosum*	Swamp Moonwort				S2S3	3 Sensitive	1	73.9 ± 0.0	NB
P	*Panax trifolius*	Dwarf Ginseng				S3	3 Sensitive	13	16.8 ± 1.0	NB
P	*Arnica lanceolata*	Lance-leaved Arnica				S3	4 Secure	24	47.1 ± 0.0	NB
P	*Artemisia campestris*	Field Wormwood				S3	4 Secure	22	32.3 ± 1.0	NB
P	*Artemisia campestris ssp. caudata*	Field Wormwood				S3	4 Secure	80	8.3 ± 1.0	NB
P	*Erigeron hyssopifolius*	Hyssop-leaved Fleabane				S3	4 Secure	36	21.0 ± 1.0	NB
P	*Prenanthes racemosa*	Glaucous Rattlesnakeroot				S3	4 Secure	15	23.0 ± 0.0	NB
P	*Tanacetum bipinnatum ssp. huronense*	Lake Huron Tansy				S3	4 Secure	34	8.3 ± 1.0	NB
P	*Symphyotrichum boreale*	Boreal Aster				S3	3 Sensitive	154	20.2 ± 0.0	NB
P	*Betula pumila*	Bog Birch				S3	4 Secure	43	30.9 ± 0.0	NB
P	*Arabis glabra*	Tower Mustard				S3	5 Undetermined	13	26.6 ± 0.0	NB
P	*Arabis hirsuta var. pycnocarpa*	Western Hairy Rockcress				S3	4 Secure	13	29.1 ± 1.0	NB
P	*Cardamine maxima*	Large Toothwort				S3	4 Secure	99	25.8 ± 0.0	NB
P	*Subularia aquatica var. americana*	Water Awlwort				S3	4 Secure	18	33.7 ± 0.0	NB
P	*Lobelia cardinalis*	Cardinal Flower				S3	4 Secure	378	8.3 ± 1.0	NB
P	*Stellaria humifusa*	Saltmarsh Starwort				S3	4 Secure	1	93.2 ± 0.0	NB
P	*Hudsonia tomentosa*	Woolly Beach-heath				S3	4 Secure	2	99.6 ± 0.0	NB
P	*Cornus amomum ssp. obliqua*	Pale Dogwood				S3	3 Sensitive	215	22.6 ± 1.0	NB
P	*Crassula aquatica*	Water Pygmyweed				S3	4 Secure	3	74.9 ± 1.0	NB
P	*Penthorum sedoides*	Ditch Stonecrop				S3	4 Secure	49	15.3 ± 1.0	NB
P	*Elatine minima*	Small Waterwort				S3	4 Secure	52	7.9 ± 0.0	NB
P	*Astragalus alpinus var. brunetianus*	Alpine Milk-Vetch				S3	4 Secure	14	19.9 ± 0.0	NB
P	*Hedysarum alpinum*	Alpine Sweet-vetch				S3	4 Secure	34	38.3 ± 0.0	NB
P	*Gentianella amarella ssp. acuta*	Northern Gentian				S3	4 Secure	9	14.3 ± 0.0	NB
P	*Geranium bicknellii*	Bicknell's Crane's-bill				S3	4 Secure	5	69.2 ± 5.0	NB
P	*Myriophyllum farwellii*	Farwell's Water Milfoil				S3	4 Secure	21	31.2 ± 0.0	NB
P	*Myriophyllum heterophyllum*	Variable-leaved Water Milfoil				S3	4 Secure	28	71.3 ± 0.0	NB
P	*Myriophyllum verticillatum*	Whorled Water Milfoil				S3	4 Secure	18	27.6 ± 0.0	NB
P	*Stachys tenuifolia*	Smooth Hedge-Nettle				S3	3 Sensitive	16	29.1 ± 0.0	NB
P	*Utricularia radiata*	Little Floating Bladderwort				S3	4 Secure	36	37.0 ± 0.0	NB
P	*Nuphar lutea ssp. pumila*	Small Yellow Pond-lily				S3	4 Secure	21	30.8 ± 5.0	NB
P	*Epilobium strictum*	Downy Willowherb				S3	4 Secure	59	26.0 ± 1.0	NB
P	*Polygala sanguinea*	Blood Milkwort				S3	3 Sensitive	25	1.6 ± 1.0	NB
P	*Polygonum arifolium*	Halberd-leaved Tearthumb				S3	4 Secure	23	37.9 ± 0.0	NB
P	*Polygonum punctatum*	Dotted Smartweed				S3	4 Secure	2	43.2 ± 0.0	NB
P	*Polygonum punctatum var. confertiflorum*	Dotted Smartweed				S3	4 Secure	10	14.3 ± 0.0	NB
P	*Polygonum scandens*	Climbing False Buckwheat				S3	4 Secure	32	30.9 ± 1.0	NB
P	*Littorella uniflora*	American Shoreweed				S3	4 Secure	28	32.1 ± 0.0	NB
P	*Primula mistassinica*	Mistassini Primrose				S3	4 Secure	14	27.1 ± 3.0	NB
P	*Pyrola minor*	Lesser Pyrola				S3	4 Secure	2	62.1 ± 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	*Clematis occidentalis*	Purple Clematis				S3	4 Secure	29	31.0 ± 1.0	NB
P	*Ranunculus gmelinii*	Gmelin's Water Buttercup				S3	4 Secure	41	21.6 ± 0.0	NB
P	*Thalictrum venulosum*	Northern Meadow-rue				S3	4 Secure	89	12.2 ± 0.0	NB
P	*Amelanchier canadensis*	Canada Serviceberry				S3	4 Secure	14	34.2 ± 1.0	NB
P	*Rosa palustris*	Swamp Rose				S3	4 Secure	40	18.9 ± 0.0	NB
P	*Rubus occidentalis*	Black Raspberry				S3	4 Secure	121	5.1 ± 0.0	NB
P	*Galium boreale*	Northern Bedstraw				S3	4 Secure	13	17.7 ± 1.0	NB
P	*Salix interior*	Sandbar Willow				S3	4 Secure	41	27.2 ± 1.0	NB
P	*Salix nigra*	Black Willow				S3	3 Sensitive	99	32.3 ± 1.0	NB
P	*Salix pedicellaris*	Bog Willow				S3	4 Secure	90	31.5 ± 0.0	NB
P	*Comandra umbellata*	Bastard's Toadflax				S3	4 Secure	1	90.2 ± 10.0	NB
P	*Parnassia glauca*	Fen Grass-of-Parnassus				S3	4 Secure	17	26.5 ± 10.0	NB
P	*Limosella australis*	Southern Mudwort				S3	4 Secure	1	89.5 ± 5.0	NB
P	*Veronica serpyllifolia ssp. humifusa*	Thyme-Leaved Speedwell				S3	4 Secure	6	6.1 ± 10.0	NB
P	*Boehmeria cylindrica*	Small-spike False-nettle				S3	3 Sensitive	149	7.9 ± 0.0	NB
P	*Pilea pumila*	Dwarf Clearweed				S3	4 Secure	56	4.9 ± 1.0	NB
P	*Viola adunca*	Hooked Violet				S3	4 Secure	8	37.4 ± 0.0	NB
P	*Viola nephrophylla*	Northern Bog Violet				S3	4 Secure	80	19.7 ± 1.0	NB
P	*Carex arcta*	Northern Clustered Sedge				S3	4 Secure	55	44.5 ± 0.0	NB
P	*Carex atratiformis*	Scabrous Black Sedge				S3	4 Secure	3	82.4 ± 0.0	NB
P	*Carex capillaris*	Hairlike Sedge				S3	4 Secure	14	41.7 ± 0.0	NB
P	*Carex chordorrhiza*	Creeping Sedge				S3	4 Secure	89	17.6 ± 0.0	NB
P	*Carex conoidea*	Field Sedge				S3	4 Secure	6	26.0 ± 1.0	NB
P	*Carex eburnea*	Bristle-leaved Sedge				S3	4 Secure	9	47.2 ± 0.0	NB
P	*Carex exilis*	Coastal Sedge				S3	4 Secure	49	30.9 ± 0.0	NB
P	*Carex garberi*	Garber's Sedge				S3	3 Sensitive	13	45.4 ± 0.0	NB
P	*Carex haydenii*	Hayden's Sedge				S3	4 Secure	31	31.4 ± 0.0	NB
P	*Carex lupulina*	Hop Sedge				S3	4 Secure	102	28.9 ± 0.0	NB
P	*Carex michauxiana*	Michaux's Sedge				S3	4 Secure	25	70.1 ± 0.0	NB
P	*Carex ormostachya*	Necklace Spike Sedge				S3	4 Secure	19	6.1 ± 10.0	NB
P	*Carex rosea*	Rosy Sedge				S3	4 Secure	227	8.6 ± 0.0	NB
P	*Carex tenera*	Tender Sedge				S3	4 Secure	32	20.6 ± 0.0	NB
P	*Carex tuckermanii*	Tuckerman's Sedge				S3	4 Secure	71	20.9 ± 0.0	NB
P	*Carex vaginata*	Sheathed Sedge				S3	3 Sensitive	18	21.1 ± 0.0	NB
P	*Carex wiegandii*	Wiegand's Sedge				S3	4 Secure	17	43.8 ± 0.0	NB
P	*Carex recta*	Estuary Sedge				S3	4 Secure	3	86.5 ± 0.0	NB
P	*Cyperus dentatus*	Toothed Flatsedge				S3	4 Secure	119	22.0 ± 0.0	NB
P	*Cyperus esculentus*	Perennial Yellow Nutsedge				S3	4 Secure	36	8.3 ± 1.0	NB
P	*Eleocharis intermedia*	Matted Spikerush				S3	4 Secure	11	4.2 ± 0.0	NB
P	*Eleocharis quinqueflora*	Few-flowered Spikerush				S3	4 Secure	32	33.6 ± 0.0	NB
P	*Rhynchospora capitellata*	Small-headed Beakrush				S3	4 Secure	31	46.8 ± 0.0	NB
P	*Rhynchospora fusca*	Brown Beakrush				S3	4 Secure	27	19.3 ± 1.0	NB
P	*Trichophorum clintonii*	Clinton's Clubrush				S3	4 Secure	73	20.9 ± 0.0	NB
P	*Schoenoplectus fluviatilis*	River Bulrush				S3	3 Sensitive	22	64.3 ± 0.0	NB
P	*Schoenoplectus torreyi*	Torrey's Bulrush				S3	4 Secure	23	56.0 ± 0.0	NB
P	*Lemna trisulca*	Star Duckweed				S3	4 Secure	1	94.1 ± 0.0	NB
P	*Triantha glutinosa*	Sticky False-Asphodel				S3	4 Secure	106	27.4 ± 1.0	NB
P	*Cypripedium reginae*	Showy Lady's-Slipper				S3	3 Sensitive	122	21.1 ± 0.0	NB
P	*Liparis loeselii*	Loesel's Twayblade				S3	4 Secure	18	14.3 ± 0.0	NB
P	*Platanthera blephariglottis*	White Fringed Orchid				S3	4 Secure	66	18.0 ± 0.0	NB
P	*Platanthera grandiflora*	Large Purple Fringed Orchid				S3	3 Sensitive	33	22.1 ± 0.0	NB
P	*Bromus latiglumis*	Broad-Glumed Brome				S3	3 Sensitive	30	29.4 ± 0.0	NB
P	*Calamagrostis pickeringii*	Pickering's Reed Grass				S3	4 Secure	8	82.2 ± 0.0	NB
P	*Dichanthelium depauperatum*	Starved Panic Grass				S3	4 Secure	26	68.8 ± 0.0	NB
P	*Muhlenbergia richardsonis*	Mat Muhly				S3	4 Secure	35	28.4 ± 1.0	NB
P	*Heteranthera dubia*	Water Stargrass				S3	4 Secure	22	1.3 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	*Potamogeton obtusifolius*	Blunt-leaved Pondweed				S3	4 Secure	38	17.7 ± 0.0	NB
P	*Potamogeton richardsonii*	Richardson's Pondweed				S3	3 Sensitive	10	46.0 ± 5.0	NB
P	*Xyris montana*	Northern Yellow-Eyed-Grass				S3	4 Secure	12	28.4 ± 0.0	NB
P	*Adiantum pedatum*	Northern Maidenhair Fern				S3	4 Secure	305	8.0 ± 1.0	NB
P	*Cryptogramma stelleri*	Steller's Rockbrake				S3	4 Secure	1	99.6 ± 0.0	NB
P	*Dryopteris fragrans var. remotiuscula*	Fragrant Wood Fern				S3	4 Secure	11	26.4 ± 0.0	NB
P	*Dryopteris goldiana*	Goldie's Woodfern				S3	3 Sensitive	215	7.9 ± 1.0	NB
P	*Woodsia glabella*	Smooth Cliff Fern				S3	4 Secure	1	99.7 ± 0.0	NB
P	*Equisetum palustre*	Marsh Horsetail				S3	4 Secure	9	31.0 ± 1.0	NB
P	*Isoetes tuckermanii*	Tuckerman's Quillwort				S3	4 Secure	16	33.4 ± 0.0	NB
P	*Lycopodium sabinifolium*	Ground-Fir				S3	4 Secure	11	32.7 ± 5.0	NB
P	*Botrychium dissectum*	Cut-leaved Moonwort				S3	4 Secure	51	9.8 ± 1.0	NB
P	*Botrychium lanceolatum var. angustisegmentum*	Lance-Leaf Grape-Fern				S3	3 Sensitive	16	9.8 ± 1.0	NB
P	*Botrychium simplex*	Least Moonwort				S3	4 Secure	12	19.0 ± 0.0	NB
P	*Polypodium appalachianum*	Appalachian Polypody				S3	4 Secure	24	6.1 ± 10.0	NB
P	*Utricularia resupinata*	Inverted Bladderwort				S3?	4 Secure	9	68.5 ± 0.0	NB
P	*Crataegus submollis*	Quebec Hawthorn				S3?	3 Sensitive	12	31.4 ± 100.0	NB
P	*Lobelia kalmii*	Brook Lobelia				S3S4	4 Secure	47	17.7 ± 1.0	NB
P	*Suaeda calceoliformis*	Horned Sea-blite				S3S4	4 Secure	1	45.8 ± 0.0	NB
P	*Myriophyllum sibiricum*	Siberian Water Milfoil				S3S4	4 Secure	8	14.4 ± 0.0	NB
P	*Stachys pilosa*	Hairy Hedge-Nettle				S3S4	5 Undetermined	5	32.2 ± 0.0	NB
P	*Utricularia gibba*	Humped Bladderwort				S3S4	4 Secure	32	18.4 ± 0.0	NB
P	*Potentilla arguta*	Tall Cinquefoil				S3S4	4 Secure	51	12.4 ± 1.0	NB
P	*Geocaulon lividum*	Northern Comandra				S3S4	4 Secure	4	95.3 ± 0.0	NB
P	*Cladium mariscoides*	Smooth Twigrush				S3S4	4 Secure	85	18.7 ± 0.0	NB
P	*Eriophorum russeolum*	Russet Cottongrass				S3S4	4 Secure	10	24.7 ± 1.0	NB
P	*Triglochin gaspensis*	Gasp├⌐ Arrowgrass				S3S4	4 Secure	2	93.5 ± 1.0	NB
P	*Spirodela polyrrhiza*	Great Duckweed				S3S4	4 Secure	36	8.7 ± 0.0	NB
P	*Corallorhiza maculata*	Spotted Coralroot				S3S4	3 Sensitive	10	15.6 ± 2.0	NB
P	*Potamogeton oakesianus*	Oakes' Pondweed				S3S4	4 Secure	22	32.0 ± 0.0	NB
P	*Oligoneuron album*	Upland White Goldenrod				SX	0.1 Extirpated	3	31.6 ± 1.0	NB
P	*Celastrus scandens*	Climbing Bittersweet				SX	0.1 Extirpated	4	8.3 ± 1.0	NB

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

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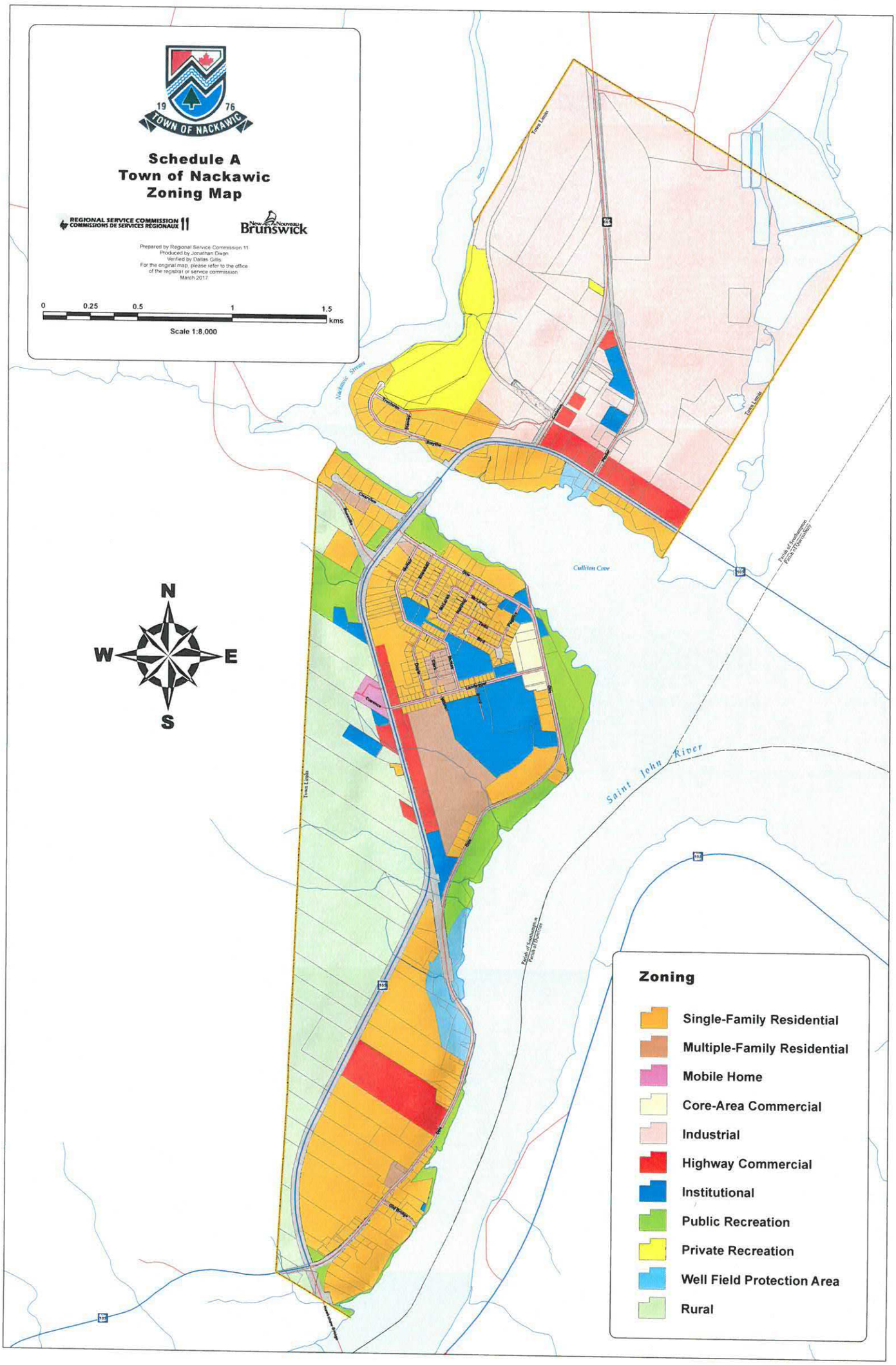
8	Bateman, M.C. 2000. Waterfowl Brood Surveys Database, 1990-2000 . Canadian Wildlife Service, Sackville, unpublished data. 149 recs.
8	Goltz, J.P. & Bishop, G. 2005. Confidential supplement to Status Report on Prototype Quillwort (Isoetes prototypus). Committee on the Status of Endangered Wildlife in Canada, 111 recs.
7	Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
7	Goltz, J.P. 1994. In the Footsteps of Our Ancestors. NB Naturalists, 21 (2-4): 20. 8 recs.
7	Keppie, D.M. 2005. Rare Small Mammal Records in NB, PE. Pers. comm. to K. Bredin; PE 1 rec., NB 24 recs, 23 recs.
7	Klymko, J.J.D. 2012. Insect fieldwork & submissions, 2003-11. Atlantic Canada Conservation Data Centre. Sackville NB, 1337 recs.
6	Brunelle, P.-M. (compiler). 2010. ADIP/MDDS Odonata Database: NB, NS Update 1900-09. Atlantic Dragonfly Inventory Program (ADIP), 935 recs.
6	Chaput, G. 2002. Atlantic Salmon: Maritime Provinces Overview for 2001. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-14. 39 recs.
6	Cronin, P. & Ayer, C.; Dubee, B.; Hooper, W.C.; LeBlanc, E.; Madden, A.; Pettigrew, T.; Seymour, P. 1998. Fish Species Management Plans (draft). NB DNRE Internal Report. Fredericton, 164pp.
6	Newell, R.E. 2008. Vascular Plants of Muzroll Lake. Pers. comm. to C.S. Blaney, 1 pg. 43 recs.
6	Popma, T.M. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 113 recs.
5	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2013.
5	Sollows, M.C,. 2009. NBM Science Collections databases: Coccinellid & Cerambycid Beetles. New Brunswick Museum, Saint John NB, download Feb. 2009, 569 recs.
5	Toner, M. 2005. Lynx Records 1996-2005. NB Dept of Natural Resources, 48 recs.
4	Bredin, K.A. 2003. NB Freshwater Mussel Fieldwork. Atlantic Canada Conservation Data Centere, 20 recs.
4	Goltz, J.P. 2001. Botany Ramblings April 29-June 30, 2001. N.B. Naturalist, 28 (2): 51-2. 8 recs.
4	Klymko, J.J.D. 2012. Odonata specimens & observations, 2010. Atlantic Canada Conservation Data Centre, 425 recs.
4	Marshall, L. 1998. Atlantic Salmon: Southwest New Brunswick outer-Fundy SFA 23. Dept of Fisheries & Oceans, Atlantic Region, Science. Stock Status Report D3-13. 6 recs.
4	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.
4	Pike, E., Tingley, S. & Christie, D.S. 2000. Nature NB Listserve. University of New Brunswick, listserv.unb.ca/archives/naturenb. 68 recs.
4	Sabine, D.L. 2011. Dorcas Copper records from 2001 Fieldwork. New Brunswick Dept of Natural Resources, 4 recs.
3	Basquill, S.P. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre, Sackville NB, 69 recs.
3	Blaney, C.S. Miscellaneous specimens received by ACCDC (botany). Various persons. 2001-08.
3	Blaney, C.S.; Mazerolle, D.M. 2011. Fieldwork 2011. Atlantic Canada Conservation Data Centre. Sackville NB.
3	Brunelle, P.-M. 2005. Wood Turtle observations. Pers. comm. to S.H. Gerriets, 21 Sep. 3 recs, 3 recs.
3	Clayden, S.R. 2006. Pseudevernia cladonia records. NB Museum. Pers. comm. to S. Blaney, Dec, 4 recs.
3	Forbes, G. 2001. Bog Lemming, Phalarope records, NB. , Pers. comm. to K.A. Bredin. 6 recs.
3	Kennedy, Joseph. 2010. New Brunswick Peregrine records, 2009. New Brunswick Dept Natural Resources, 19 recs (14 active).
3	Klymko, J.J.D. 2012. Insect fieldwork & submissions, 2011. Atlantic Canada Conservation Data Centre. Sackville NB, 760 recs.
3	Lautenschlager, R.A. 2005. Survey for Species at Risk on the Canadian Forest Service's Acadia Research Forest near Fredericton, New Brunswick. Atlantic Canada Conservation Data Centre, 6. 3 recs.
3	Litvak, M.K. 2001. Shortnose Sturgeon records in four NB rivers. UNB Saint John NB. Pers. comm. to K. Bredin, 6 recs.
3	Webster, R.P. & Edsall, J. 2007. 2005 New Brunswick Rare Butterfly Survey. Environmental Trust Fund, unpublished report, 232 recs.
2	Bishop, G. 2002. A floristic survey of known & potential sites of Furbish's lousewort. , 18 recs.
2	Chaput, G. 1999. Atlantic Salmon: Miramichi & SFA 16 Rivers. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-05. 6 recs.
2	Edsall, J. 1993. Spring 1993 Report. New Brunswick Bird Info Line, 3 recs.
2	Hay, G.U. 1883. Botany of the Upper St. John. Bulletin of the Natural History Society of New Brunswick, 2:21-31. 2 recs.
2	Layberry, R.A. 2012. Lepidopteran records for the Maritimes, 1974-2008. Layberry Collection, 1060 recs.
2	Sabine, D.L. 2013. Dwaine Sabine butterfly records, 2009 and earlier.
2	Scott, F.W. 1988. Status Report on the Gaspé Shrew (Sorex gaspensis) in Canada. Committee on the Status of Endangered Wildlife in Canada, 12 recs.
2	Toner, M. 2001. Lynx Records 1973-2000. NB Dept of Natural Resources, 29 recs.
2	Walker, E.M. 1942. Additions to the List of Odonates of the Maritime Provinces. Proc. Nova Scotian Inst. Sci., 20. 4: 159-176. 2 recs.
1	Bagnell, B.A. 2003. Update to New Brunswick Rare Bryophyte Occurrences. B&B Botanical, Sussex, 5 recs.
1	Benedict, B. 2006. Argus annotation: Salix pedicellaris. Pers. comm to C.S. Blaney, June 21, 1 rec.
1	Bishop, G. 2012. Field data from September 2012 Anticosti Aster collection trip. , 135 rec.
1	Clayden, S.R. 2005. Confidential supplement to Status Report on Ghost Antler Lichen (Pseudevernia cladonia). Committee on the Status of Endangered Wildlife in Canada, 27 recs.
1	Edsall, J. 1992. Summer 1992 Report. New Brunswick Bird Info Line, 2 recs.

# recs	CITATION
1	Hinds, H.R. 2000. Flora of New Brunswick (2nd Ed.). University New Brunswick, 694 pp.
1	Holder, M. & Kingsley, A.L. 2000. Peatland Insects in NB & NS: Results of surveys in 10 bogs during summer 2000. Atlantic Canada Conservation Data Centre, Sackville, 118 recs.
1	Jessop, B. 2004. Acipenser oxyrinchus locations. Dept of Fisheries & Oceans, Atlantic Region, Pers. comm. to K. Bredin. 1 rec.
1	Jolicoeur, G. 2008. Anticosti Aster at Chapel Bar, St John River. QC DOE? Pers. comm. to D.M. Mazerolle, 1 rec.
1	Kennedy, Joseph. 2010. New Brunswick Peregrine records, 2010. New Brunswick Dept Natural Resources, 16 recs (11 active).
1	Madden, A. 1998. Wood Turtle records in northern NB. New Brunswick Dept of Natural Resources & Energy, Campbellton, Pers. comm. to S.H. Gerriets. 16 recs.
1	McAlpine, D.F. & Cox, S.L., McCabe, D.A., Schnare, J.-L. 2004. Occurrence of the Long-tailed Shrew (Sorex dispar) in the Nerepis Hills NB. Northeastern Naturalist, vol 11 (4) 383-386. 1 rec.
1	Norton, Barb. 2010. Personal communication concerning Botrychium oneidense near Ayers Lake, NB. , One record.
1	Olsen, R. Herbarium Specimens. Nova Scotia Agricultural College, Truro. 2003.
1	Sabine, D.L. & Goltz, J.P. 2006. Discovery of Utricularia resupinata at Little Otter Lake, CFB Gagetown. Pers. comm. to D.M. Mazerolle, 1 rec.
1	Sabine, D.L. 2004. Specimen data: Whittaker Lake & Marysville NB. Pers. comm. to C.S. Blaney, 2pp, 4 recs.
1	Singleton, J. 2004. Primula mistassinica record for Nashwaak NB. Pers. comm. to C.S. Blaney, 1 rec.
1	Taylor, Eric B. 1997. Status of the Sympatric Smelt (genus Osmerus) Populations of Lake Utopia, New Brunswick. Committee on the Status of Endangered Wildlife in Canada, 1 rec.
1	Toner, M. 2005. Listera australis population at Bull Pasture Plains. NB Dept of Natural Resources. Pers. comm. to S. Blaney, 8 recs.
1	Toner, M. 2009. Wood Turtle Sightings. NB Dept of Natural Resources. Pers. comm. to S. Gerriets, Jul 13 & Sep 2, 2 recs.
1	Toner, M. 2011. Wood Turtle sighting. NB Dept of Natural Resources. Pers. com. to S. Gerriets, Sep 2, photo, 1 rec.
1	Torenvliet, Ed. 2010. Wood Turtle roadkill. NB Dept of Transport. Pers. com. to R. Lautenschlager, Aug. 20, photos, 1 rec.

APPENDIX E:

Zoning Map


19 76
TOWN OF NACKAWIC
Schedule A
Town of Nackawic
Zoning Map
REGIONAL SERVICE COMMISSION 11
COMMISSIONS DE SERVICES RÉGIONAUX
New Nouveau Brunswick
Prepared by Regional Service Commission 11
Produced by Jonathan Dixon
Verified by Dallas Gillis
For the original map, please refer to the office
of the registrar or service commission
March 2017
0 0.25 0.5 1 1.5
kms
Scale 1:8,000
N
W
E
S
Nackawic Stream
Culliton Cove
Saint John River
Zoning
Single-Family Residential
Multiple-Family Residential
Mobile Home
Core-Area Commercial
Industrial
Highway Commercial
Institutional
Public Recreation
Private Recreation
Well Field Protection Area
Rural

APPENDIX F:

Correspondence with the Department of Fisheries and Oceans

Fisheries and Oceans Canada | Pêches et Océans Canada

Fish and Fish Habitat Protection Program
343 Université Avenue
P.O. Box 5030
Moncton, New Brunswick
E1C 9B6

OCT 30 2019

Provincial file
47233'19

Our file
19-HGLF-00315

Mr. Justin Christie and Mr. Daniel Glenn
Glenn Group Ltd.
248 Brunswick Street
Fredericton, New Brunswick
E3B 1G9

Subject: [Nackawic Stream – Tributary to Saint John River – Nackawic Marina – Application for Authorization under the *Fisheries Act* Required, but Prohibited Effects on Listed Aquatic Species at Risk Are Not Likely.

Dear Mr. Christie and Mr. Glenn:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on September 23, 2019. We understand that you propose to:

- Dredge an area of 1735 m^2 in Nackawic Stream/Saint John River to an average excavation depth of 1.8 m;
- Construct a concrete wharf with a footprint of 360 m^2 under the ordinary high water mark;
- Construct an articulated concrete block boat ramp with a footprint of 390 m2 under the ordinary high water mark;
- Stabilize 21 m length of shoreline to a height of 1.1 m;
- Conduct on-land construction activities including buildings and paving.

Our review considered the following information:

- The *Watercourse and Wetland Alteration* Permit application package for file 47233'19.

Your proposal has been reviewed to determine whether it is likely to result in:

- The death of fish by other means than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*;
- Effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*;

The aforementioned impacts are prohibited unless authorized under their respective legislation and regulations.

Based on the review of the above information, the Program has concluded that the following work, undertaking or activity is likely to result in the harmful alteration, disruption or destruction of fish habitat:

- Construction of the wharf and boat ramp and infill with rip rap for shoreline stabilization will result in the destruction of fish habitat;
- Dredging of the substrate will result in both the alteration of the habitat by potentially changing the substrate composition and the disruption of fish habitat while dredging activities are underway.

Your proposal requires authorization pursuant to paragraphs 34.4(2)(b) and/or 35(2)(b) of the *Fisheries Act* in order to proceed. As your proposal will not result in prohibited effects on listed aquatic species at risk, no permit will be required under the *Species at Risk Act*.

Please submit the following information and documents to apply for a *Fisheries Act* authorization:

- a completed Application for Authorization under Paragraph 34.4(2)(b) and/or 35(2)(b) of the *Fisheries Act* Form http://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/forms-formes/apply-auth-applique-eng.pdf;
- the required information and documentation set out in the *Authorizations Concerning Fish and Fish Habitat Protection Regulations* (http://laws-lois.justice.gc.ca/eng/regulations/SOR-2013-191/page-1.html); and
- an irrevocable letter of credit (for requirements see: https://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/applicants-guide-candidats-eng.html#132 to cover the cost of offsetting plan, if you are required to provide one as set out in subsection 2(2) of the Regulations.

Should you choose to relocate or redesign your proposal, this could reduce the potential impacts of your proposal to a level where the aforementioned prohibited effects to fish and fish habitat can be avoided and an authorization under the *Fisheries Act* would no longer be required. If you choose to modify your proposal to avoid a need for authorization, please submit your revised Request for Review form.

.../3

Please be advised that any unauthorized work, undertaking or activity that violates sections 34.4 and 35 of the *Fisheries Act*, sections 32, 33 and/or subsection 58(1) of the *Species at Risk Act*, could lead to corrective action such as enforcement.

If you have any questions with the content of this letter, please contact Mr. Ian Luddington at our Moncton office at (506) 851 4879, or by email at Ian.Luddington@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Bryan Hulbert
Team Lead, Regulatory Reviews
Fish and Fish Habitat Protection

Cc. Wawa @gnb.ca (NBELG)
Frank Parent (NBELG)

APPENDIX G:

Correspondence with Transport Canada

From: Maillet, Marc <Marc.Maillet@tc.gc.ca>
Sent: January-10-20 10:30 AM
To: Chantal Drost
Subject: RE: Nackawic

Hi Chantal,

Yes, you'll have to do either of the options listed below:

You will be required to log into your account NPP on-line site once you've completed your public notice requirements to enter the date the notice will appear in the medium above (date can't be in the past);

OR

As noted above, you will be required to contact this office (NPPATL-PPNATL@tc.gc.ca/ 506-851-3113) once you've completed your public notice requirements to notify NPP of the date the notice will appear in the medium above (date can't be in the past).

I guess you've notified me but you can try to log onto our site and post the date there if you wish. Regarding the pictures as proof of notice (pictures), you can send those to myself so I can add them to the file.

Thanks,

Marc Maillet

Navigation Protection Program
Transport Canada / Atlantic Region / Heritage Court, P.O. Box 42, Moncton, N.B. E1C 8K6 |
506-378-4860
marc.maillet@tc.gc.ca

Programme de la protection de la navigation
Transports Canada / Région de l'Atlantique / Place Héritage, C.P. 42, Moncton, N.-B. E1C 8K6
506-378-4860
marc.maillet@tc.gc.ca

Transport Canada Transports Canada Canada

From: Chantal Drost [mailto:chantal.drost@royconsultants.ca]
Sent: Friday, January 10, 2020 9:19 AM
To: Maillet, Marc <Marc.Maillet@tc.gc.ca>
Subject: Nackawic

Hi Marc,
I sent the template to Randy Wilson and he said he plans on getting it published in the newspaper on January 22, 2020 (he will also be putting the sign up that day as well). I told him to send me pictures of both. Do I need to go online and put the publication date somewhere?

Thanks for your help!

Chantal Drost, IS/EIT
ingénieur stagiaire ENVIRONMENTAL Engineer-in-Training

T. : 506.472.9838 • P/E : 2401 • C. : 506.999.2730 • F. : 506.548.2207
416, rue York Street, Suite 220 • Fredericton (NB) E3B 3P7
chantal.drost@royconsultants.ca • www.royconsultants.ca

ROY CONSULTANTS
ENGINEERING SERVICES D'INGÉNIERIE

From: Chantal Drost
Sent: January-08-20 3:51 PM
To: Maillet, Marc
Subject: RE: Nackawic Marina Development

Perfect, thanks Marc!

Chantal Drost, IS/EIT
ingénieur stagiaire ENVIRONMENTAL Engineer-in-Training

T. : 506.472.9838 • P/E : 2401 • C. : 506.999.2730 • F. : 506.548.2207
416, rue York Street, Suite 220 • Fredericton (NB) E3B 3P7
chantal.drost@royconsultants.ca • www.royconsultants.ca

ROY CONSULTANTS
ENGINEERING SERVICES D'INGÉNIERIE

From: Maillet, Marc [mailto:Marc.Maillet@tc.gc.ca]
Sent: January-08-20 3:50 PM
To: Chantal Drost <chantal.drost@royconsultants.ca>
Subject: RE: Nackawic Marina Development

Hi Chantal,

Here are the templates you should be referring to. I've added our address in there.

Marc Maillet

Navigation Protection Program
Transport Canada / Atlantic Region / Heritage Court, P.O. Box 42, Moncton, N.B. E1C 8K6 |
506-378-4860
marc.maillet@tc.gc.ca

Programme de la protection de la navigation
Transports Canada / Région de l'Atlantique / Place Héritage, C.P. 42, Moncton, N.-B. E1C 8K6
506-378-4860
marc.maillet@tc.gc.ca

Transport Canada Transports Canada Canada

From: Chantal Drost [mailto:chantal.drost@royconsultants.ca]
Sent: Wednesday, January 08, 2020 3:02 PM
To: Maillet, Marc <Marc.Maillet@tc.gc.ca>
Subject: RE: Nackawic Marina Development

Perfect, thanks Marc! I will let you know when the newspaper notice is published and the sign is put in place.

Chantal Drost, IS/EIT
ingénieur stagiaire ENVIRONMENTAL Engineer-in-Training

T. : 506.472.9838 • P/E : 2401 • C. : 506.999.2730 • F. : 506.548.2207
416, rue York Street, Suite 220 • Fredericton (NB) E3B 3P7
chantal.drost@royconsultants.ca • www.royconsultants.ca

ROY CONSULTANTS

ENGINEERING SERVICES D'INGÉNIERIE

From: Maillet, Marc [mailto:Marc.Maillet@tc.gc.ca]
Sent: January-08-20 2:49 PM
To: Chantal Drost <chantal.drost@royconsultants.ca>
Subject: RE: Nackawic Marina Development

Hi Chantal,

Given that I asked signage be posted at the site, it will be required.

For example, it can be as simple as placing a laminated copy of template I provided either on a nearby power pole or by planting a stick in the ground and attaching it there.

I understand that the town has done more than their share of advertising for the project but these requirements come from the Canadian Navigable Waters Act (CNWA Act) and must be adhered to in order for an approval to be issued. (Public posting is explained under the CNWA Act Sec. 7(2) and (3)). This ensures that the public can comment during a period of 30 days, but more importantly we (Navigation Protection Program) can monitor those complaints and ensure that they've been resolved in order for the project to proceed.

What I advise is, that once the notice has been published in the paper and on site, send a picture to myself so I can add them to the file indicating that it's been completed.

Once this public notice period is complete and the 30 days has lapsed (depending if any complaints were received or not) you should not need to do anything else, if you do, I'll reach out to you.

Shortly thereafter, the process will continue for approval. Unfortunately, I can't give you a definitive answer on the approval but it shouldn't take much longer after the comment period.

Should you have any other questions, don't hesitate to ask!

Thank you,

Marc Maillet

Navigation Protection Program
Transport Canada / Atlantic Region / Heritage Court, P.O. Box 42, Moncton, N.B. E1C 8K6 |
506-378-4860
marc.maillet@tc.gc.ca

Programme de la protection de la navigation
Transports Canada / Région de l'Atlantique / Place Héritage, C.P. 42, Moncton, N.-B. E1C 8K6
506-378-4860
marc.maillet@tc.gc.ca

Transport Canada Transports Canada Canada

From: Chantal Drost [mailto:chantal.drost@royconsultants.ca]
Sent: Wednesday, January 08, 2020 12:33 PM
To: Maillet, Marc <Marc.Maillet@tc.gc.ca>
Subject: RE: Nackawic Marina Development

Hi Marc,
I just spoke with the client and we will be publishing a notice in the newspaper. I know you said you suggested signage at the site, is this a requirement or a suggestion? The Town of Nackawic has already been promoting and advertising the waterfront development plan for the last couple of years. With our public consultation process approved by DELG, the publication in the newspaper, and available hard copies of the EIA located at Town Hall and the DELG office in Fredericton, I thought maybe we wouldn't need the sign. However, if this is an absolute requirement we will provide a sign at the site as well.

Once I provide the publication date online, is there anything else I have to do for the approval process? The Town plans on starting construction during a planned drawdown period by NB Power in May, do you think we will have approval by then?

Just trying to get familiar with the approval process under Transport Canada as I haven't gone through the process before.

Thank you!

Chantal Drost, IS/EIT
ingénieur stagiaire ENVIRONMENTAL Engineer-in-Training

T. : 506.472.9838 • P/E : 2401 • C. : 506.999.2730 • F. : 506.548.2207
416, rue York Street, Suite 220 • Fredericton (NB) E3B 3P7
chantal.drost@royconsultants.ca • www.royconsultants.ca

ROY CONSULTANTS
ENGINEERING SERVICES D'INGÉNIERIE

From: Maillet, Marc [mailto:Marc.Maillet@tc.gc.ca]
Sent: January-02-20 1:52 PM
To: Chantal Drost <chantal.drost@royconsultants.ca>
Subject: RE: Nackawic Marina Development

Hi Chantal,

I've read your email and understand why you would ask that very valid question.

That being said and to explain further, under that Canadian Navigable Waters Act, your application was found to meet the elements of Section. 10(1)(a) which is a work in a navigable water that is not listed in the scheduled waters. In Section. 10(2), it states that an application made under paragraph (1)(a) is deemed to be an application made under Section. 5(1) (A Major Work or Work within a scheduled water) so they fall within those same requirements. In order to get an approval under Section. 7(6) one of the conditions states in Section. 7(3) that the owner must publish a notice containing any information specified by the Minister in any manner specified by the Minister.

All this means is that the information must made publicly available in a consistent manner for members of the general public to be able to comment.

I believe it would be best to follow the guidelines I provided which are to: **Post at the site and in a local newspaper** using the templates attached previously.

One of the reasons we ask to follow the guidelines is because on the templates we provide, it indicates to members of the public where and how they can comment. (Such as going onto the Common Project Search Site). This makes us (Navigation Protection Program) aware of any comments that the public would have made on the project. Also with this method, it is reasonably expected that any general member of the public can access the information and comment on it as not all people will use the Town of Nackawic website, go see the EIA hardcopy at the Nackawic Town Hall or in the Fredericton DELG Office.

I hope this helps clarify things but should you have any other questions, don't hesitate to contact me.

Thank you and Happy New Year,

Marc Maillet

Navigation Protection Program
Transport Canada / Atlantic Region / Heritage Court, P.O. Box 42, Moncton, N.B. E1C 8K6 |
506-378-4860
marc.maillet@tc.gc.ca

Programme de la protection de la navigation
Transports Canada / Région de l'Atlantique / Place Héritage, C.P. 42, Moncton, N.-B. E1C 8K6
506-378-4860
marc.maillet@tc.gc.ca

Transport Canada Transports Canada Canada

Canadian Navigable Waters Act

The Town of Nackawic hereby gives notice that an application has been made to the Minister of Transport, pursuant to the *Canadian Navigable Waters Act* for approval of the work described herein and its site and plans.

Pursuant to paragraph 7(2) of the said Act, The Town of Nackawic has deposited with the Minister of Transport, on the on-line Navigable Waters Registry (http://cps.canada.ca/) and under registry number 510, or, under the NPP File Number 2019-201518 a description of the following work, its site and plans:

Proposed Nackawic waterfront marina on the Saint John River, in behind of the civic address 152 Otis Drive, Nackawic, New Brunswick.

Comments regarding the effect of this work on marine navigation can be sent through the Common Project Search site mentioned above under the Comment section (search by the above referenced number) or, if you do not have access to the internet by sending your comments directly to:

Manager, Navigation Protection Program
P.O. Box 42,
95 Foundry Street,
Moncton, New Brunswick
E1C 8K6

However, comments will be considered only if they are in writing (electronic means preferable) and are received not later than 30 days after the publication of the last notice. Although all comments conforming to the above will be considered, no individual response will be sent.

Signed at Nackawic, this 22nd day of, 2020

Randy Wilson - CAO