

Stewart Vertical Farms Inc.

Environmental Impact Assessment Registration Document St. Stephen, NB

Prepared by:

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Revision #	Date	Revised By:	Revision Description
1	2016-07-14	AECOM	Final

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Executive Summary

Stewart Farms proposes the development of an aquaponics operation in St. Stephen, New Brunswick that will produce 200 metric tonnes (MT) of tilapia fish and 1,000 MT of plant produce (produce) per year at full production. The closed loop system will raise tilapia within indoor tanks and extract nutrients from the fish waste by-products to feed plants that will be grown in vertical growing beds using light spectrum optimized LED lighting. The facilities will be constructed on a developed property in an industrial area of St. Stephen that provides municipal water and waste water services. An existing building will be upgraded to host the aquaponics facilities. The construction phase of operations will include a clean-up of the existing property, modifications to the existing building and construction of facilities within the building. The facilities will be divided into a produce section and fish production area. The fish will be raised in tanks with a circulation system that will extract nutrients to be used for produce production. The water supply of the fish production will be from the Town of St. Stephen water supply. No waste water from the fish and produce production will be discharged to the municipal waste water system or surface water features. Produce will be provided with nutrients from the fish production and lighting will be provided by LED fixtures.

The property containing the facilities is a developed site that was previously used for manufacturing. The property is graded and enclosed with a chain link fence. The site is a developed industrial property with adjacent industrial properties to the north, west and east. The area south of the site is undeveloped forest and a watercourse (Doodle Brook) is located north of the fence-enclosed portion of the site. There are no critical or sensitive habitats located on the site. There are three significant areas within a 5 km radius of the site. The St. Croix River Estuary and the Dennis Stream area are located approximately 2.5 km to the east of the site. The Kendricks Lake area is located approximately 4.5 km to the north of the site.

The production facilities will be operated within a building structure with discharges to the environment that include water vapour and heat.

Accidental release of tilapia fish to watercourses or water bodies is a risk that requires specific mitigation to ensure the prevention of impacts to aquatic ecosystems. Two types of mitigation will be used at the facilities; physical barriers to prevent tilapia release and the temperature of the potential receiving waters. The physical barriers of the operations will be effective at preventing the accidental release of tilapia to water courses or water bodies. The risk of accidental release of fish to water courses or water bodies is low considering the planned mitigation measures. The potential impacts of any release are expected to be minimal considering the fish cannot reproduce at temperatures below 22°C, they do not eat in water temperatures below 20°C and die in water temperatures less than 12°C. The temperature of the surrounding water bodies would prevent long term survival of tilapia.

Stewart Farms have completed community and public engagement to inform the public of the project and to seek input on the project.

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1. Introduction

Stewart Vertical Farms Limited (Stewart Farms, the Proponent) proposes to develop and operate an aquaponics facility to raise tilapia and grow plant crops (herein referred to as produce) in an existing building in St. Stephen, New Brunswick (**Figure A-1, Appendix A**). The stock of tilapia fish to be raised at the Stewart Farms facility are from stock collected from Lake Nasser in Southern Egypt in 1994. The tilapia fish are not indigenous to New Brunswick and the raising of tilapia requires the Project to be registered with the Sustainable Development, Planning and Impact Evaluation Branch (SDPIEB) of the Department of Environment and Local Government (DELG) pursuant to the New Brunswick Environmental Impact Assessment Regulation, Schedule A:

- (l) *programs or commercial ventures involving the introductions into New Brunswick of plant or animal species which are not indigenous to New Brunswick*

This Registration Document serves as the formal filing required to support a Determination Review by Technical Review Committee (TRC) to determine whether or not a Comprehensive Review is warranted by DELG.

1.1 Proponent Information

Name of Proponent: Stewart Vertical Farms Limited

Address of Proponent: 22644 112th Avenue, Edmonton, Alberta, T5S 1Y5

Chief Executive Officer: Tanner Stewart

Principal contact for Environmental Impact Assessment purposes: Robert Taylor

Stewart Vertical Farms is led by the President and CEO, Tanner Stewart and supported Robert Taylor, Chief Aquaculturalist and Derek Rolston, Chief Design Officer. Stewart Farms is a business that was incorporate in 2016 to implement aquaponics operations that have been developed by NutraPonics. Stewart Farms holds a licensing agreement with NutraPonics to use the technology and methods developed by NutraPonics.

The property used for the aquaponics operations is owned by Terra-NB Holdings Inc. and is leased to Stewart Vertical Farms. Written consent from the property owner is included in **Appendix B**.

2. The Undertaking

2.1 Project Overview

The Proponent proposes the development and operation of an indoor 23,560 m² vertical farm aquaponics facility that will produce 200 metric tonnes (MT) of fish and 1,000 MT of produce per year at full production. The closed loop system will raise tilapia within indoor tanks and extract nutrients from the fish waste by-products to feed plants that will be grown in vertical growing beds using light spectrum optimized LED lighting. The system and methods

have been developed into a proprietary technology called NutraPonics that has been implemented near Edmonton, Alberta for the past 4 years. A schematic representation of the aquaponics system is shown on **Figure 1**.

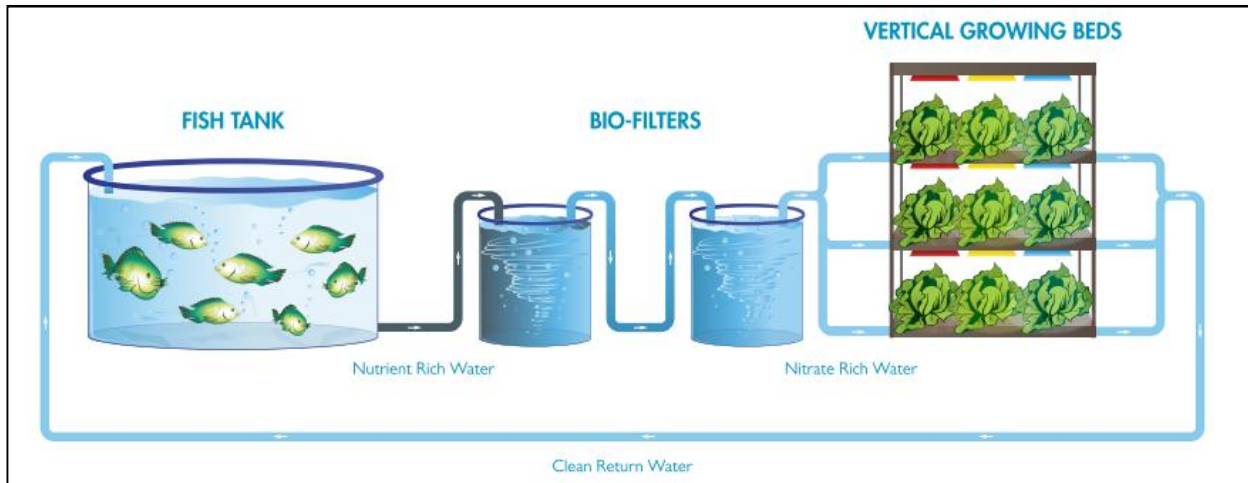


Figure 1: Simplified aquaponics process

The St. Stephen facility will be constructed within an existing commercial building without altering the existing footprint of the property. Water will be supplied by the Town of St. Stephen municipal water services. Solid waste from the fish tanks will be collected and disposed of at the local landfill or used to produce compost for distribution and sale. The closed loop fish and plant production system will be designed to eliminate the production of waste water from the operations of the aquaponics systems. Waste water produced by the facility will be limited to domestic waste and water used for regular cleaning of the facilities. Juvenile fish will be sourced from a facility in New Mexico, USA that is a regular supplier of tilapia fish to Canadian facilities. All of the fish that will be supplied to the facilities will be male fish. Once the fish have grown large enough for harvest, the live fish will be shipped from the facility by road transport to market in the north eastern USA. Plants (produce) grown at the site at the facilities will include micro greens (e.g. lettuce, arugula, kale chard), herbs (e.g. cilantro, basil, mint), vegetables (e.g. beans, cucumber, peppers), stevia and fruit (e.g. melons, strawberries, cherry tomatoes). The plant produce will be sold locally and distributed using grocery chains and their suppliers.

At full production the facility is expected to employ 65 full time staff to operate and maintain the facility and harvest crops.

2.2 Purpose/Rationale/Need for the Undertaking

The purpose of the Project is to develop an industrial scale application of NutraPonics technology to produce fish and plant crops. The indoor farming system will recycle water inputs and reduce the quantity of water required to produce crops. The growing density of the system is higher than the growing capacity per square unit of space common in hydroponic greenhouses. The use of tilapia waste to feed the plant crops is an efficient use of feed and nutrients to create pesticide free and organic produce. The growing system will provide high quality food grown using relatively small building footprint while producing minimal waste.

2.3 Project Location

The site for the Stewarts Farms Aquaponics operation is located in the Town of St. Stephen, Charlotte County, New Brunswick (**Figure A-1, Appendix A**). Coordinates for the site are 0632749, 5004323 (NAD83 UTM Zone 19) or 45.17963 °N, -67.31041 °E (Latitude and Longitude). It is located less than 3 km northwest of the border with the United States of America. The site is located in the Town of St. Stephen Business Park at the civic address 30 Progress Drive (PID 01332683). The Business Park is a commercially zoned area approximately 5 km from the centre of the Town of St. Stephen. The Business Park is home to commercial and industrial businesses including a particle board manufacturing facility, fabricators, recycling and tank storage facilities.

Road transportation access from the TransCanada Highway 1 to the site is less than 2 km on asphalt paved roadways. Progress Drive is a paved two lane road that can accommodate large/heavy vehicular traffic. Approximately 500 m from the site, Progress Drive connects to secondary Highway 725. Highway 725 connects to the TransCanada Highway 1 less than 1 km from the intersection of Highway 725 and Progress Drive.

The site is a developed industrial property with adjacent industrial properties to the north, west and east. The area south of the site is undeveloped forest and a watercourse (Doodle Brook) is located north of the fence-enclosed portion of the site (**Figure A-2, Appendix A**)

2.4 Siting Considerations

Factors that were considered in the selection of St. Stephen, New Brunswick as the site for the Project include the availability of a suitable existing building and the proximity to large consumer markets.

The building in St. Stephen is an existing structure that provides the dimension and services requirements for operations. The steel structure of the building will accommodate production that will allow for commercial scale production without major construction. The building is located in an existing business park with industrial and commercial operations. Utility services including water, waste water, electricity and natural gas are established at the building and can supply the services required for commercial scale operations.

The use of an existing building removes requirements to construct a new building and prevents potential impacts to environmental and cultural features. The property will be utilized without expanding the footprint of the developed property preventing impacts to natural features. The property is located in a commercially zoned area of St. Stephen that is not within any protected watersheds, protected coastal areas or sensitive habitats. The property is not included in areas of First Nations land claims. The location of the existing developed property avoids potential impacts to the environment and potential land claim issues.

St. Stephen shares a border with Calais, USA and is close to transportation routes to major Canadian cities. The proximity of St. Stephen to the USA and road access to cities in the northeastern USA, such as Boston and New York, provides a large market of consumers. St. Stephen is also easily accessible to large Canadian cities, such as Montreal and Toronto, while being near to New Brunswick cities of Saint John and Fredericton.

2.5 Physical Components and Dimensions of the Project

The primary components associated with the Project include:

- The existing building that will host the production facilities;
- The cleared land on the property; and
- Existing road network for the transportation of products.

The property, existing infrastructure and planned facilities are shown on **Figure A-3, Appendix A**.

Existing building hosting the productions facilities

The building on the property is a steel framed building (8970 m² foot print) with metal clad siding on a concrete slab on grade and the building structure is up to 12.5 m high. The original structure was built in 1974 with additions built on each end. The building is supplied with water and waste water services from the Town of St. Stephen. A 40.6 cm water main, owned and serviced by the Town of St. Stephen, extends on to the Property and provides water to the building via 15.2 cm private water lines. A waste water service line is connected to the northeastern end of the building. Energy is supplied to the building with electricity and natural gas services along Progress Drive.

The building has been used for several industrial purposes including manufacturing of steel casings, production of iron castings and fence production.

The property also includes cleared land including asphalt, gravel and vegetation covered areas inside a secure chain link fence. Within the fenced portion of the property, the site is developed for use of large machinery, trucks and includes areas for material storage. Outside the fenced portion of the property, undeveloped areas include forested area to the west and wetlands to the north, and developed areas for employee parking and landscaped areas.

The site includes access to existing road transportation. The site is accessible from two existing roadway entrances from Progress Drive. Progress Drive is connected to the highway road network of New Brunswick, the rest of Canada and the northeastern portions of United States of America via Calais, Maine. The tilapia fish produced at the site will be transported live to the Boston, Massachusetts area via Highway 9 and Highway 95 in the United States of America. Produce will be shipped using road transportation to local markets.

2.6 Construction Details

The aquaponics facilities will be constructed within the existing building on the property with minimal modifications to the footprint of the building. The construction of the facilities will occur in three stages:

- Stage 1: Property clean up and building stripping;
- Stage 2: Building upgrades; and
- Stage 3: Facilities construction.

Stage 1 is anticipated to begin in the summer of 2016. This stage will include the clean-up of the area within the fenced portion of the property and removal unnecessary materials from the main building. The previous operations at the property stockpiled materials outside the building and within the fenced portion of the property. Stewart Farms will have the materials removed from the property and recycled locally when possible. Materials that cannot be recycled will be disposed of at an appropriate landfill facility. The process of removing materials from the property prior to construction will generate solid waste that will be disposed of off-site at appropriate recycling and

waste disposal facilities. A Phase I environmental site assessment of the property completed in 2013 (Appendix C) did not identify hazardous materials at the property or in the building. If any potentially hazardous waste is identified during the site clean-up and building repair, the materials will be assessed and properly disposed of in a manner appropriate for the materials.

The property also includes small structures that were used in previous operations. Structures that will not be used for the aquaponics operations will be dismantled and disposed of properly.

The main building that will be used for the aquaponics operations will have unnecessary materials removed from the interior and exterior of the building.

The noise and dust generated during the first stage is anticipated to be consistent with the levels common in an industrial work zone. It is not anticipated that this stage of work will generate water or air emissions to the surrounding environment.

Stage 2 will include upgrades to the existing building and infrastructure to accommodate the construction of the aquaponics facilities. The exterior of the building will be repaired and upgraded to ensure the produce and fish will be secure from the variable weather conditions that are typical in the St. Stephen area. This may include insulation and upgrading the exterior, depending on the design and standard requirements. The interior of the building will be upgraded to meet Canadian Food Inspection Agency (CFIA) standards as a food production facility. This may include the installation of ventilation systems, heat and moisture control systems, and floor and interior wall upgrades. Any changes to the water supply and distribution systems will be completed during stage 2. The interior of the building will be segmented by the installation of walls and physical barriers to separate the fish production area from the produce area.

The upgrades to the building are not expected to generate emissions or discharges to the environment other than solid waste produced from the installation of building materials.

Stage 3 of development will involve the construction of the fish and plant produce facilities. Construction will proceed to allow the stocking of juvenile fish while other infrastructure is built. The full scale fish production areas and the produce areas are planned to be worked on simultaneously in the building. A schematic drawing of the facilities layout is included in **Figure A-4, Appendix A**. The facilities will include an approximate 2,500 m² area for fish production with a total of twenty-eight tanks, which include four tanks with 2.81 m³ capacity each, twenty tanks with 7.81 m³ capacity each and eight tanks with 97.32 m³ capacity each. The various volumes of tanks will accommodate the fish as they are raised from juveniles to mature fish.

Separate portions of the facilities will be constructed for production, waste management and packing and shipping. Geotubes constructed of permeable materials will be used to separate solid waste from the fish tanks water. The fish production area will be accessible to the produce area by controlled access points. The produce growing areas will include 3960 individual growing beds (2.44m by 2.44 m) that will be mounted on vertical racks for a total growing area of 23,560m² of production area. The produce area will include separate germinating, cleaning, packaging and shipping areas.

2.7 Operations and Maintenance Details

Operations of the facilities include the procedures and processes used to produce fish and plant produce. Maintenance includes the methods used to ensure that the facilities operate according to plan. The descriptions of the operations and maintenance provided focus on water use, waste management and cleaning to allow an evaluation of consumption of resources and discharges to the environment.

Early operations of the facility will allow for the raising of juvenile fish while the facilities are constructed to accommodate full scale production. Juvenile fish will be stocked for three months until the biomass of the fish is great enough to begin to extract nutrients from the tank water. Once this critical biomass of fish is reached, the nutrients will be extracted to feed the first generations of produce. The scale of operations will increase as fish biomass increases and facilities construction is completed to allow for full scale operations. The rate of increase in production will also be controlled by the demand of the produce market. It is anticipated that produce production will be increased by areas of 6,000 m², as determined by market demand.

Water use and discharge

Water used for rearing fish and providing nutrients to the produce will be in a closed loop system that will have multiple physical barriers preventing discharges from entering watercourses or waterbodies. Water will be supplied by the Town of St. Stephen from an existing water main. Discussions with the Town of St. Stephen operations manager confirm that the water volume needs of the aquaponics facility can be supplied by the Town. Water entering the aquaponics facility and will be initially used in the fish rearing tanks. The use of a closed loop system within the facility will limit the volumes of water required by the facilities. However, water losses through fish growth, plant growth and evaporation will need to be supplied by make-up water from the Town water supply. The anticipated water supply of the facilities at full production is estimated to be a maximum of 130 m³/day. The use of chlorine in the municipal water supply may require chlorine removal via carbon filters prior to use within the fish tanks. The water treatment methods are not expected to create by-products that require specific disposal methods.

Water entering the fish tanks will be maintained by using the Recirculation Aquaculture System (RAS) that filters water from the tanks to remove solids and nutrient waste and then returns the water to the tank. This process cleans the water to maintain the health of the fish and allows the extraction of the dissolved nutrient and solid waste. Solid waste will be filtered from the water. The nutrient rich water from the fish tanks will be processed on site to produce a solution that will be used to supply nutrients to the produce facilities. Water entering the produce area will be used by the plants or recovered and returned to the fish tanks. The produce area will generate water vapour from evaporation. Ventilation and condensation recovery will allow for the re-use of water vapours within the facility. Water vapour not captured within the facility will be discharged to the air of the surrounding environment. The closed loop water system of the facilities will be supplied by the Town of St. Stephen. Water consumption and loss from the facilities will be limited to growth of fish and plants, and discharge of water vapour to the air. Water used in the fish production and the produce production facilities will not be discharged to the municipal waste water system or any watercourses or waterbodies.

The potential for seasonal flooding to affect the facilities is minimal considering the facilities are located in small catchment of Doodle Brook that drains into the St. Croix River. The relatively small area of the catchment, that is upstream of the property, indicates that seasonal flooding of Doodle Brook is unlikely to flood the property and affect operations.

Solid waste

Fish production and produce production will be the sources of solid waste produced at the facilities. Fish will be fed with a locally sourced, certified organic feed that does not contain genetically modified ingredients and does not contain land animal by-products. The solid waste generated by the fish will be captured by drum screen filters and pumped to a geo tube with permeable exteriors. The geo tubes will allow water to drain from the solids and the captured water will be reused in the production facilities. Solid waste produced from the produce facility will be collected and stored on site until it is ready for disposal. The fish and produce solid waste will be disposed of at a Fundy Region Solid Waste Commission facility during the initial stages of the project development. Once the facility is at full production, Stewart Farms plans to manage the solid waste on site and produce compost that will be sold as a fertilizer.

Cleaning

Cleaning of the facilities, including the fish tanks, produce production areas and packaging areas will be completed on a regular basis. Water and products used for facilities cleaning and maintenance will be separate from the production cycles and discharges from cleaning will be directed to the Town of St. Stephen waste water system. The standard operating procedures for the facility will dictate that only bio-degradable cleaning agents will be used to clean the fish and produce areas. The cleaning agents will follow the CFIA regulations related to food and facilities cleaning requirements.

Fish and produce

The stock fish are Nile Tilapia and originated from Lake Nasser in Southern Egypt in 1994. The brood stock was developed by Northern Tilapia that has operated in Ontario for over 20 years. The stock fish will be all male fish and supplied by a facility operated by AmeriCulture Inc. located in Animas, New Mexico. The health of the fish will be maintained at a high level of biosecurity to ensure diseases do not affect the facilities. The stock of fish is from a source that has had no notifiable diseases in 23 years. The Stewart Farms facilities will adopt the fish health management procedures used at the stock source facilities. Regular fish health testing will part of standard operations at the facilities to ensure the methods of fish health procedures are effective at excluding disease from the fish.

All fish and produce raised at the facilities will meet the CFIA requirements for food production and distribution. The fish will be raised until they are 700 to 800 grams at the facilities and will be shipped as whole, live fish to markets. Produce at the facility will be shipped as whole foods for sale. Therefore, no fish processing or produce processing by-products will be created at the facility.

Light sources

The produce area will provide light to the growing plants using energy efficient LED lighting optimized for plant growth. The facilities will utilize electricity provided by NB Power to power operations. Power outages caused by weather events or other environmental factors could have negative impacts on the operations of the facilities. Back-up generators will be in place for the produce area and for the fish production area. The capacity of the generators will be determined based on the anticipated power needs of each section of operations. Any emissions produced by the back-up generators will be limited in duration.

The LED lights used to grow the produce will generate heat within the facilities. Heat generated by the lights will be captured within the facilities by a heat exchange system.

2.8 Future Modifications, Extensions, or Abandonment

Upon completion of construction and full scale operations, the facilities will continue to operate as a permanent business. Stewart Farms has no plans for future modifications, extensions or abandonment. In the event of a required abandonment of the facilities, Stewart Farms will ensure all fish have been removed from the property to an appropriate market, holding area or disposal facility. The outcome of the infrastructure would be negotiated with the property owner and the lease of the building would be terminated. If an unplanned abandonment is required, the products and facilities would not likely create an environmental liability for the Town of St. Stephen or the Province of New Brunswick.

2.9 Project Related Documents

A previously prepared Phase I Environmental Site Assessment is included in **Appendix C** and discussed in Section 3.3 below. No previous Environmental Impact Assessment registrations have been completed for this property. Physical measurements of the property and the building have been completed by Stewart Farms to inform preliminary designs and building layout as shown in **Figures A-3 and A-4, Appendix A**. AECOM completed a site visit to observe the building, property and surrounding environmental conditions and features. Observations from the AECOM site visit have been used to describe the existing environmental conditions in **Section 3 – Description of the Existing Environment**.

The Stewart Farms aquaponics facility requires several permits and licenses for approval to operate. A list of permits, licenses and certifications for operations is provided in **Section 7 – Approval of the Undertaking**.

3. Description of the Existing Environment

3.1 Physical and Natural Features

The site has minor relief and is mostly occupied by an abandoned wood product manufacturing plant. A part of the site is fenced and a building has been constructed on the site. The fenced area occupies 3.99 hectares of the 6.04 hectares of the site. A watercourse is located in the north end of the site and a wetland is located north of the developed portion of the property.

3.1.1 Physical Features

Information used to assess the existing physical features includes publically available information and from observations at the site. Specific studies to collect data to describe existing conditions have not been completed for the Registration Document.

Site topography (elevation and gradient ranges)

The site has been graded and has minor relief in a south-west direction of less than 2 m between the highest points and water drainage features. Surrounding topography is mostly flat at approximately 30 m above sea level (asl) but a hill is located to the south of the site and at its highest is about 100 masl.

Surface drainage regime and surrounding/nearest aquatic features

The site is located in the St. Croix watershed near the discharge of the St. Croix River to the marine waters of Passamaquoddy Bay. The site is in a minor sub-watershed of the St. Croix watershed that contains one named watercourse, Doodle Creek, which discharges to the St. Croix River less than 2 km from the site. The average summer temperatures of the St. Croix River are between 15 and 17 °C and the average winter temperatures range allows for freezing of the river (NB Department of Environment 2007).

The site has drainage ditches that direct surface water flow to the surrounding watercourses and stormwater ditches. On the southwestern side of the building, ditches direct flow to the southwest towards a tributary of Doodle

Brook. Ditches on the northwestern side of the building direct surface water flow to the wetland area north of the building. Surface water flow on the eastern side of the building is directed to stormwater ditches that discharge to Doodle Brook (**Appendix D**).

Geological and hydrogeological features

The site and surrounding area is underlain by igneous rock of the Late Silurian aged St. Stephen Gabbro formation (NBDNR 2005). The bedrock is not exposed at the site and is covered by surficial sediments. The surficial geology of the area is a poorly sorted glacial till generally between 0.5 and 3 m thick (NBDNR 1984).

The site is serviced by the Town of St. Stephen municipal water supply. A search of the New Brunswick Department of Environment Online Well Log System indicates there are no registered potable water wells within 500m of the site. The site is approximately 7 km southwest of the Ruisseau Dennis Stream watershed that is the protected watershed (zone C) of the Town of St. Stephen.

Existing air quality, noise levels.

The site is located in the St Stephen Business Park that includes a particle board production facility and light industry. Considering the lack of heavy industry in the area, the existing air quality is expected to be good. Noise generated in the area is related to road transportation servicing the particle board facility and other existing light industry. The existing noise levels are considered moderate.

3.1.2 Natural Features

A field visit was done on April 1, 2016. During the field visit the natural features on and near the site were surveyed. The observations from the field visit are supplemented with information from the New Brunswick Service GeoNB online geographic information supplier (Service NB 2016). The Atlantic Canada Conservation Data Centre (ACDC) provided a data report, included as **Appendix E**, which includes any rare and endangered species and special areas near the site.

The site is located in the Southern New Brunswick Uplands ecoregion of the Atlantic Maritime ecozone (Environment and Climate Change Canada 2016). Mixed wood dominates the region and is characterized by sugar and red maple, white and red spruce and balsam fir. Conifers tend to dominate in the lower elevations.

Vegetation observed on the site includes: small deciduous vegetation such as blackberry bushes, alders and shrubs; grasses and reeds; and small coniferous trees such as pine and spruce. In the undeveloped areas surrounding the site vegetation includes birch, pine, spruce, maple, alders, sumac, tamarack and cedar among others (**Appendix D**). This variety of vegetation is consistent with the Southern New Brunswick Uplands ecoregion lower elevations.

A wetland area is located north of the building in the fenced portion of the property. It is 1.86 hectares in size. Vegetation in the wetland area includes cat tails and grasses (**Appendix D**). The wetland area is identified as marsh in the NB wetland database (Service NB 2016). The wetland is not considered a Provincially Significant Wetland but is located on the property that contains the developed portion of the site.

According to the New Brunswick Nature Trust (2016) there are no environmentally significant areas on the site or within 500 m.

Wildlife

The region provides habitat for moose, black bear, white-tail deer, red fox, snowshoe hare, porcupine, fisher, coyote, beaver, ruffed grouse, bobcat, muskrat and red squirrel. According to the ACCDC data, many birds are found in the area around the site. The marsh located on the site is also good habitat for ducks and amphibians.

The ACCDC report (**Appendix E**) identifies 375 records of vascular flora, 121 records for vertebrates' and 3 records for invertebrate fauna within a 5 km radius of the site. All these records are of rare or endangered species. However, none of the records of these species are located on the site. The nearest species identified, Bicknell's Crane's-bill (*Geranium bicknellii*), is located 0.3 km to the north of the site. It is a vascular plant that grows in open forests and fields. The Bicknell's Crane's-bill is not listed in Species at Risk Act, schedule I (Species at Risk Public Registry 2016).

According to the ACCDC report, there is no critical or sensitive habitats located on the site. There are three significant areas within a 5 km radius. The St. Croix River Estuary and the Dennis Stream area are located approximately 2.5 km to the east of the site. The Kendricks Lake area is located approximately 4.5 km to the north of the site.

3.2 Cultural Features

The Town of St. Stephen is a community of approximately 5,000 residents located along the St. Croix River and adjacent to Calais, Maine. Tourism, recreational and cultural features are important to the character and economy of the community. The Canada and United States of America border crossing is one of the busiest border crossings in New Brunswick (Tourism NB 2016). St. Stephen is the location of Canada's oldest candy company and a Chocolate Museum. St. Stephen includes indoor and outdoor recreational facilities including the Garcelon Civic Centre in downtown St. Stephen, the Border Area Community Arena, Dover Hill Park and the Ganong Nature Park (Town of St. Stephen 2016). The downtown area of St. Stephen is home to many of the tourist, recreational and cultural features of the area. The project site is physically removed from the downtown area of St. Stephen and is located approximately 2.5 km from the downtown area.

3.3 Existing and Historic Land Uses

A Phase I Environmental Site Assessment (ESA) was completed in 2012 by Fundy Engineering (2012) and provides information on the site history, surrounding properties and any potential environmental concerns related to historic land use (**Appendix C**). According to the Phase I ESA, the building located on the site was constructed in 1974 by Atwood Morell. Stainless steel casings were fabricated at the site from 1974 to 1978, at which time Texas Steel's acquired the property to produce steel castings. Between 1978 and 1982, a fire destroyed parts of the building. When it was reconstructed the building was expanded. The St. Stephen Foundry acquired the property in 1984 to manufacture iron castings and was in operation until 1987. After the foundry closed its operations the building was used as a warehouse until 1998. At that time SWP industries bought the property and converted it to enable fence production.

Aerial photographs included in the Phase I ESA indicate the footprint of the site was developed to the current layout and extent by 2010. The extent of the footprint includes the clearing, grading and fencing up to the wetland area north of the building. This layout is consistent with observations from the AECOM 2016 site visit.

The surrounding properties are a mixture of developed and undeveloped commercial land. The adjacent property to the north is a Government Garage Compound used as a District Highway Office owned by New Brunswick

Department of Transportation and Infrastructure. Immediately to the west of the site is a property that was historically part of the operations at the site. It is an undeveloped property that has had periodic use associated with the industries that have occupied the site. Currently the site is vacant and owned by Terra-NB Holdings Inc. Further north, there is Flakeboard Company Ltd. near Church Street and St. Stephen Drive. A machine shop and fabricator shop are located across Progress Drive to the south east of the site. Immediately to the southeast of the Site is a property used as a storage facility.

According to the Phase I ESA there are no actual environmental concerns related to historic land use and activities at the site. The Phase I ESA identifies nine potential environmental liabilities associated with historical land use, above ground storage tanks, above ground chemicals, waste management, polychlorinated biphenyls (PCBs), asbestos containing materials (ACMs), ozone depleting substances (ODSs), lead based paints, watercourses and hydraulic equipment. The potential liabilities are not considered significant, immediate concerns and are not anticipated to affect the Stewart Farms operations.

4. Summary of Environmental Impacts

The construction phase of the project will be completed in compliance with relevant legislation, policies and standards related to the regulation of impacts to the environment. The facilities will be constructed on the existing footprint of the property utilizing existing road and municipal services infrastructure. The facilities will be constructed within the existing building with limited modifications to the footprint and structure of the building. The construction phase will produce solid waste from renovations and upgrade of the building. This will require the use of machinery that will produce emissions from gasoline or diesel powered engines. The solid waste and emissions produced during the construction phase are expected to be minimal in volume and will occur during a limited duration. The construction phase is not anticipated to produce significant discharges or emissions to the surrounding environment.

The operations of the project will be completed in compliance with the relevant legislation, policies and standards related to the regulation of impacts to the environment. Anticipated discharges and emissions from the site during regular operations include waste water discharge from cleaning and maintenance of the facilities, water emissions to the air, methane gas from decomposition of organic waste and heat to the surrounding environment from lighting.

The waste water produced by the cleaning and maintenance of the facility will be discharged to the Town of St. Stephen waste water treatment facilities. The operations of the facilities are not anticipated to produce any waste water or waste that will be directly discharged to watercourses or waterbodies.

The fish tanks and produce operations will result in evaporation of water from the fish tanks and from supplying water to the produce. A portion of the water will be collected in the air treatment systems of the facility, but a portion of the water vapour will be emitted to the surrounding environment. There are not any negative environmental impacts anticipated from the emission of water vapour to the surrounding environment.

Once full capacity of the facilities is reached, Stewart Farms plans to compost the solid waste generated by the fish waste and the produce production. The decomposition of solid waste on site will likely generate methane gas that will be emitted to the surrounding environment. Methane gas is a greenhouse gas that contributes to climate change. The volume of methane generated by the facilities is anticipated to be comparable to other industrial agricultural activities. The odours generated by the decomposition of the solid waste is unlikely to have a negative

impact on residents in the area because of the facilities are located in an industrial area separate from residential areas.

The use of LED lights to grow produce will generate heat in the facilities. Some of the heat will be recovered in the facilities, but some of the heat will be emitted to the surrounding environment. It is not anticipated that the heat emitted from the facilities will have a negative impact on the surrounding environment.

The tilapia fish that will be raised at the facilities are a species of fish that are not native to the surface water courses and water bodies of New Brunswick. The accidental release of tilapia to waterbodies or watercourse could have negative impacts to the fresh water systems of the area. Mitigations to prevent the accidental release of tilapia to watercourses and waterbodies will be included as part of the operations of the facilities and are described in the section below.

The environmental impacts of the construction of the facilities, the waste water discharge to the municipal waste water system, water vapour to the surrounding environment, methane production from decomposition of solid waste and heat produced from facilities lights are not expected to have negative impacts to the surrounding environment that require additional mitigation measures.

The surrounding environment is not anticipated to have impacts on the project that will impact operations. The location of the facility is in the upper section of the small catchment of Doodle Brook indicating that seasonal flooding is unlikely to impact the area. The facilities will be located inside a building and will be protected from weather events.

Potential environmental impacts of the facilities on the surrounding environment are factors that will have additional mitigation measures in place to reduce the level of impact and/or likelihood of impact to the surrounding environment. The mitigation measures to prevent these potential impacts are described below.

5. Summary of Proposed Mitigation

The environmental impacts identified that will utilize mitigation measures to avoid or limit the potential impact include:

- Accidental fish release to waterbodies

Accidental release of tilapia fish to watercourses or water bodies is a risk that requires specific mitigation to ensure impacts to aquatic ecosystems are prevented. Two types of mitigation will be used at the facilities; physical barriers to prevent tilapia release and the temperature of the potential receiving waters. The tilapia fish will be raised in a closed loop production system that will not discharge any effluent to surface water. The water leaving the tanks will be filtered and processed in the nutrient extraction system; this system will exclude any release of fish from the tanks. Waste water produced by the facilities will be limited to wash water and sewer water that will be discharged to the Town of St. Stephen waste water system. The operations of the facilities will not discharge any fish supply water to the waste water system. If an accidental release of fish to the waste water system occurs the fish will be prevented from leaving the facilities by a filtering/trap system that will be installed prior to the connection with the waste water services line.

In the event of a catastrophic loss of containment of the fish from their tanks, the fish will be prevented from entering surface water by the physical barriers of the building such as doors and access points. Any fish that may leave the building in the event of a catastrophic loss of containment would be prevented from reaching surface water bodies by the distance of > 100 m from the edge of the building to the nearest point of Doodle Brook.

In the unlikely event of any tilapia fish reaching a watercourse or water body, the temperature of the water would either kill the fish or induce the fish into a lethargic state. The developer of the fish stock that will be used at the Stewart Farms facility, Norther Tilapia, has observed the effect of temperature on the fish during the past 20 years of raising the fish. This type of Nile Tilapia fish have optimal growth in water temperature of 28 °C for regular activity, growth and reproduction. At water temperatures below 22°C the fish cannot reproduce and below 20°C the fish will not eat. The fish will die in water temperatures of 12°C or lower. The water temperature the St. Croix River has an average summer temperature between 15 and 17 °C and the winter water temperature is cold enough to allow ice to form (NBDE 2007). While the summer water temperatures may be warm enough in the summer months to allow tilapia to survive for short durations, the colder water temperatures in the fall and winter would kill any tilapia fish that would inhabit waters during these months.

The physical barriers of the operations indicate that the likelihood of accidental release of tilapia to water courses or water bodies is low and the temperature sensitivity of tilapia fish indicate the negative effects of any accidental release would be minimal.

6. Public Involvement

Stewart Farms has sought public input during the planning stages of the Project to inform individuals, groups, agencies and companies of the Project and seek input on potential impacts Project that may affect the public. Public consultation initiated by Stewart Farms includes:

- Meeting with the Town of St. Stephen Mayor, Council and Senior Staff;
- Correspondence and meeting with Town of St. Stephen Development Officer Derek O'Brien and Director of Operations Lee Johnston;
- Correspondence and meeting with Aboriginal Secretariat representatives Kim Allen and John Smith; and
- Open house event in the Town of St. Stephen.

A report providing details of the public consultation events will be prepared as a separate document following the submission of the Registration Document.

7. Approval of the Undertaking

The Stewart Farms Project in St. Stephen will require several approvals in the forms of permits, licenses and certifications from government and certification agencies to operate the aquaponics facilities. The applications of approvals that have been submitted or will be submitted for the Project include:

- Inland Aquaculture License submitted to New Brunswick Department of Fisheries and Aquaculture;
- Approval to Construct and Approval to Operate from New Brunswick Department of Environment and Local Government;
- Canadian Food Inspection Agency permits ;
- Introduction and Transfer Permit from the New Brunswick Introduction and Transfer Committee;
- Building and construction work permits from the Municipal Planning Commission; and
- Certification for organic aquaculture production under the Canadian Organic Aquaculture Standards.

8. Funding

Stewart Farms has or will be requesting funding support from government agencies in the forms of loans, loan guarantees and grants to support technology development and capital funds. Applications for support have been or will be submitted to funding agencies including National Research Council (NRC) Industrial Research Assistance Program (IRAP), Atlantic Canada Opportunities Agency (ACOA), Post-Secondary Training and Labour, Opportunities NB, New Brunswick Innovation Foundation (NBIF) and Trade and Assistance Programs and Services (TAPS) through Agriculture, Aquaculture and Fisheries New Brunswick.

9. Signature

July 14th / 16
Date



Signature of Stewart Vertical Farms
Chief Executive Officer - *Tanner Stewart*

10. References

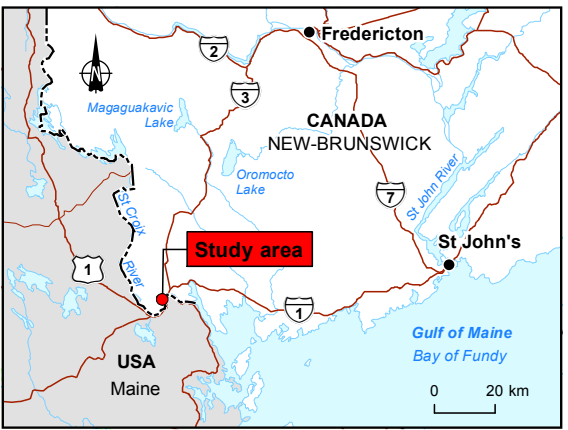
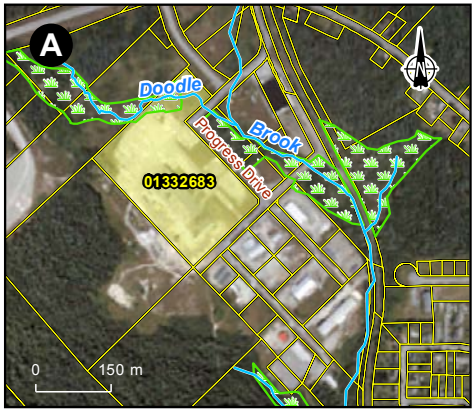
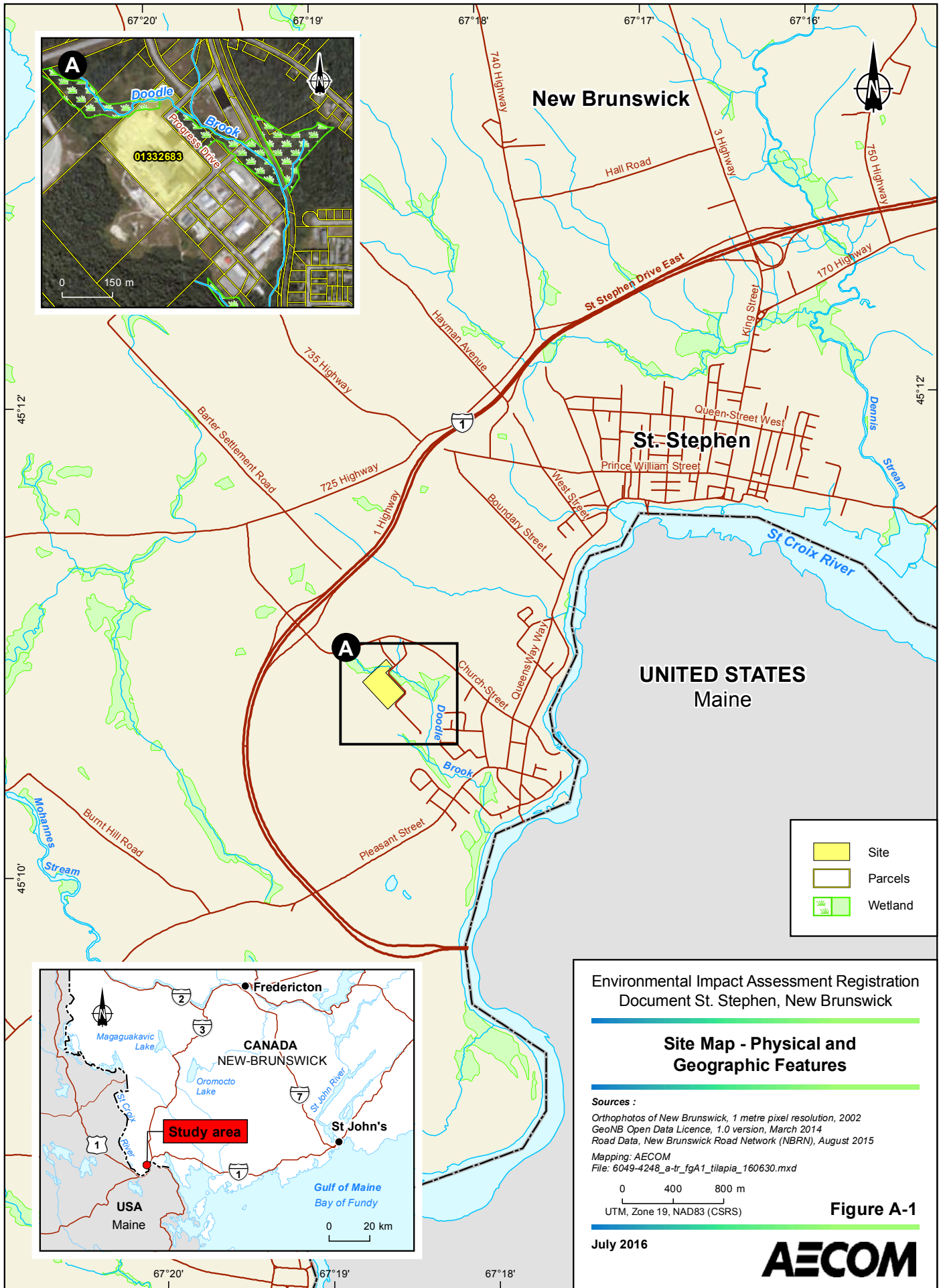
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AECOM

Appendix A

Figures



- Site
- Parcels
- Wetland

Environmental Impact Assessment Registration Document St. Stephen, New Brunswick

Site Map - Physical and Geographic Features

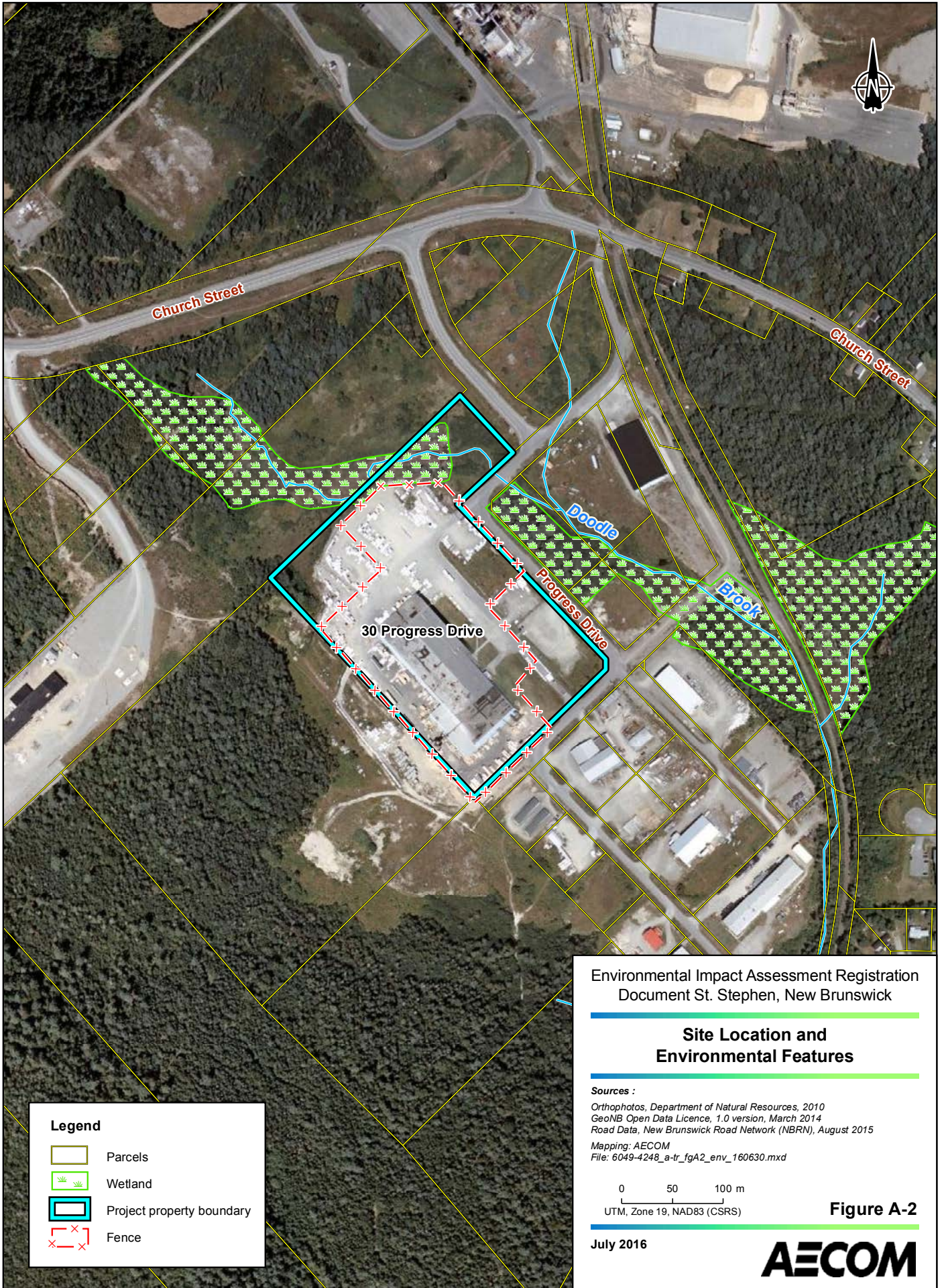
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 Orthophotos of New Brunswick, 1 metre pixel resolution, 2002
 GeoNB Open Data Licence, 1.0 version, March 2014
 Road Data, New Brunswick Road Network (NBRN), August 2015
 Mapping: AECOM
 File: 6049-4248_a-tr_fgA1_tilapia_160630.mxd

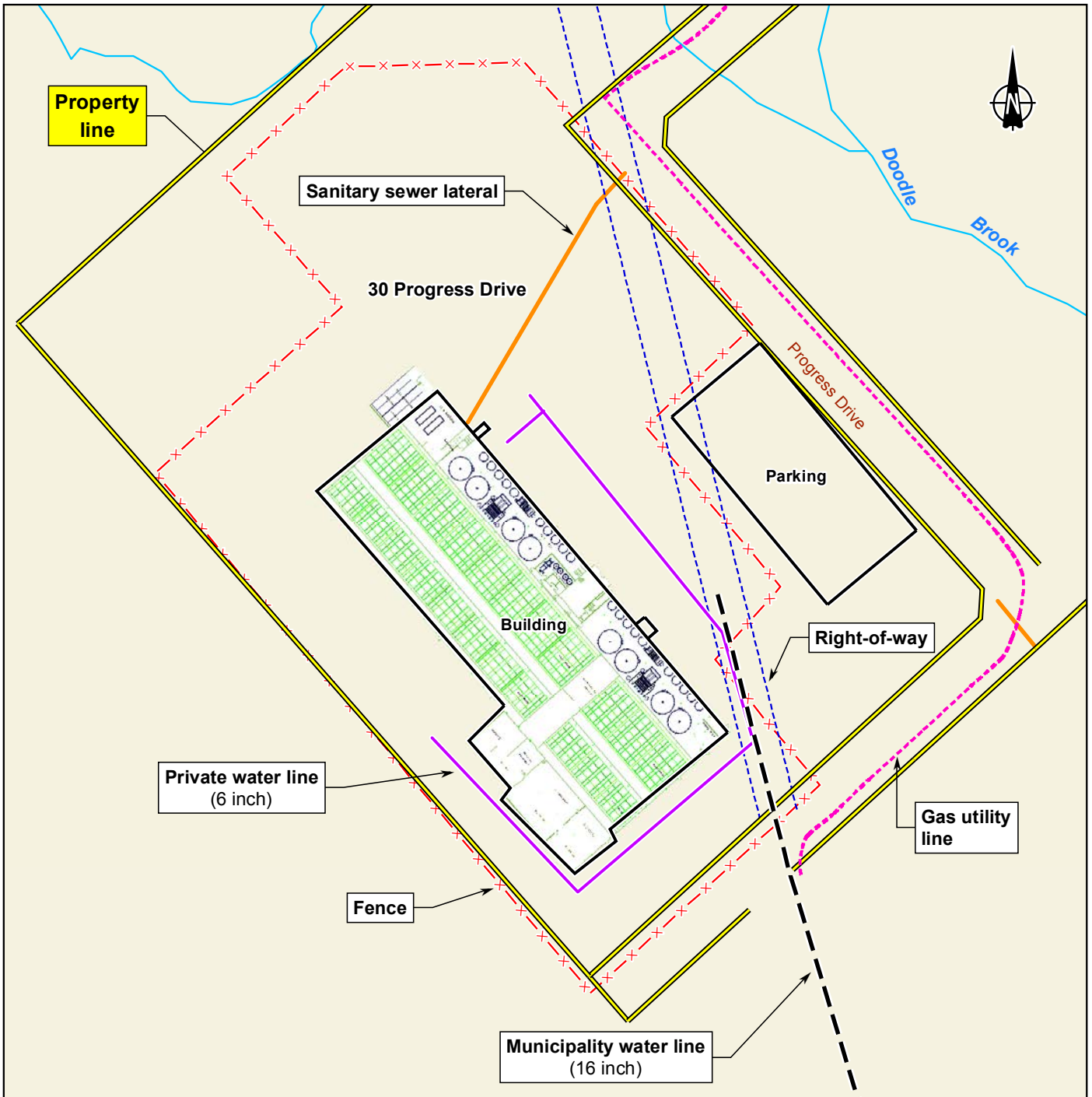
0 400 800 m
 UTM, Zone 19, NAD83 (CSRS)

Figure A-1

July 2016







Environmental Impact Assessment Registration
Document St. Stephen, New Brunswick

Infrastructure and Building Layout

Sources :

Orthophotos, Department of Natural Resources, 2010
GeoNB Open Data Licence, 1.0 version, March 2014
Road Data, New Brunswick Road Network (NBRN), August 2015
Stewart Farms Farm Layout 06-2016_Rev1.dwg, June 2016 *

Mapping: AECOM
File: 6049-4248_a-tr_fgA3_infra_160630.mxd

* See figure A-4 for details

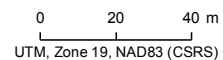
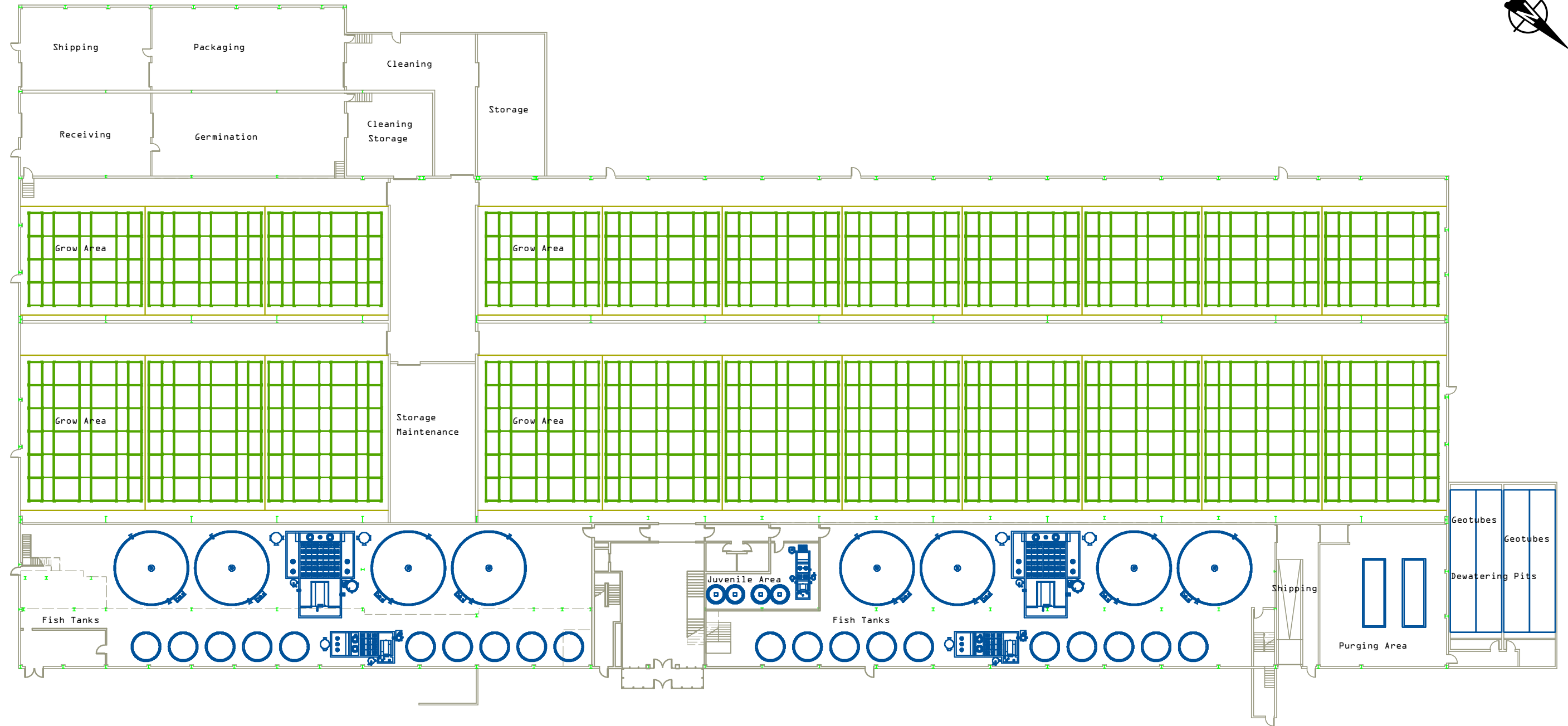


Figure A-3

July 2016





Environmental Impact Assessment Registration
Document St. Stephen, New Brunswick

Preliminary Drawing of Aquaponics Facilities

Sources :
Stewart Farms Farm Layout 06-2016_Rev1.dwg, June 2016
Cartographie : AECOM
Fichier : 6049-4248_a-tr_fgA4_plans_160630.mxd

Progress Drive
▼

Figure A-4

July 2016





AECOM

Appendix B

**Land Owner Written
Consent**

TERRA-NB HOLDINGS INC.

TERRA-NB HOLDINGS INC. (Landlord) and STEWART'S VERTICAL FARMS INC. (Tenant) have engaged in a long-term lease agreement beginning March 1, 2016.

Within the terms of this agreement, the Landlord authorizes the Tenant to build and operate a vertical farm within the real property located at 30 Progress Drive, St. Stephen New Brunswick.

The Tenant is authorized, but no limited to:

- Build and operate a vertical (aquaponic) farm.
- Make alterations to the building for the betterment of property
- Conduct any required testing for permitting/licensing
- Erect signs
- Apply for any and all permits & licensing



Terra-NB

Tanner Stewart

06/05/2016

dd/mm/yyyy



AECOM

Appendix **C**

**Project Related
Documents**

Project No: 12-9687

Prepared for:

Powell Associates Ltd.
Attn: Mr. Paul Moffett
55 Drury Cove Road
Saint John, NB
E2L 4E3




Phase I Environmental Site Assessment (ESA)

30 Progress Drive
St. Stephen, NB
PID #'s 01332683 & 15031099

December 2012

Prepared by:

Fundy Engineering & Consulting
Ltd.
27 Wellington Row
PO Box 6626
Saint John, New Brunswick
E2L 4S1

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 506.635.0206
 fundy@fundyeng.com

FUNDY Engineering

www.fundyeng.com

EXECUTIVE SUMMARY

Fundy Engineering & Consulting Ltd. (Fundy Engineering) was retained by Mr. Paul Moffett of Powell Associates Ltd. to undertake a Phase I Environmental Site Assessment (ESA) on two parcels of land located at 30 Progress Drive in St. Stephen, New Brunswick. The subject properties are identified by the New Brunswick Geographic Information Corporation as Property Identification Numbers (PID) 01332683 & 15031099.

A Phase I Environmental Site Assessment (ESA) is a preliminary evaluation, the purpose of which is to address overall environmental concerns, and determine the risk of potential and actual liabilities of the property or properties. Fundy Engineering's investigation procedure is consistent with CSA Z768-01, and therefore consists of a records review of the current and historical conditions of the property, the completion of a site visit, site interviews with personal contacts and regulatory officials that are knowledgeable of the site, and the interpretation and documenting of the findings.

The subject sites are located at 30 Progress Drive and are owned by 507773 N.B. Ltd. (per the Service New Brunswick database). The subject sites are currently a wood product manufacturing plant (currently not operational) and a vacant parcel of land. The property is irregular in shape with a total area of approximately 14.55 ha. The subject properties and surrounding properties are zoned as industrial. All properties in the area are supplied potable water and wastewater through the Town of St. Stephen.

The building located at 30 Progressive Drive is a steel framed building with metal clad siding founded on a concrete slab on grade. The building does contain a second level that houses offices with the remaining area being open for the manufacturing plant. The original building was constructed in 1974 and additions were added to each end of the building after a major fire.

On Monday, 26 November 2012, Mr. Steve Little, *P. Tech., CESA* and Mr. Richard Casey, *P. Tech., CESA* of Fundy Engineering visited the site. A thorough walkover of the site was completed to gain an understanding of the property boundaries, potential environmental concerns from the subject site, and of the readily visible adjoining properties.

Fundy Engineering's procedure for completing Phase I ESA's is to evaluate potential sources of environmental impacts as either actual, potential or low. If an actual environmental concern is noted, further intrusive investigations are recommended to either confirm/deny the potential source of concern. If a potential environmental concern is noted, this is typically an observation by Fundy Engineering of an area for improvement, recognition for special consideration, or best management practice suggestion. Low indicates no observations for the specific area of interest was noted.

The Phase I ESA completed by Fundy Engineering at 30 Progress Drive in St. Stephen, New Brunswick (PID 01332683 & 15031099) determined that the property does not contain any actual environmental concerns; however, there are nine potential environmental liabilities associated with historical land use, aboveground storage tanks, aboveground chemicals, waste management, polychlorinated biphenyls (PCB's), asbestos containing material (ACMs), ozone depleting substances (ODS's), lead-based paints, watercourses and hydraulic equipment. These are not considered significant, immediate concerns at this time.

As a result of the work completed the following is recommended:

- It is recommended that further inquiry about the petroleum storage tank records, registered at the subject properties be looked at and updated.
- The hydraulic waste oil and containers should be removed and properly disposed of from the property.
- All waste material that is scattered around the sites and is not being used should either be recycled or disposed of properly in accordance with the local solid waste commission.
- When the light ballasts are no longer functional they should be checked and properly disposed of at an approved handling facility if they contain PCBs.
- If there is any suspected asbestos containing material, it should be analyzed and removed by a qualified professional and disposed of properly. This is not considered a significant, immediate concern at this time
- It is recommended that all equipment with potential ozone depleting substances be maintained and serviced by a qualified professional.
- If the building is to be demolished or renovated, the presence or absence of lead levels in the paint must be investigated.
- It is recommended that a regular maintenance schedule be put place to inspect all hydraulic equipment when in use to ensure that there are no leaks. If the equipment is not in use then it should be removed from the site.
- If new development on the site is to occur, compliance with all regulations in regards to wetlands and / or watercourses or the regulated 30 m buffer must be met.

The executive summary is subject to the same limitations detailed within the report.

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EQUIVALENTS

1 Litre (L)	=	0.264 US gallons (gal)
1 L	=	0.220 Imperial gallons (lgal)
1 centimetre (cm)	=	0.394 inches (in)
1 metre (m)	=	3.281 feet (ft)
1 m ²	=	10.765 ft ²
1 m ²	=	2.471 × 10 ⁻⁴ acres
1 000 L	=	1 m ³
1 part per million (ppm)	=	1 milligram (mg) · L ⁻¹

LIST OF ACRONYMS

ARBCA:	Atlantic Risk Based Corrective Action
BH:	Borehole
BTEX:	Benzene, Toluene, Ethylbenzene, and Xylenes
CDWQGs:	Canadian Drinking Water Quality Guidelines
CSA:	Canadian Standards Association
e.g.:	(<i>exempli gratia</i>) for example
ESA:	Environmental Site Assessment
<i>et al.:</i>	(<i>et alii</i>) and others
etc.:	<i>et cetera</i>
ha:	hectare
<i>i.e.:</i>	(<i>id est</i>) namely / that is
FO:	Fuel Oil
Ltd.:	Limited
LDPE :	low density polyethylene
LO:	Lube Oil
<i>n:</i>	statistical value that refers to the number of observations
NB:	New Brunswick
ND:	Not Detected
NBDENV:	New Brunswick Department of the Environment
PID:	Property Identification number
PLO:	Possible Lube Oil
RPC:	Research Productivity Council
TP-1:	Test Pit-1
TPH:	Total Petroleum Hydrocarbons
WFO:	Weathered Fuel Oil

1.0 INTRODUCTION

Fundy Engineering & Consulting Ltd. (Fundy Engineering) was retained by Mr. Paul Moffett of Powell Associates Ltd. to undertake a Phase I Environmental Site Assessment (ESA) on two parcels of land located at 30 Progress Drive in St. Stephen, New Brunswick. The subject property is identified by the New Brunswick Geographic Information Corporation as Property Identification Number (PID) 01332683 & 15031099 (Figure 1). A copy of the parcel information can be found in Appendix I.

The purpose of the assessment was to determine if there are any environmental liabilities associated with the property through a review of the current site conditions, available records of past use of the property, and compliance with applicable environmental regulations prior to the sale of the property.

1.1 Scope of Work

A Phase I ESA is a preliminary evaluation, the purpose of which is to address overall environmental concerns, and determine the risk of potential and actual liabilities of the property or properties. Fundy Engineering’s investigation procedure is consistent with CSA Z768-01, and therefore consists of a records review of the current and historical conditions of the property, the completion of a site visit, site interviews with personal and regulatory officials that are knowledgeable of the site, and the interpretation and documenting of the findings.

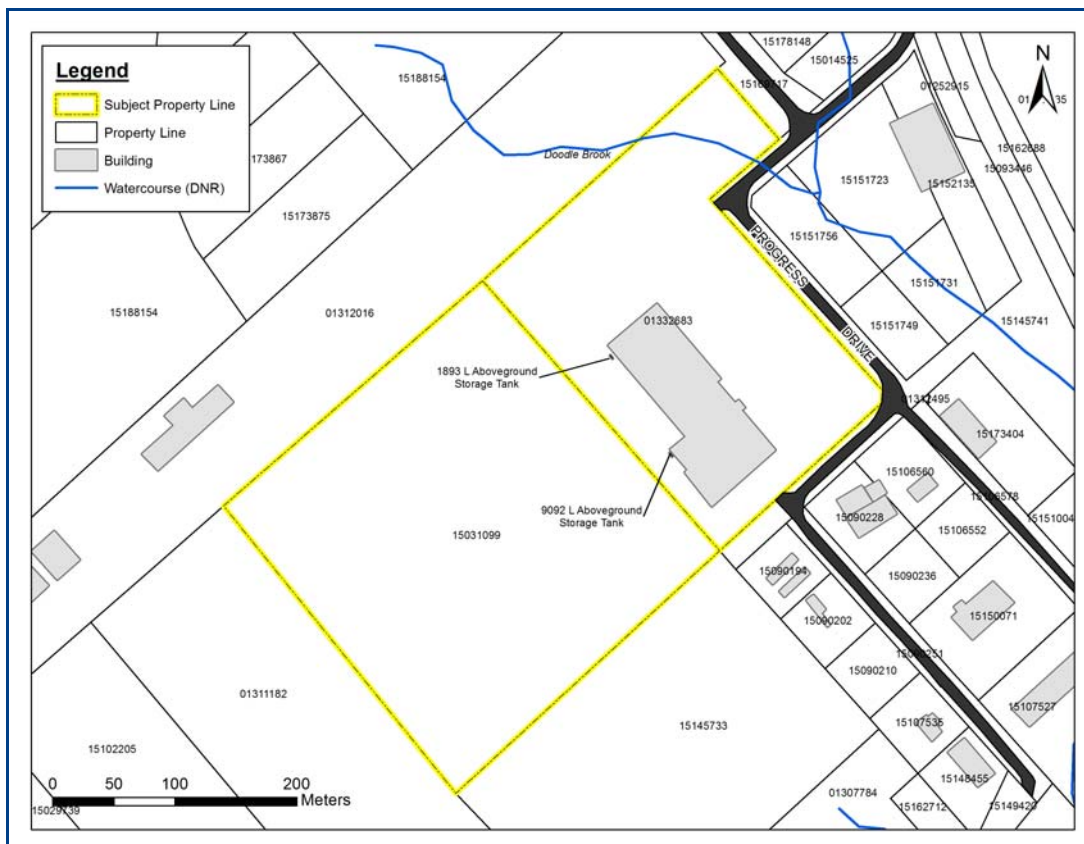


Figure 1. Property Identification Number 01332683 & 15031099 (i.e., highlighted in yellow) at 30 Progress Drive in St. Stephen, NB that is the subject of this Phase I Environmental Site Assessment.

2.0 SITE DESCRIPTION

2.1 Site Conditions

The subject sites are located at 30 Progress Drive and are owned by 507773 N.B. Ltd. (per the Service New Brunswick database). The subject sites are currently a wood product manufacturing plant (currently not operational) and a vacant parcel of land.

The property is irregular in shape with a total area of approximately 14.55 ha. The subject properties and surrounding properties are zoned as industrial. All properties in the area are supplied potable water and wastewater through the Town of St. Stephen.



Figure 2. View of the subject property on 30 Progress Drive, St. Stephen, NB.
Photograph taken on 26 November 2012.

2.2 Building Description

The building located at 30 Progressive Drive is a steel framed building with metal clad siding founded on a concrete slab on grade. The building does contain a second level that houses offices with the remaining area being open for the manufacturing plant. The original building was constructed in 1974 and additions were added to each end of the building after a major fire.

3.0 REFERENCE GUIDELINES

3.1 Regulatory Framework

The management of the environment, with respect to the most frequently encountered environmental concerns is regulated by agencies of the Provincial and Federal Government. A listing of the potential environmental concerns, regulatory agency, and the appropriate guideline document are as shown on Table 1.

Table 1. Potential Environmental Concerns, Regulatory Agency, and Guideline.

Potential Environmental Concern	Regulatory Agency	Guideline
• Asbestos	Work Safe NB	A Code for Working with Materials Containing Asbestos in New Brunswick
• Petroleum Hydrocarbons Storage	NB Department of the Environment	Construction Standards for Installation and Removal of Petroleum Storage Systems
• Petroleum Hydrocarbons Release into Subsurface	NB Department of the Environment	Guideline for the Management of Contaminated Sites
• Heavy Metals and Hazardous Wastes	NB Department of the Environment	CCME: Interim Canadian Environmental Quality Criteria for Contaminated Sites
• Mold and Fungi (Air Quality Concerns)	Work Safe NB	Standards: American Society of Heating, Refrigeration, and Air Conditioning Engineers
• Polychlorinated Biphenyls (PCBs)	NB Department of the Environment	CCME: Guidelines for the Management of Wastes Containing Polychlorinated Biphenyls
• Drinking Water Guidelines	Environment Canada	Canadian Drinking Water Quality Guidelines

4.0 RECORDS REVIEW

4.1 Site Record Search

The following are the locations and results of the records search which were conducted to determine the former land use.

Table 2. Summary of Record Search.

Source	Record	Findings	Location within report
<ul style="list-style-type: none"> Aerial Photographs from New Brunswick Department of Natural Resources 	1976	Original building	Section 4.3
	1980, 2010	Original building with additions	
<ul style="list-style-type: none"> Fire Insurance Mapping from Fundy Engineering library 	1927 & 1967	No records available	Section 4.4
<ul style="list-style-type: none"> City Directory search from Fundy Engineering library 	1933-2001	No records available	Section 4.4
<ul style="list-style-type: none"> Service New Brunswick 	Parcel Information and property mapping	No records available.	Section 4.10
<ul style="list-style-type: none"> Previous Reports 	na	No records available.	Section 4.6
<ul style="list-style-type: none"> Fundy Engineering Records 	na	No records available.	Section 4.7
<ul style="list-style-type: none"> Bedrock Geology Map 	Department of Mines and Resources, 2005, Map NTS 21G/03, scale 1:50,000	St. Stephen Gabbro-troctolite, olivine gabbro and minor anorthosite, locally abundant biotite and hornblende-biotite grandiorite, diorite, quartz diorite, and biotite granite and autobreccia	Section 4.8
<ul style="list-style-type: none"> Surficial Geology Map 	V.N. Rampton et al, Department of Natural Resources, Map 1594A, 1984.	Late Wisconsinan and/or early Holocene lacustrine and morainal sediments blankets and plains made up of sand, silt, minor clay and gravel, patchy thin veneer of organic sediment; generally 1 to 10m thick.	Section 4.8
<ul style="list-style-type: none"> Site Topography 	SNB Geographic Data & Maps	Site Elevations	Section 4.9
<ul style="list-style-type: none"> NBDENV Records Review 	Regulatory Infractions	No records found.	Section 4.10
	Reportable Spill Occurrences	No records found.	
	Contaminated Sites	Contamination found at PID # 01332683	
	Hazardous Waste Generator	No records found.	
	PCB Storage Site	No records found.	
	Landfill Records	No records found.	
	Underground and Aboveground storage	Petroleum Storage Tanks registered at PID # 001332683	

4.2 Interviews Completed

An interview was conducted with Mr. Bob Coates (SWP represented) at the subject property to gain access and discuss the conditions of the site.

4.3 Site Mapping

Prior to the site visit, property maps and aerial photographs were retrieved from the Service New Brunswick database. The property boundaries were found by super-imposing the property lines onto a 1976, 1980 and 2010 aerial photographs (refer to Figures 3 to 5, respectively).

The 2010 aerial photograph that was reviewed depicts the current condition of the property. The 1976 aerial shows the original building that was built on the site.

4.4 Former Land Use

According to interviews, historical records and aerial photographs the building at 30 Progress Drive was constructed in the mid 1970's. The building was built in 1974 by Atwood Morell, a company specializing in stainless steel casings for the nuclear industry. Texas Steel bought the property to produce steel castings in 1978 after Atwood Morell declared bankruptcy. During the Texas Steel's ownership a major fire destroyed parts of the building. The building was reconstructed; during the process 25 m were added to the north end and 37 m were added to the south end. Texas Steel closed the business in 1982. In 1984, the St. Stephen Foundry purchased the assets to produce iron castings. The foundry operated until 1987. The building was used for warehousing until 1998, at which time SWP industries purchased the property and began reconstructing the building to facilitate fence production.

4.5 Surrounding Land Use

The properties are surrounded to the north and west by undeveloped and forested lands. Immediately adjacent to the north is a small area of undeveloped land, leading to residential properties and Church Street. Flakeboard Co. Ltd. is located North of Church Street, leading to undeveloped land and St. Stephen Drive. To the east are commercial properties, including a machine shop and a furniture manufacturer. Land use further east of the commercial properties is residential. A copy of the Parcel Information for the subject property is included in Appendix I.

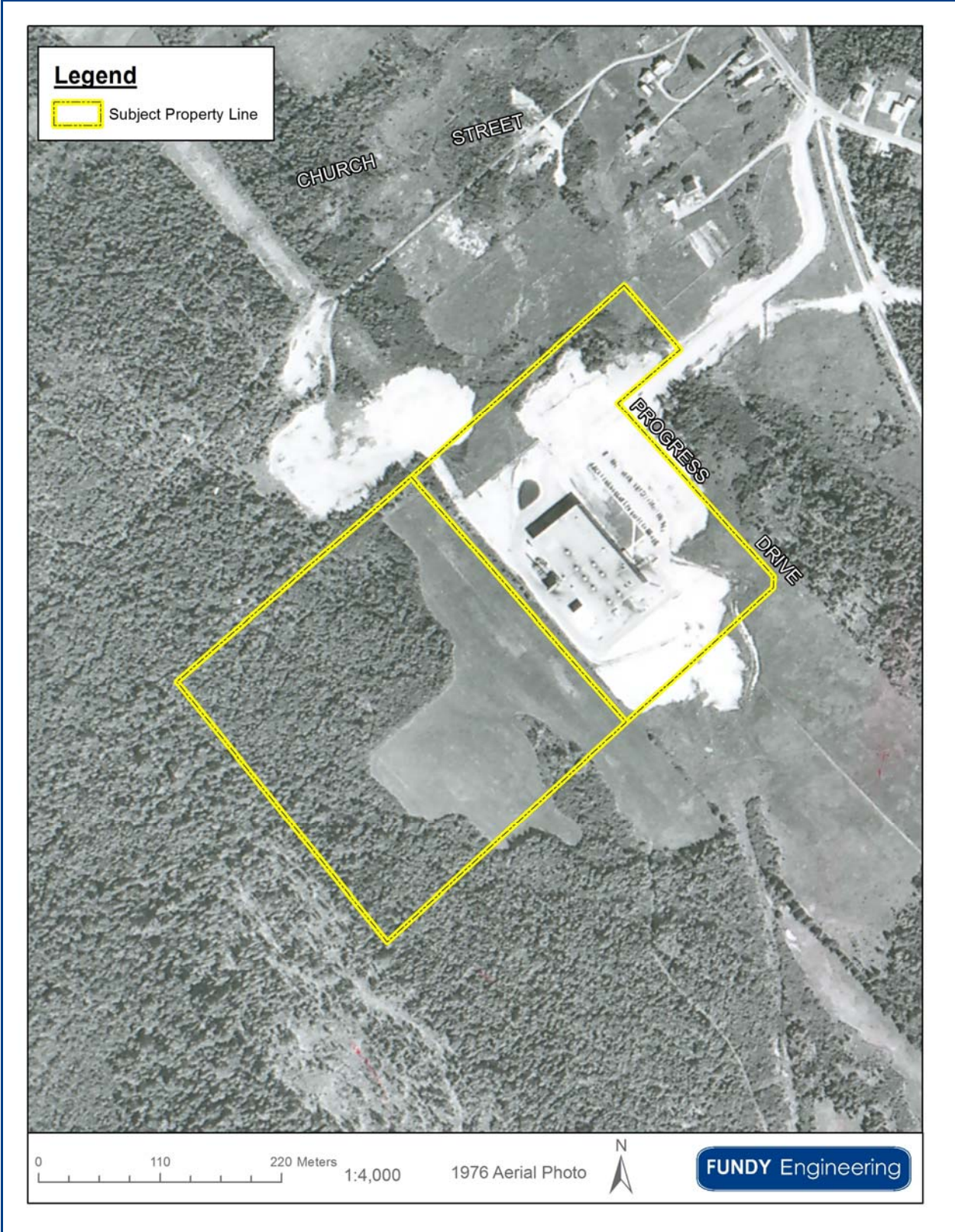


Figure 3. Aerial photograph, circa 1977, showing Property Identification Number 01332683 & 15031099 at 30 Progress Drive in St. Stephen, NB.



Figure 4. Aerial photograph, circa 1980, showing Property Identification Number 01332683 & 15031099 at 30 Progress Drive in St. Stephen, NB.

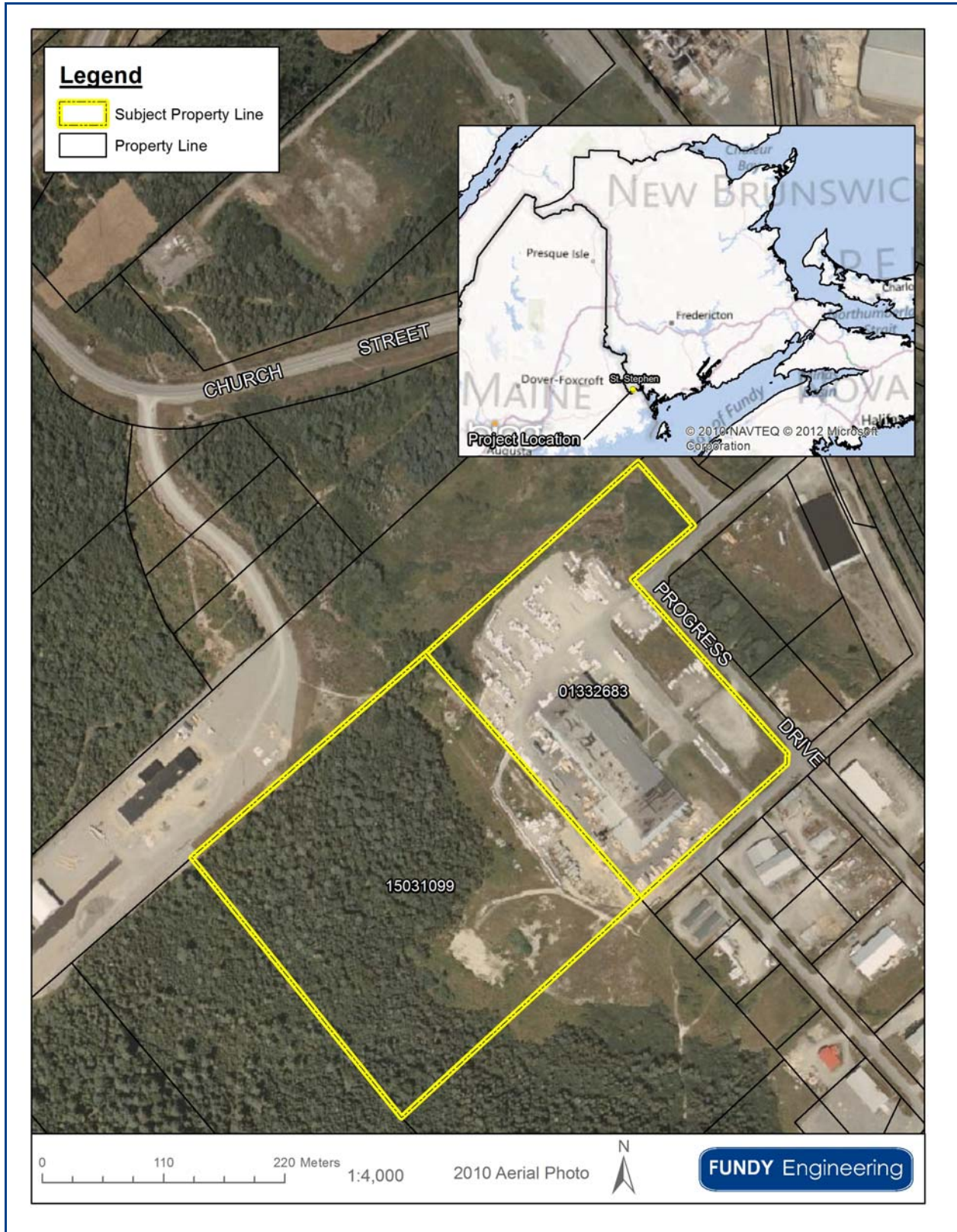


Figure 5. Aerial photograph, circa 2010, showing Property Identification Number 01332683 & 15031099 at 30 Progress Drive in St. Stephen, NB.

4.6 Previous Reports

No previous reports were available for review at the time of the site assessment.

4.7 Fundy Engineering Records

Fundy Engineering completed a Phase I ESA of the subject property in June 2009. At the time of the site visit the manufacturing facility was in operation. It was the opinion of Fundy Engineering that the properties located at 30 Progress Avenue, St. Stephen, NB (PID #s 01332683 and 15031099), contain no actual environmental liabilities; however there were some potential concerns.

- **Above Ground Chemicals and Hazardous Materials** – There were several locations on the properties where lubricants, hydraulic oils, solvents and other chemicals were stored. Most of these containers were stored properly in well-labeled and sealed containers. Some of the containers, however, were not stored properly, do not have any covers, or were not labeled. It was recommended that these containers be stored properly, with covers and visible labels, in an area designated for chemical storage only. If these materials were not going to be used they should be disposed of properly in accordance with the local solid waste commission.
- **Above Ground Fuel Storage** – There were two above ground storage tanks located outside the SWP building on the south side: one containing furnace oil and the other containing diesel. The tanks appeared to be in good condition, however staining was observed beneath the diesel storage tank. It was recommended that the tanks be placed in a containment structures to prevent any future leaks or spills.
- **Staining and Leaks** – A stain was observed under the above ground diesel fuel storage tank. This suggests that either the tank has a leak or diesel has been spilled during the filling of the tank. It was recommended that the soils beneath the stain be sampled for hydrocarbon contamination. It was also recommended that the stain be cleaned, and the tank be placed in a containment structure to prevent any future spills or leaks.
- **Unidentified Substances** – There were several drums and containers of unidentified substances in various locations around the site. The contents of these containers should be determined and if they are going to be used they should be properly labeled stored properly in an area designated for chemical storage only. If these materials are not going to be used they should be disposed of properly at a local hazardous material depot.
- **Asbestos Containing Materials** – The age of the boiler suggests that the insulation around the pipes and/or the boiler itself may contain asbestos. A small quantity of non-friable asbestos containing materials is not generally considered a major hazard. Thus, the presence of this material is not a major concern. However, if improvements are made to the boiler or the insulated pipes, they should be tested for asbestos and if asbestos is found it should be removed by a qualified professional.
- **Ozone Depleting Substances** – The office building is equipped with a personal air conditioning unit. Most personal air condition units contain R22 refrigerant, which is an interim HCFC. For the time being they are safe products but are being slowly phased out. At the present, the air conditioning unit is not a major concern. Two discarded

fridges are also found behind the building. One of these refrigerators contains an unknown refrigerant. It is recommended that this refrigerator be removed and that the refrigeration equipment be properly disposed of at a local hazardous material depot.

- **Hydraulic Equipment** – Hydraulic equipment was used at this facility. Most hydraulic operations are performed by vehicles, but a power pack is also located on the south side of the building. All hydraulic equipment appears to be in good condition and no stains or leaks were visible at the time of the site visit. The hydraulic equipment is therefore not considered a concern at the present time. Nonetheless, it is recommended that a regular maintenance schedule be put in place to inspect all hydraulic equipment to ensure that there are no leaks.

4.8 Localized Soil and Geology

The local bedrock geology is made up of the St. Stephen Gabbro-troctolite, olivine gabbro and minor anorthosite, locally abundant biotite and hornblende-biotite grandiorite, diorite, quartz diorite, and biotite granite and autobreccia. (Fyffe, L. R. 2005. “*Bedrock Geology of the St. Stephen Area (NTS 21 G/03) Charlotte County, New Brunswick*”. Department of Natural Resources, Minerals, Policy and Planning Division. Plate 2005-28).

The local surficial geology is made up of Late Wisconsinan and/or early Holocene lacustrine and morainal sediments blankets and plains made up of sand, silt, minor clay and gravel, patchy thin veneer of organic sediment; generally 1 to 10m thick (Rampton, VN. 1984. “*Generalized Surficial Geology Map of New Brunswick*”. Department of Natural Resources and Energy, Minerals, Policy and Planning Division, NR-8 Scale 1:500 000).

4.9 Site Topography

The property gently slopes in a south western direction. This was found by reviewing a topographic map (1: 50,000) and confirmed during the site visit.

4.10 Regulatory Information

A record search was sent to the New Brunswick Department of the Environment (NBDENV). The record search was to determine if there was any record of Ministerial Orders, Administrative Orders, Certificates of Approvals, or environmental information listed with the NBDENV.

Petroleum storage tank information related to PID # 01332683 is below. These tanks have been registered with the Department, under the Petroleum Product Storage and Handling Regulation.

Our records indicate that there has been contamination found at Church St., St. Stephen, Former Foundry (PID # 01332683).

This PID number is not registered with the Department as a PCB Storage site.

We have no records of landfill sites or former dumpsites located near this property.

Tank Information for 30 Progress Drive, Saint John, NB:**PID # 55158216**

Current Status: Removed
Date Out of Service: 1998-12-29
Installation Date: 1972
Tank Size: 45,460 Litre
Location: Underground Ground
Constructed of: Single Wall Steel
Substance stored: Furnace Oil

Current Status: Active
Date Out of Service:
Installation Date: 2000
Tank Size: 1893 Litre
Location: Aboveground
Constructed of: Double Wall Steel
Substance stored: Diesel

Current Status: Active
Date Out of Service:
Installation Date: 2001
Tank Size: 9092 Litre
Location: Aboveground
Constructed of: Double Wall Steel
Substance stored: Furnace Oil

A copy of the NBDENV correspondence can be found in Appendix II.

5.0 PHASE I ESA INVESTIGATION

5.1 Dates and Staff

On Monday, 26 November 2012, Mr. Steve Little, *P. Tech., CESA* and Mr. Richard Casey, *P. Tech., CESA* of Fundy Engineering visited the site. A thorough walkover of the site was completed to gain an understanding of the property boundaries, potential environmental concerns from the subject site, and of the readily visible adjoining properties.

5.2 Site Findings

Fundy Engineering’s procedure for completing Phase I ESA’s is to evaluate potential sources of environmental impacts as either actual, potential or low. If an actual environmental concern is noted, further intrusive investigations are recommended to either confirm/deny the potential source of concern. If a potential environmental concern is noted, this is typically an observation by Fundy Engineering of an area for improvement, recognition for special consideration, or best management practice suggestion. Low indicates no observations for the specific area of interest was noted. The table below includes a summary of the site findings.

Table 3. Summary of Site Findings.

Potential Source of Environmental Impact	Potential Concern			Findings	Recommended Action
	Actual	Potential	Low		
• Current Land Use			✓	No operations currently ongoing at subject property.	None.
• Historical Land Use		✓		Former foundry and former PCB storage facility and former remediation file.	More details in Sect 5.2.1
• Adjacent Properties			✓	The property is surrounded industrial properties	None.
• Underground / Above Ground Fuel Storage		✓		Two AST present at the site	More details in Sect 5.2.2
• Underground / Above Ground Chemicals		✓		Several small containers of waste hydraulic oil located in the boiler room of the building.	More details in Sect 5.2.3
• Waste Management		✓		Numerous parts, metal debris etc. scattered over both properties.	More details in Sect 5.2.4
• Spill and Stain Areas			✓	None observed.	None.
• Wastewater Discharges			✓	Municipal system	None.
• Air Discharges			✓	None observed.	None.
• Polychlorinated Biphenyls (PCBs)		✓		Due to the age of the building PCBs may be present.	More details in Sect 5.2.5
• Asbestos Containing Materials (ACMs)		✓		Due to the age of the buildings ACMs may be present.	More details in Sect 5.2.6
• UFFI			✓	None observed.	None.
• Ozone Depleting Substances (ODS)		✓		Roof top HVAC Units and small A/C units	More details in Sect 5.2.7
• Lead		✓		Due to the age of the building lead based paints may be present.	More details in Sect 5.2.8
• Electromagnetic Fields			✓	None observed.	None.
• Unidentified Substances			✓	None observed.	None.

Potential Source of Environmental Impact	Potential Concern			Findings	Recommended Action
	Actual	Potential	Low		
• Indoor Air Quality/Mould			✓	None observed.	None.
• Odours			✓	None observed.	None.
• Hydraulic Hoists and Elevators			✓	None observed	None.
• Potable Well Water			✓	Municipal system	None.
• Landfill Activities			✓	None observed.	None.
• Wetlands / Watercourses		✓		Watercourse located to the north	More details in Sect 5.2.9
• Other		✓		Hydraulic equipment	More details in Sect 5.2.10

5.2.1 Historical Land Use

Historical records and interviews conducted indicated that the subject property had a NBDENV remediation sites management report and was once a registered PCB storage facility, as Fundy Engineering mentioned in the June 2009 Phase I ESA.

The remediation report was due to the presence of a former underground storage tank that was removed in 1999. A NBDENV representative was present for the removal of the tank and collected two soil samples from the excavation which were both below the current guidelines at the time. It should be noted that these sample results are still below the current Atlantic RBCA Tier I Criteria for an Industrial site with non-potable water and coarse grained soils. **This is not considered a significant, immediate concern at this time.**

It was noted in the June 2009 Phase I ESA completed by Fundy Engineering that PID # 01332683 was formerly a registered PCB storage facility. A letter was reviewed from the NBDENV that shows the property had its PCB storage site certificate of approval revoked. The NBDENV supervised the decontamination of the site which involved taking soil samples to confirm that no PCB contamination was present. All samples were below target levels. **This is not considered a significant, immediate concern at this time.**

5.2.2 Aboveground / Underground Storage Tanks

The building is heated with an oil-fired boiler. The furnace oil is stored in a 9091 L aboveground double walled storage tank located on the south side of the building. It was manufactured in 2000 and appeared to be in good condition at the time of the site visit. No staining was visible around the tank. However, it is recommended that the tank be placed in a containment structure to prevent any hydrocarbons from entering the ground. **This is not considered a significant, immediate concern at this time.**

There is also a 1980 L above-ground diesel storage tank located on the south side of the building. It was manufactured in 2003 and appeared to be in good condition at the time of the site visit. This day tank was used to service the heavy equipment used on site. In the June 2009 Phase I ESA report completed by Fundy Engineering, a 2272 L AST that was manufactured in 2000 was mentioned. According to the NBDENV record search this storage tank and the storage observed at the time of the site visit are not mentioned. However there was a 1893 L storage tank that was manufactured in 2000 registered with the subject property that was listed as active. Under the Petroleum Product Storage and Handling Regulation all sites that have a combined storage capacity of 2000 L or more must be registered with the NBDENV. If a tank is

removed and replaced than it must be done by a licensed tank installer and registered with the NBDENV. **It is recommended that further inquiry about the petroleum storage tanks records registered at the subject properties be looked at and updated. This is not considered a significant, immediate concern at this time.**

According to the NBDENV record search there was a former 45,460 L underground storage located on the subject property. This tank was removed and investigated by the NBDENV as mentioned in the previous section. **This is not considered a significant, immediate concern at this time.**



Figure 6. View of the 9092 L AST (left) and the 1980 L AST (right) located at 30 Progress Drive, St. Stephen, NB. Photograph taken 26 November 2012.

5.2.3 Aboveground Chemicals

During the site visit it was noted that there were several containers in the boiler room that contained used hydraulic oil. **These containers and their contents should be removed from the subject property and disposed of properly at an approved handling facility. This is not considered a significant, immediate concern at this time.**



Figure 7. View of several waste oil storage containers at 30 Progressive Drive, St. Stephen, NB. Photograph taken 26 November 2012.

5.2.4 Waste Management.

There was a fair amount of scrap metal; wood and other debris located in various locations throughout the site. **If these materials are not going to be used they should either be recycled or disposed of properly in accordance with the local solid waste commission. This is not considered a significant, immediate concern at this time.**

5.2.5 Polychlorinated Biphenyls

PCBs are a class of manufactured chemicals that tend to last for many years. They do not break down easily on their own and they are difficult to destroy. From the 1930s to the 1970s, PCBs were widely used ingredients in a number of industrial materials, including sealing and caulking compounds, inks and paint additives. They were also used to make coolants and lubricants for certain kinds of electrical equipment, including transformers, capacitors and light ballasts.

PCB containing light transformers were widely used until the mid-1970's. The use of PCB's in light ballasts was discontinued in 1978. Manufacturer catalogue numbers and/or date codes are marked on ballasts, ballasts housings and capacitors.

During the site visit it was noted that there were light ballasts which contain transformers that potentially have PCBs given the age of the building. The fixtures were noted in all areas of the subject buildings. **When the light ballasts are no longer functional they should be checked and properly disposed of at an approved handling facility if they contain PCBs. This is not considered a significant, immediate concern at this time.**



Figure 8. View of some light fixtures that may contain PCB light ballasts at 30 Progressive Drive, St. Stephen, NB. Photograph taken 26 November 2012.

5.2.6 Asbestos Containing Materials

Asbestos is a concern once it has become deteriorated and friable. Friable asbestos is material that can be readily reduced to dust or powder by hand or moderate pressure. If this is the case it can enter the air as a particulate and be a potential health hazard. Asbestos poses health risks only when fibers are in the air people breathe. Asbestos fibers lodge in the lungs, causing scarring that can ultimately lead to severely impaired lung function and cancers of the lung or lung cavities. If asbestos containing materials are intact and encapsulated, they can be left in place. If the asbestos is friable proper precautions must be taken for its disposal.

Due to the age of the building it is possible that there may still be some asbestos containing materials present. No visible asbestos containing material was noted during the site visit. The age of the oil-fired boiler suggests there may be a possibility of asbestos in the jacketing. Small quantities of asbestos are not generally considered a major hazard. If the material is enclosed, and has not deteriorated or become friable, it may be left in place. **If there is any suspected asbestos containing material, it should be analyzed and removed by a qualified professional and disposed of properly. This is not considered a significant, immediate concern at this time.**

5.2.7 Ozone Depleting Substances

The use of chloroflourocarbons (CFC's) and hydrochloroflourocarbons (HCFC's) are regulated under the Federal Halocarbon Regulations 2003 (SOR/2003-289) which prohibits the use of certain hydrocarbons and stipulates the phasing out of others. As well, the production of HCFC's is covered under the Montreal protocol, which is an international agreement limiting the manufacture of HCFC's and equipment that uses them.

The production of and use of CFC's is now prohibited. HCFCs production in Canada is scheduled to be reduced by 65% by 2010 and no more equipment using this substance is to be manufactured or imported past that date. By 2020 production will be stopped and by 2030 HCFCs will no longer be permitted to be manufactured or imported.

The office building is equipped with a personal air conditioning unit. Most personal air condition units contain R22 refrigerant, which is an interim HCFC. **It is recommended that all equipment be maintained and serviced by a qualified professional. This is not considered a significant, immediate concern at this time.**

5.2.8 Lead Based Paints

Lead based paints content was limited to 0.5% by weight in 1976 by the federal Hazardous Products Act. Lead pipes were used until late 1960s. Lead solder was used from the 1930s to 1986.

Due to the age of the building, lead based paints may be present within the building. If the paint is intact, not to be disturbed, and is covered with a paint not containing high levels of lead, it may be left in place. **If the building is to be demolished or renovated, the presence or absence of lead levels in the paint must be investigated. This is not considered a significant, immediate concern at this time.**

5.2.9 Watercourses

New Brunswick's wetlands and watercourses (*i.e.*, streams) are afforded protection under the *Watercourse and Wetland Alteration Regulation [90-80]* of the *New Brunswick Clean Water Act*. Any proposed alterations within most wetlands and / or streams, or within their 30 m regulated buffer, require permitting through the New Brunswick Department of the Environment Watercourse and Wetlands Alteration (WAWA) Program through a WAWA permit. Any project that has the potential to impact a wetland > 2 ha in size, and / or its regulated 30 m buffer, must be registered through the *Environmental Impact Assessment Regulation [87-83]* of the *New Brunswick Clean Environment Act*. New Brunswick's fish-bearing wetlands and watercourses are also afforded protection under Section 35(2) of the *Fisheries Act*, administered by the Department of Fisheries and Oceans, through a Harmful Alteration, Disruption, or Destruction (HADD) of fish habitat authorization. It is the proponent's responsibility to ensure that these features are properly determined through due diligence investigations and that all necessary permits, authorizations, *etc.* are obtained prior to any impact. Failure to do so could result in fines and remediation if a wetland and / or watercourse are impacted without proper approvals in place.

No on-site (*i.e.*, ground-truthing) exercises have been completed for identifying and delineating watercourses and/or wetlands on PID 01332683; however, data are available through Service New Brunswick's GeoNB mapping service regarding the potential for watercourse and wetland presence. The GeoNB mapping database was queried for potential and actual watercourses and wetlands on the subject property. One watercourse (Doodle Brook) shows up on the mapping and was observed during the site visit. **If future development for a subject property is focused inside the 30 m boundary of Doodle Brook then permits for potential impact are required.**

5.2.10 Hydraulic Equipment

There is some hydraulic equipment used at this facility. All hydraulic equipment appears to be in good condition, and no stains or leaks were visible at the time of the site visit. The hydraulic equipment is therefore not considered a concern at the present time. **Nonetheless, these pieces of equipment use hydraulic oil to function properly and it is recommended that a regular maintenance schedule be put place to inspect all hydraulic equipment to ensure that there are no leaks. If the equipment is not in use then it should be removed from the site.**



Figure 9. View of the hydraulic machinery at the subject site at 30 Progressive Drive, St. Stephen, NB. Photograph taken 26 November 2012.

6.0 RECOMMENDATIONS

As a result of the work completed the following is recommended:

- It is recommended that further inquiry about the petroleum storage tank records, registered at the subject properties be looked at and updated.
- The hydraulic waste oil and containers should be removed and properly disposed of from the property.
- All waste material that is scattered around the sites and is not being used should either be recycled or disposed of properly in accordance with the local solid waste commission.
- When the light ballasts are no longer functional they should be checked and properly disposed of at an approved handling facility if they contain PCBs.
- If there is any suspected asbestos containing material, it should be analyzed and removed by a qualified professional and disposed of properly. This is not considered a significant, immediate concern at this time.
- It is recommended that all equipment with potential ozone depleting substances be maintained and serviced by a qualified professional.
- If the building is to be demolished or renovated, the presence or absence of lead levels in the paint must be investigated.
- It is recommended that a regular maintenance schedule be put place to inspect all hydraulic equipment when in use to ensure that there are no leaks. If the equipment is not in use then it should be removed from the site.
- If new development on the site is to occur, compliance with all regulations in regards to wetlands and / or watercourses or the regulated 30 m buffer must be met.

7.0 LIMITATIONS

The observations made and facts presented in this report are based on site visits and contacts with regulatory authorities carried out in November 2012. Reports of regulatory compliance and conditions of the properties reflect conditions at this time.

While every effort has been made to comprehensively catalogue environmental concerns at the subject site at 30 Progressive Drive in St. Stephen, NB, the appearance, discovery, or development of other environmental problems cannot be precluded. Further investigation may reveal additional information. Should any conditions at the properties be encountered, which differ from those reported herein, Fundy Engineering requests immediate notification to permit an assessment of our interpretations.

Certain data presented are based on the statements and recollections of various individuals. Where this is the case, sources are indicated. No independent confirmation of this information has been made.

The assessment did not include a review of the buildings structural, mechanical, or electrical components. The investigation did not consider possible impediments to development of this property by watercourse and wetland alteration regulations, provincial Environmental Impact Assessment legislation or requirements of the Canadian Environmental Assessment Act (CEAA).

These results are reported confidentially to the client, who is advised to take appropriate action to rectify any reported infractions of regulations. This report is intended for the use of the client. No professional responsibility is assumed for the use or interpretation of the findings by others.

8.0 CONCLUSIONS & CLOSING REMARKS

Fundy Engineering & Consulting Ltd. (Fundy Engineering) was retained by Mr. Paul Moffett of Powell Associates Ltd. to undertake a Phase I Environmental Site Assessment (ESA) on two parcels of land located at 30 Progress Drive in St. Stephen, New Brunswick. The subject property is identified by the New Brunswick Geographic Information Corporation as Property Identification Number (PID) 01332683 & 15031099.

Fundy Engineering's procedure for completing Phase I ESA's is to evaluate potential sources of environmental impacts as either actual, potential or low. If an actual environmental concern is noted, further intrusive investigations are recommended to either confirm/deny the potential source of concern. If a potential environmental concern is noted, this is typically an observation by Fundy Engineering of an area for improvement, recognition for special consideration, or best management practice suggestion. Low indicates no observations for the specific area of interest was noted.

The Phase I ESA completed by Fundy Engineering at 30 Progress Drive in St. Stephen, New Brunswick (PID 01332683 & 15031099) determined that the property does not contain any actual environmental concerns; however, there are nine potential environmental liabilities associated with historical land use, aboveground storage tanks, aboveground chemicals, waste management, polychlorinated biphenyls (PCB's), asbestos containing material (ACMs), ozone depleting substances (ODS's), lead-based paints, watercourses and hydraulic equipment. These are not considered significant, immediate concerns at this time.

We trust this is sufficient for your present needs, please feel free to contact the undersigned for any additional information or clarification that may be required. This report was prepared by Mr. Steve Little, *P. Tech., CESA* and reviewed by Mr. Greg Derrah, *P. Tech., CESA*. The qualifications of the assessors are documented in Appendix III.

Respectfully submitted,

FUNDY ENGINEERING & CONSULTING LTD.



Steve Little, *P. Tech, CESA*



Greg Derrah, *P. Tech, CESA*

9.0 GLOSSARY

The following terms are among those used in this Standard Phase I Environmental Site Assessment Report, which may not be familiar to all readers. These definitions are intended to be explanatory and therefore may differ from those used in other documents.

Aesthetic Objective (AO): a Canadian Drinking Water Quality Guideline, which addresses parameters that may affect consumer acceptance of potable drinking water, such as taste, odour, and colour.

anthropogenic: caused by human activity.

baseline: background or pre-activity data that can be used for comparison when conducting further analyses.

bedrock: solid rock encountered below the soil or any other unconsolidated cover that occurs on the Earth's surface.

bylaw: a law made by municipal government.

carcinogen: a cancer or tumor-causing agent.

distillation: the act of purifying liquids through boiling in order that the steam or gaseous vapours condense to a pure liquid.

fauna: the collective animal life occurring in an area or time period, especially the naturally occurring indigenous animal life.

flora: the collective plant life occurring in an area or time period, especially the naturally occurring indigenous plant life.

friable: materials that can be crumbled, pulverized, or reduced to powder by hand pressure.

geology: the science that studies Earth by looking at its composition and the processes past and present that shaped it, both on the surface and within.

groundwater: subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

guideline: a recommended, non-mandatory, optional practice that is not legislated (*i.e.*, does not have the force of law), but is a statement of desired, good, or best practice. They are often departmental documents that are used to interpret legislation and / or regulation.

hydric soils: soils that are saturated or flooded long enough during the growing season to develop anaerobic conditions in the upper part of the soil that indicate the possibility of wetland presence.

hydrophytic vegetation: plant life capable of growing in wet conditions, such as in water or in soil or other substrate that is periodically saturated with water and whose presence suggests the possibility of a wetland.

Interim Maximum Acceptable Concentration (IMAC): an initially established maximum amount of a parameter that is allowed in a potable drinking water supply, as administered by Health Canada, until a comprehensive review of the known health effects associated with the parameter with respect to exposure levels and on the availability of treatment and analytical technologies can be completed.

lithology: a description of the physical character of a rock as determined by eye or with a low-power magnifier, and based on colour, structures, mineralogic components, and grain size.

lubricants: a substance used to reduce the friction between surfaces or as process materials either incorporated into other materials used as processing aids in the manufacturing of other products, or as carriers for other materials.

Maximum Acceptable Concentration (MAC): the maximum amount of a parameter that is allowed in a potable drinking water supply, as administered by Health Canada, based on a comprehensive review of the known health effects associated with the parameter with respect to exposure levels and on the availability of treatment and analytical technologies.

non-friable: materials that cannot be crumbled, pulverized, or reduced to powder by hand pressure.

parallelogram: a four-side figure with two pairs of parallel and congruent sides.

Parcel / Property IDentification (PID) number: a unique number given to a land parcel for tracking information, such as deed holders, size, environmental issues, *etc.*

perchloroethylene: a volatile organic compound that is used primarily as a dry-cleaning agent. It is toxic and is considered to be carcinogenic.

petroleum hydrocarbons: a family of naturally occurring liquid organic compounds, which after distillation, yields combustible fuels, petrochemicals, and lubricants.

PolyChlorinated Biphenyls (PCBs): a group of synthetic, organic chemical compounds that were once widely used in electrical equipment, specialized hydraulic systems, heat transfer systems, and other industrial products. They are an environmental concern because they are a pervasive and persistent contaminant that is considered highly toxic and carcinogenic.

potable: safe for human consumption, such that it can be used in the preparation of food and beverages or for the cleaning of utensils and dishes used in the preparation of food and beverages.

sanitary waste: liquid or solid waste originating solely from humans and human activities, such as wastes collected from toilets, showers, wash basins, sinks used for cleaning domestic areas, sinks used for food preparation, clothes washing operations, and sinks or washing machines where food and beverage serving dishes, glasses, and utensils are cleaned, but does not include hazardous or radioactive materials.

scope of work: the objective and extent of work to be accomplished for the assignment.

slope: the run to rise of a surface, expressed as a ratio.

solid waste: non-liquid or gaseous waste that can be accepted for disposal in a landfill or incinerator and includes food waste, paper and cardboard, yard waste, metals, plastics, *etc.*, but does not typically include industrial waste, medical waste, or hazardous waste.

terrestrial: relating to or inhabiting the land (*e.g.*, terrestrial plants live on the land as opposed to in the water).

the Work: the tasks and activities required to complete the defined scope of work.

topography: the physical features of a geographical area including relative elevations and the position of natural and anthropogenic features.

ubiquitous: widely present.

watercourse: the full width and length, including the bed, banks, sides and shoreline, or any part of a river, creek, stream, spring, brook, lake, pond, reservoir, canal, ditch, or other natural or artificial channel open to the atmosphere, the primary function of which is the conveyance or containment of water whether the flow be continuous or not.

watershed: an area of land that drains to a single outlet and is separated from other watersheds by a divide.

wetland: land that either periodically or permanently, has a water table at, near, or above the land's surface or that is saturated with water and sustains aquatic processes as indicated by the presence of hydric soils, hydrophytic vegetation, and biological activities adapted to wet conditions.

wellfield: an area containing one or more potable groundwater wells that is used to provide water.

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Appendix I

Parcel Information



Parcel Information

PID:	01332683	County:	Charlotte
Status:	Active	Active Date/Time:	1978-05-09 00:00:00
Land Related Description:	Land	Management Unit:	NB0305
Area:	5.94	Area Unit:	Hectares
Date Last Updated:	2012-01-12 11:13:21	Harmonization Status:	Harmonized
Land Titles Status:	Land Titles	Land Titles Date/Time:	2011-06-16 12:00:06
Date of Last CRO:	2012-10-14 15:46:20	Manner of Tenure:	Not Applicable
Land Gazette Information:	Yes		
Description of Tenure:			
Public Comments:			
MAP / CARTE 06H50, 05H59			
View Map		View Parcel Description	
PID Report		Land Gazette	

Parcel Interest Holders

Name	Qualifier	Interest Type
507773 N.B. LTD		Owner
Barrette Outdoor Living, Inc.		Lessee
Lawrence R. McCoy & Co., Inc.		Lessee

Assessment Reference

PAN	PAN Type	Taxing Authority Code	Taxing Authority
01459414		500	Town of/Ville de St. Stephen

Parcel Locations

Civic Number	Street Name	Street Type	Street Direction	Place Name
30	Progress	Drive		St. Stephen

County Parish

County	Parish
Charlotte	Saint Stephen

Documents

Number	Registration Date	Book	Page	Code	Description
31049860	2012-01-12			2100	Lease, Notice of Lease or Sub-Lease
30218557	2011-06-16			3800	Land Titles First Notice
30218540	2011-06-16			3720	Land Titles First Order
30217393	2011-06-16			3900	Land Titles First Application
29581676	2010-12-09			5110	Collateral Mortgage
28545714	2010-03-31			2100	Lease, Notice of Lease or Sub-Lease
10182237	1999-04-20	685	425	5100	Mortgage
10177377	1999-04-19	685	277	5100	Mortgage
10177344	1999-04-19	685	272	1100	Deed/Transfer
142349	1998-09-17	667	599	119	Other
132305	1995-08-25	578	38	114	Agreement
123177	1992-09-17	501	566	107	Discharge
110659	1988-10-13	388	335	101	Deed
109994	1988-08-16	382	545	111	Judgment
109952	1988-08-10	382	306	111	Judgment
108730	1988-04-05	372	337	111	Judgment
105701	1987-04-23	346	485	103	Debenture, Voluntary Charge
104927	1987-01-08	338	426	107	Discharge
104908	1987-01-06	338	331	103	Debenture, Voluntary Charge
104627	1986-12-12	334	491	111	Judgment
101945	1986-01-03	313	876	119	Other
					Debenture,

101849	1985-12-11	313	393	103	Voluntary Charge
101769	1985-11-29	313	4	101	Deed
101768	1985-11-29	313	1	107	Discharge
94928	1983-05-11	280	731	103	Debenture, Voluntary Charge
94927	1983-05-11	280	723	101	Deed
94926	1983-05-11	280	720	112	Power of Attorney
92434	1982-05-12	269	726	120	Lien
92234	1982-04-08	268	948	117	Notice
92229	1982-04-06	268	931	120	Lien
88968	1980-01-01	255	429	103	Debenture, Voluntary Charge
86907	1979-01-01	247	740	103	Debenture, Voluntary Charge
83615	1979-01-01	238	669	101	Deed
83614	1979-01-01	238	664	101	Deed
83613	1979-01-01	238	659	101	Deed
73948	1975-01-01	204	595	101	Deed

Plans

Number	Suffix	Registration Date	Code	Description	Lot Information	Orientation
10650654		1999-11-22	9050	Subdivision & Amalgamations	Lot	Provincial Grid
200779		1998-09-17	9020	Easement or Right-of-Way		Provincial Grid
2122		1975-05-23	9050	Subdivision & Amalgamations		Astronomic
2107		1975-03-26	9050	Subdivision & Amalgamations		Astronomic
2106		1975-03-26	9050	Subdivision & Amalgamations		Astronomic

Parcel Relations

Related PID	Type of Relation	Lot Information
15014525	Infant	

Non-Registered Instruments

No Records returned



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Land Gazette Information for PID: 1332683

The Land Gazette is a repository of permanent and temporary land related notices and associated information.

Data Owner	
New Brunswick Department of the Environment & Local Government	Application For Additional Notice Information
Petroleum Storage Sites	
Notices: Petroleum Storage Site Report	Assigned Date: 2004-05-15 16:22:54
References:	
Remediation Sites Management System	
Notices: New Brunswick's Remediation Sites Management Program Report	Assigned Date: 2006-08-30 15:38:07
References:	

[Land Gazette](#) - View the list of notices currently available in the Land Gazette.

[PDF Report](#)

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Parcel Information

PID:	15031099	County:	Charlotte
Status:	Active	Active Date/Time:	1979-06-15 00:00:00
Land Related Description:	Land	Management Unit:	NB0305
Area:	8.61	Area Unit:	Hectares
Date Last Updated:	2011-06-09 13:23:25	Harmonization Status:	Harmonized
Land Titles Status:	Land Titles	Land Titles Date/Time:	2011-06-09 13:23:11
Date of Last CRO:	2012-10-14 15:46:41	Manner of Tenure:	Not Applicable
Land Gazette Information:	No		
Description of Tenure:			
Public Comments:			
MAP / CARTE 05H59, 05HC4 *!* OTHER/AUTRE Milltown			
View Map		View Parcel Description	
PID Report		Land Gazette	

Parcel Interest Holders

Name	Qualifier	Interest Type
507773 N.B. LTD		Owner

Assessment Reference

PAN	PAN Type	Taxing Authority Code	Taxing Authority
05165198		500	Town of/Ville de St. Stephen

Parcel Locations

Civic Number	Street Name	Street Type	Street Direction	Place Name
	Progress	Drive		St. Stephen

County Parish

County

Charlotte

Parish

Saint Stephen

Documents

Number	Registration Date	Book	Page	Code	Description
30192802	2011-06-09			3800	Land Titles First Notice
30192794	2011-06-09			3720	Land Titles First Order
30192463	2011-06-09			3900	Land Titles First Application
29581676	2010-12-09			5110	Collateral Mortgage
10182237	1999-04-20	685	425	5100	Mortgage
10177377	1999-04-19	685	277	5100	Mortgage
10177344	1999-04-19	685	272	1100	Deed/Transfer
123177	1992-09-17	501	566	107	Discharge
110659	1988-10-13	388	335	101	Deed
109994	1988-08-16	382	545	111	Judgment
109952	1988-08-10	382	306	111	Judgment
108730	1988-04-05	372	337	111	Judgment
105701	1987-04-23	346	485	103	Debenture, Voluntary Charge
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104627	1986-12-12	334	491	111	Judgment
101849	1985-12-11	313	393	103	Debenture, Voluntary Charge
101769	1985-11-29	313	4	101	Deed
101768	1985-11-29	313	1	107	Discharge
94928	1983-05-11	280	731	103	Debenture, Voluntary Charge
94927	1983-05-11	280	723	101	Deed
94926	1983-05-11	280	720	112	Power of Attorney
92434	1982-05-12	269	726	120	Lien
92234	1982-04-08	268	948	117	Notice
					Debenture,

88968	1980-01-01	255	429	103	Voluntary Charge
84507	1979-01-01	241	949	101	Deed
79103	1977-07-11	222	421	101	Deed

Plans

Number	Suffix	Registration Date	Code	Description	Lot Information	Orientation
10605013		1999-11-02	9050	Subdivision & Amalgamations	Lot	Provincial Grid
2733		1979-05-29	9050	Subdivision & Amalgamations		Provincial Grid

Parcel Relations

Related PID	Type of Relation	Lot Information
01307784	Parent	

Non-Registered Instruments

No Records returned



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Land Gazette Information for PID: 15031099

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No Records returned

[Land Gazette](#) - View the list of notices currently available in the Land Gazette.

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Appendix II

Regulatory Information

November 21, 2012
File No.: 100-05-R4

Fundy Engineering
27 Wellington Row
Saint John, NB E2L 4S1
Attention: Richard Casey

Your File Ref#: 12-9687

RE: Owner: 507773 N. B Ltd.
Location: Progress Dr., St. Stephen
PID#: 01332683 & 15031099

In response to your request for property-based environmental information regarding the above noted properties, please be advised that a search of related departmental electronic databases has been conducted *with the information provided*, and the following information was found.

There is no record of Ministerial Orders or Remediation Orders related to these PID numbers.

Petroleum storage tank information related to **PID # 01332683** is attached. With respect to the remaining PID numbers, our records indicate that there are no petroleum storage tanks registered with the Department, under the Petroleum Product Storage and Handling Regulation.

Our records indicate that there has been contamination found at **Church St., St. Stephen, Former Foundry (PID# 01332683)**. See attached information report.

These PID numbers are not registered with the Department as PCB Storage sites.

We have no records of landfill sites or former dumpsites located near these PID numbers.

The absence of departmental records in this search does not necessarily indicate that the sites have not been subject to environmental incidents. The information is accurate in that it provides a factual reflection of what is contained in departmental databases. The files themselves may or may not be complete. As an example, in the case of underground petroleum storage tanks, the files accurately reflect all those that were registered with the program; there may be underground storage tanks that were not registered and of which the Department has no knowledge. Likewise, there may be incidents of spills of which the Department was not informed or which pre-date Departmental records. "Remediation Site Management System" was established in the early 2000's and does not contain a complete history of past spills or remediation efforts. Furthermore, if the properties have been recently altered, the PID#'s provided may not correspond with those contained in departmental files and thus on the databases.





SIRS Search Result

Petroleum Storage (PID 01332683)

PID #: 1332683

Site #: 7320

Address:

SWP INDUSTRIES INC
30 PROGRESS AVENUE
ST. STEPHEN

Tank Information

Current Status Removed
Date Out of Service 1998-12-29
Installation Date 1972
Tank Size 45460 L
Location Under Ground
Constructed Of Single Wall Steel
Substance Stored Furnace Oil

Current Status Active
Date Out of Service
Installation Date 2000
Tank Size 1893 L
Location Above Ground
Constructed Of Double Wall Steel
Substance Stored Diesel

Current Status Active
Date Out of Service
Installation Date 2001
Tank Size 9092 L
Location Above Ground
Constructed Of Double Wall Steel
Substance Stored Furnace Oil

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Appendix III

Qualifications of the Assessors



ENVIRONMENTAL ENGINEERING TEAM

ENVIRONMENTAL ENGINEERING SERVICES TEAM

Tim A. Ryan, M.Eng., P.Eng., P.E., LEED® AP

Senior Environmental Engineer / Project Manager, Environmental Director, Saint John Office

Since starting with Fundy Engineering in January 1996, Mr. Tim Ryan has been **“Serving Our Clients’ Needs First”**. He obtained his Bachelor of Civil Engineering in 1990 from the University of Waterloo and then went on to graduate from the Masters of Civil Engineering program at the University of New Brunswick in 1996. He is a registered Professional Engineer in New Brunswick, Prince Edward Island, Nova Scotia, and in the state of Maine. In 2008 Mr. Ryan became a LEED® Accredited Professional (Consultant) through the Canadian Green Building Council.

Mr. Ryan is Fundy Engineering’s Environmental Team Director. His expertise includes site professional services, site remediation, environmental impact assessments, project management, environmental permitting, contaminant hydrogeology, Phase I and Phase II environmental site assessments, clean water initiatives, hydrogeology, and project assessment. Some noteworthy projects Mr. Ryan has managed include: environmental impact assessment, permitting, monitoring, and compliance for portions of the \$750 million (USD) Canaport™ LNG_{LP} Marine Terminal and Multi-Purpose Pier Project, the first in eastern North America to be developed; environmental impact assessment, permitting, monitoring, and compliance for the Red Head Secondary Access Road, a new roadway for citizens in the unstable slope area of Red Head; environmental analysis and permitting for the ultra-low sulphur diesel pipeline between the Irving Oil Limited Refinery and the East Saint John Terminal; obtaining environmental permits associated with the qplex™ development in Quispamsis, a multi-purpose recreation and conference centre that features some of the most progressive green building initiatives in the region; and undertaking high-level mapping of potential energy investments throughout southwestern New Brunswick for Enterprise Saint John.

Greg S. Derrah, P.Tech., CESA

Senior Environmental Engineering Technologist, Saint John Office

Mr. Greg Derrah graduated with a diploma in Environmental Technology from the Miramichi campus of the New Brunswick Community College in 1999. He joined Fundy Engineering’s Environmental Team in June 1999 and is a practicing Professional Technologist in New Brunswick. In 2006 he became a Certified Environmental Site Assessor after completing the Phase I environmental site assessor course. Mr. Derrah’s expertise comprises project management, environmental field work, contaminant hydrogeology, risk-management of contaminated sites, indoor air quality, clean water initiatives, soil testing, concrete inspection, surveying, and AutoCAD. He has an extensive resume of Phase I and Phase II environmental site assessments and site professional services for properties throughout Atlantic Canada, including: site remediation of a former maintenance garage in Campobello; containment and risk-management of contaminated soils on the former McKnight Motors property in east Saint John; site professional services for the abatement of lead-based paints within former warehouses in Perth Andover; and delineation and remediation of a fuel oil release to a fractured bedrock aquifer in Grand Bay-Westfield.



Stephen Little, P.Tech., CESA
Intermediate Environmental Engineering Technologist, Saint John Office

Mr. Stephen Little graduated in 2007 from the Environmental Technology program at the Miramichi campus of the New Brunswick Community College. After completing a practicum with Fundy Engineering, he was hired full-time in July 2007 and is practicing as a New Brunswick Professional Technologist. In 2010 he became a Certified Environmental Site Assessor after completing the Phase I environmental site assessor course. Mr. Little has experience in AutoCAD, Geographic Information Systems (GIS), report writing, Phase I and Phase II environmental site assessments, and field and laboratory work. Since joining us he has participated in several high-profile jobs, including: the hazardous materials assessment and professional services for abatement of asbestos of the former YMCA in Saint John; completing field work for Phase I and Phase II environmental site assessments on Long Wharf for determining potential environmental liabilities prior to the construction of the Irving Oil head office; and using GIS as a tool for developing high-level mapping for potentially locating energy investments in Saint John.

Where can I get additional information?

If you require any additional information about Fundy Engineering, please contact our offices toll free at 1.877.635.1566 or visit us online at www.fundyeng.com.



AECOM

Appendix D

Photograph Log



Photo 1: View of the forest and vegetation to the northwest of the property



Photo 2: View of the wetland area north of the property



Photo 3: View of the wetland area north of the property



Photo 4: View of the northern portion of the property near the wetland area



Photo 5: View Doodle Brook



Photo 6: View Doodle Brook



Photo 7: View Doodle Brook



Photo 8: View Doodle Brook



Photo 9: View of wetland area north of the property



AECOM

Appendix E

**Atlantic Canada
Conservation Data Centre
(ACCDC) Report**



DATA REPORT 5540: St Stephen, NB

Prepared 14 April 2016
by J. Churchill, Data Manager

CONTENTS OF REPORT

1.0 Preface

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

2.0 Rare and Endangered Species

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

3.0 Special Areas

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

4.0 Rare Species Lists

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

5.0 Rare Species within 100 km

- 5.1 Source Bibliography



Map 1. A 100 km buffer around the study area

1.0 PREFACE

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

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

1.1 DATA LIST

Included datasets:

Filename	Contents
StStephenNB_5540ob.xls	All Rare and legally protected <i>Flora and Fauna</i> within 5 km of your study area
StStephenNB_5540ob100km.xls	A list of Rare and legally protected <i>Flora and Fauna</i> within 100 km of your study area
StStephenNB_5540sa.xls	All <i>Significant Natural Areas</i> in your study area
StStephenNB_5540ff.xls	Rare and common <i>Freshwater Fish</i> in your study area (DFO database)

1.2 RESTRICTIONS

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

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

1.3 ADDITIONAL INFORMATION

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

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

Plants, Lichens, Ranking Methods, All other Inquiries

Sean Blaney, Senior Scientist, Executive Director

Tel: (506) 364-2658

sblaney@mta.ca

Animals (Fauna)

John Klymko, Zoologist

Tel: (506) 364-2660

jklymko@mta.ca

Plant Communities

Sarah Robinson, Community Ecologist

Tel: (506) 364-2664

srobinson@mta.ca

Data Management, GIS

James Churchill, Data Manager

Tel: (902) 679-6146

jlchurchill@mta.ca

Billing

Jean Breau

Tel: (506) 364-2657

jrbreau@mta.ca

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

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

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

Western: Duncan Bayne

(902) 648-3536

baynedz@gov.ns.ca

Western: Donald Sam

(902) 634-7525

samdx@gov.ns.ca

Central: Shavonne Meyer

(902) 893-6353

meyersj@gov.ns.ca

Central: Kimberly George

(902) 893-5630

georgeka@gov.ns.ca

Eastern: Mark Pulsifer

(902) 863-7523

pulsifmd@gov.ns.ca

Eastern: Donald Anderson

(902) 295-3949

andersdg@gov.ns.ca

Eastern: Terry Power

(902) 563-3370

powertd@gov.ns.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

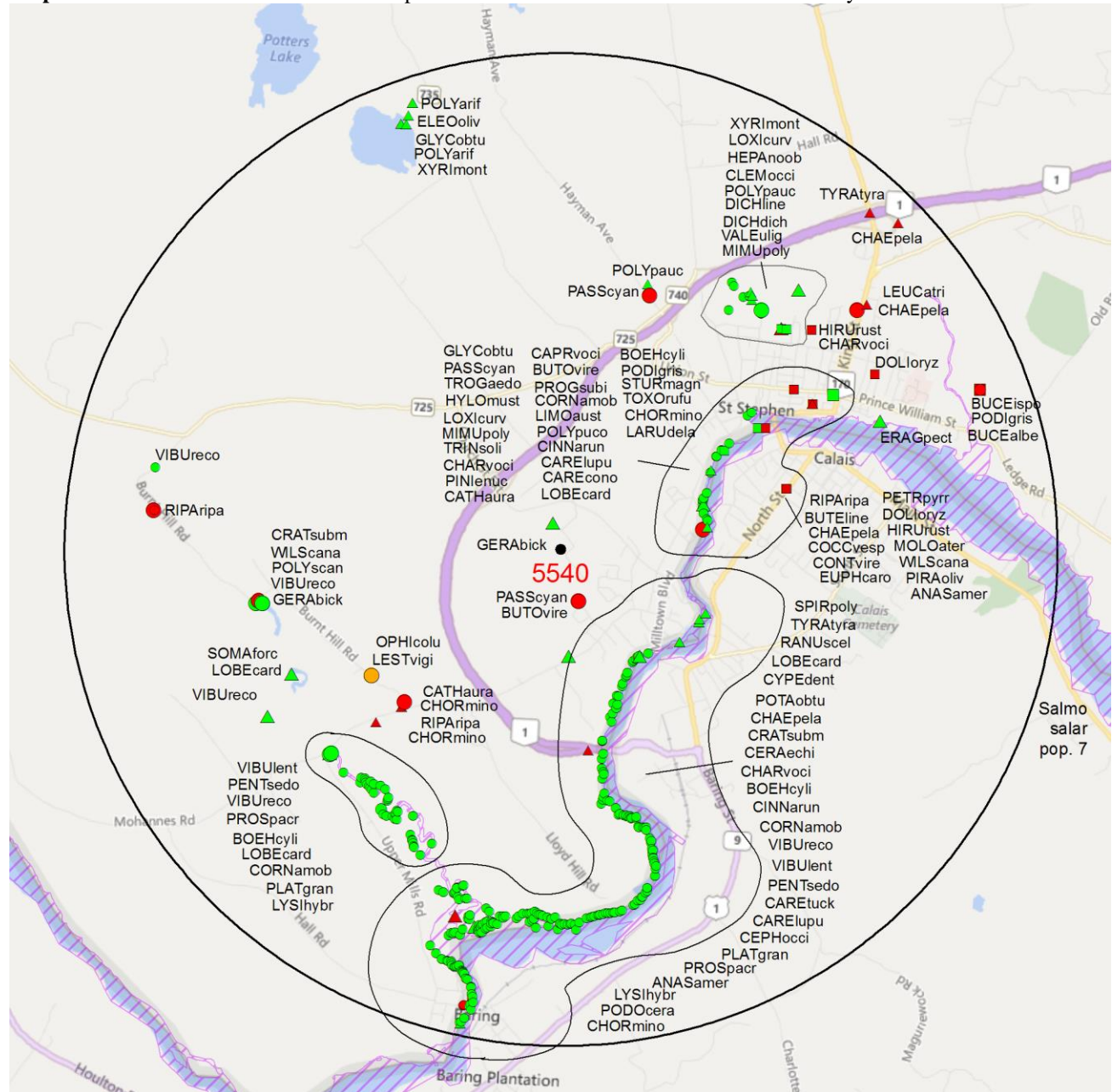
2.1 FLORA

A 5 km buffer around the study area contains 375 records of 36 vascular, no records of nonvascular flora (Map 2 and attached: *ob.xls).

2.2 FAUNA

A 5 km buffer around the study area contains 121 records of 34 vertebrate, 3 records of 3 invertebrate fauna (Map 2 and attached data files - see 1.1 Data List). Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

Map 2: Known observations of rare and/or protected flora and fauna within 5 km of the study area.



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

- HIGHER TAXON**
- vertebrate fauna
 - invertebrate fauna
 - vascular flora
 - nonvascular flora

Salmo salar pop. 7

3.0 SPECIAL AREAS

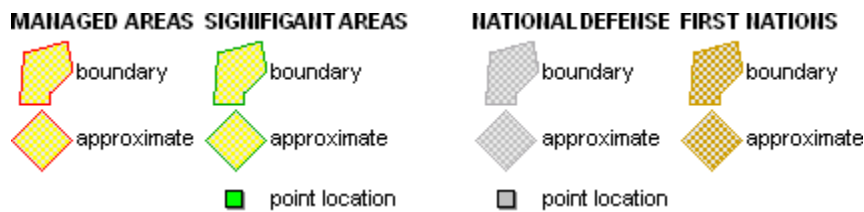
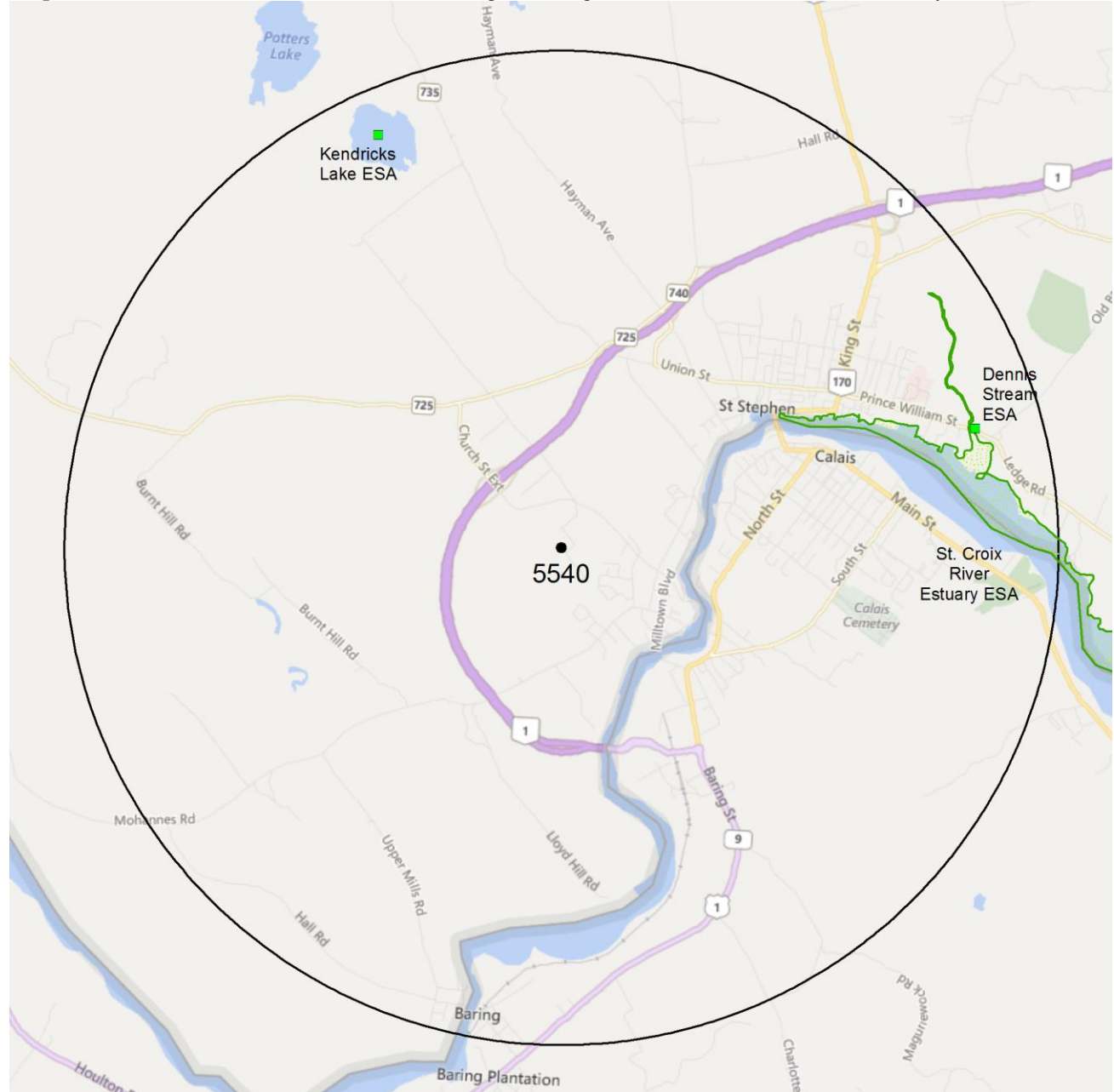
3.1 MANAGED AREAS

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

3.2 SIGNIFICANT AREAS

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

Map 3: Boundaries and/or locations of known Managed and Significant Areas within 5 km of the study area.



4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding “location-sensitive” species, section 4.3) within the 5 km-buffered area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (\pm the precision, in km, of the record). [P] = vascular plant, [N] = nonvascular plant, [A] = vertebrate animal, [I] = invertebrate animal, [C] = community. Note: records are from attached files *ob.xls/*ob.shp only.

4.1 FLORA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
P	<i>Lysimachia hybrida</i>	Lowland Yellow Loosestrife				S1	2 May Be At Risk	12	3.0 \pm 0.0
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S1	2 May Be At Risk	2	1.6 \pm 0.0
P	<i>Eleocharis olivacea</i>	Yellow Spikerush				S1	2 May Be At Risk	2	4.6 \pm 0.0
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S1	2 May Be At Risk	17	1.3 \pm 0.0
P	<i>Dichanthelium dichotomum</i>	Forked Panic Grass				S1	2 May Be At Risk	4	3.1 \pm 0.0
P	<i>Glyceria obtusa</i>	Atlantic Manna Grass				S1	2 May Be At Risk	3	3.2 \pm 10.0
P	<i>Viburnum lentago</i>	Nannyberry				S2	4 Secure	22	3.0 \pm 0.0
P	<i>Viburnum recognitum</i>	Northern Arrow-Wood				S2	4 Secure	79	1.5 \pm 0.0
P	<i>Polygala paucifolia</i>	Fringed Milkwort				S2	3 Sensitive	2	2.8 \pm 0.0
P	<i>Podostemum ceratophyllum</i>	Horn-leaved Riverweed				S2	3 Sensitive	9	4.4 \pm 0.0
P	<i>Hepatica nobilis</i> var. <i>obtusata</i>	Round-lobed Hepatica				S2	3 Sensitive	2	3.1 \pm 0.0
P	<i>Cephalanthus occidentalis</i>	Common Buttonbush				S2	3 Sensitive	5	1.4 \pm 0.0
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S2	3 Sensitive	4	2.9 \pm 0.0
P	<i>Proserpinaca palustris</i> var. <i>crebra</i>	Marsh Mermaidweed				S2?	3 Sensitive	2	3.4 \pm 0.0
P	<i>Eragrostis pectinacea</i>	Tufted Love Grass				S2?	4 Secure	1	3.5 \pm 1.0
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S2S3	3 Sensitive	1	2.3 \pm 0.0
P	<i>Valeriana uliginosa</i>	Swamp Valerian				S2S3	3 Sensitive	1	3.5 \pm 1.0
P	<i>Lobelia cardinalis</i>	Cardinal Flower				S3	4 Secure	32	1.5 \pm 0.0
P	<i>Cornus amomum</i> ssp. <i>obliqua</i>	Pale Dogwood				S3	3 Sensitive	48	1.3 \pm 0.0
P	<i>Penthorum sedoides</i>	Ditch Stonecrop				S3	4 Secure	12	1.6 \pm 0.0
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	4 Secure	2	0.3 \pm 1.0
P	<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb				S3	4 Secure	2	4.7 \pm 0.0
P	<i>Polygonum punctatum</i> var. <i>confertiflorum</i>	Dotted Smartweed				S3	4 Secure	1	1.8 \pm 0.0
P	<i>Polygonum scandens</i>	Climbing False Buckwheat				S3	4 Secure	2	3.1 \pm 0.0
P	<i>Clematis occidentalis</i>	Purple Clematis				S3	4 Secure	2	3.2 \pm 0.0
P	<i>Limosella australis</i>	Southern Mudwort				S3	4 Secure	1	2.3 \pm 5.0
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S3	3 Sensitive	62	1.3 \pm 0.0
P	<i>Carex conoidea</i>	Field Sedge				S3	4 Secure	1	1.5 \pm 0.0
P	<i>Carex lupulina</i>	Hop Sedge				S3	4 Secure	25	1.3 \pm 0.0
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S3	4 Secure	4	3.0 \pm 0.0
P	<i>Cyperus dentatus</i>	Toothed Flatsedge				S3	4 Secure	1	1.6 \pm 0.0
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	3 Sensitive	4	3.3 \pm 0.0
P	<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed				S3	4 Secure	1	1.3 \pm 0.0
P	<i>Xyris montana</i>	Northern Yellow-Eyed-Grass				S3	4 Secure	4	3.1 \pm 6.0
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S3?	3 Sensitive	2	1.1 \pm 1.0
P	<i>Spirodela polyrrhiza</i>	Great Duckweed				S3S4	4 Secure	1	4.9 \pm 0.0

4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Hyllocichla mustelina</i>	Wood Thrush	Threatened		Threatened	S1S2B	2 May Be At Risk	4	2.4 \pm 7.0
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened		Threatened	S1S2B	2 May Be At Risk	1	2.8 \pm 7.0
A	<i>Caprimulgus vociferus</i>	Whip-Poor-Will	Threatened	Threatened	Threatened	S2B	1 At Risk	3	2.4 \pm 7.0
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Threatened	S2S3B	1 At Risk	11	1.3 \pm 0.0
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S3B	1 At Risk	14	2.3 \pm 0.0

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Threatened	S3B	3 Sensitive	5	2.4 ± 7.0
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S3B	3 Sensitive	10	2.2 ± 0.0
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Threatened	S3S4B	1 At Risk	4	2.4 ± 7.0
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Threatened	S3S4B	3 Sensitive	3	2.4 ± 7.0
A	<i>Bucephala islandica (Eastern pop.)</i>	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern	Special Concern	S2N	3 Sensitive	1	4.5 ± 15.0
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Special Concern	S3B	2 May Be At Risk	1	2.4 ± 7.0
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Special Concern	S4B	4 Secure	2	2.4 ± 7.0
A	<i>Buteo lineatus</i>	Red-shouldered Hawk	Not At Risk	Special Concern		S2B	2 May Be At Risk	1	2.4 ± 7.0
A	<i>Podiceps grisegena</i>	Red-necked Grebe	Not At Risk			S3M,S2N	3 Sensitive	2	2.9 ± 5.0
A	<i>Leucophaeus atricilla</i>	Laughing Gull				S1B	3 Sensitive	1	3.9 ± 0.0
A	<i>Troglodytes aedon</i>	House Wren				S1B	5 Undetermined	3	2.4 ± 7.0
A	<i>Butorides virescens</i>	Green Heron				S1S2B	3 Sensitive	3	0.6 ± 0.0
A	<i>Progne subis</i>	Purple Martin				S1S2B	2 May Be At Risk	1	2.8 ± 7.0
A	<i>Toxostoma rufum</i>	Brown Thrasher				S2B	3 Sensitive	2	2.4 ± 7.0
A	<i>Tringa solitaria</i>	Solitary Sandpiper				S2B,S5M	4 Secure	1	2.9 ± 0.0
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S2S3B,S4S5N	3 Sensitive	1	2.8 ± 7.0
A	<i>Loxia curvirostra</i>	Red Crossbill				S3	4 Secure	5	2.4 ± 7.0
A	<i>Anas americana</i>	American Wigeon				S3B	4 Secure	3	2.4 ± 7.0
A	<i>Cathartes aura</i>	Turkey Vulture				S3B	4 Secure	7	2.3 ± 0.0
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	5	2.0 ± 0.0
A	<i>Larus delawarensis</i>	Ring-billed Gull				S3B	4 Secure	3	2.4 ± 5.0
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S3B	3 Sensitive	4	2.4 ± 7.0
A	<i>Passerina cyanea</i>	Indigo Bunting				S3B	4 Secure	6	0.6 ± 0.0
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S3B	2 May Be At Risk	2	2.4 ± 7.0
A	<i>Bucephala albeola</i>	Bufflehead				S3N	3 Sensitive	1	4.5 ± 15.0
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3S4B	3 Sensitive	5	2.4 ± 7.0
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S3S4B	3 Sensitive	4	2.3 ± 7.0
A	<i>Piranga olivacea</i>	Scarlet Tanager				S3S4B	4 Secure	1	2.4 ± 7.0
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak				S3S4B,S4S5N	3 Sensitive	1	2.4 ± 7.0
I	<i>Ophiogomphus colubrinus</i>	Boreal Snaketail				S1S2	2 May Be At Risk	1	2.3 ± 0.0
I	<i>Somatochlora forcipata</i>	Forcipate Emerald				S3	4 Secure	1	2.3 ± 0.0
I	<i>Lestes vigilax</i>	Swamp Spreadwing				S3	3 Sensitive	1	2.3 ± 0.0

4.3 LOCATION SENSITIVE SPECIES

The Department of Natural Resources in each Maritimes province considers a number of species “location sensitive”. Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in this report. Those intersecting a 5 km buffer of your study area are indicated below with “YES”.

New Brunswick

Scientific Name	Common Name	SARA	Prov Legal Prot	Known within 5 km of Study Site?
<i>Chrysemys picta picta</i>	Eastern Painted Turtle			No
<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	YES
<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	No
<i>Haliaeetus leucocephalus</i>	Bald Eagle		Endangered	YES
<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Endangered	No
<i>Cicindela marginipennis</i>	Cobblestone Tiger Beetle	Endangered	Endangered	No
<i>Coenonympha nipisiquit</i>	Maritime Ringlet	Endangered	Endangered	No
<i>Bat Hibernaculum</i>		[Endangered]¹	[Endangered]¹	YES

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

4.4 SOURCE BIBLIOGRAPHY

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

# recs	CITATION
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5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 16808 records of 130 vertebrate and 455 records of 54 invertebrate fauna; 4394 records of 325 vascular, 148 records of 85 nonvascular flora (attached: *ob100km.xls).

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

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	30	1.6 \pm 1.0	NB
A	<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	11	82.4 \pm 1.0	NB
A	<i>Perimyotis subflavus</i>	Eastern Pipistrelle	Endangered	Endangered	Endangered	S1	1 At Risk	2	93.3 \pm 0.0	NB
A	<i>Eubalaena glacialis</i>	North Atlantic Right Whale	Endangered	Endangered	Endangered	S1		6	32.5 \pm 1.0	NB
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	1 At Risk	21	22.1 \pm 5.0	NB
A	<i>Dermodochelys coriacea</i> (Atlantic pop.)	Leatherback Sea Turtle - Atlantic pop.	Endangered	Endangered	Endangered	S1S2N	1 At Risk	3	72.8 \pm 0.0	NB
A	<i>Morone saxatilis</i>	Striped Bass	Endangered			S2	2 May Be At Risk	8	19.7 \pm 1.0	NB
A	<i>Salmo salar</i> pop. 1	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered	Endangered	S2	2 May Be At Risk	3	60.2 \pm 0.0	NB
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S2B	1 At Risk	24	66.2 \pm 0.0	NB
A	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered		Endangered	S3M	1 At Risk	244	22.0 \pm 0.0	NB
A	<i>Pagophila eburnea</i>	Ivory Gull	Endangered	Endangered		SNA	8 Accidental	2	54.2 \pm 12.0	NB
A	<i>Protonotaria citrea</i>	Prothonotary Warbler	Endangered	Endangered		SNA	8 Accidental	4	60.7 \pm 3.0	NB
A	<i>Rangifer tarandus</i> pop. 2	Woodland Caribou (Atlantic-Gasp) [rsie pop.]	Endangered	Endangered	Extirpated	SX	0.1 Extirpated	2	38.9 \pm 1.0	NB
A	<i>Colinus virginianus</i>	Northern Bobwhite	Endangered	Endangered				2	94.6 \pm 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	<i>Ixobrychus exilis</i>	Least Bittern	Threatened	Threatened	Threatened	S1S2B	1 At Risk	5	38.0 ± 0.0	NB
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened		Threatened	S1S2B	2 May Be At Risk	129	2.4 ± 7.0	NB
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened		Threatened	S1S2B	2 May Be At Risk	14	2.8 ± 7.0	NB
A	<i>Caprimulgus vociferus</i>	Whip-Poor-Will	Threatened	Threatened	Threatened	S2B	1 At Risk	51	2.4 ± 7.0	NB
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2S3	1 At Risk	47	18.8 ± 1.0	NB
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Threatened	S2S3B	1 At Risk	126	1.3 ± 0.0	NB
A	<i>Catharus bicknelli</i>	Bicknell's Thrush	Threatened	Special Concern	Threatened	S2S3B	1 At Risk	20	43.3 ± 7.0	NB
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened		Threatened	S3	4 Secure	1	83.9 ± 1.0	NB
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S3B	1 At Risk	176	2.3 ± 5.0	NB
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Threatened	S3B	3 Sensitive	767	2.4 ± 7.0	NB
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S3B	3 Sensitive	242	2.2 ± 0.0	NB
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3S4B	1 At Risk	176	7.8 ± 7.0	NB
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Threatened	S3S4B	1 At Risk	481	2.4 ± 7.0	NB
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Threatened	S3S4B	3 Sensitive	266	2.4 ± 7.0	NB
A	<i>Anguilla rostrata</i>	American Eel	Threatened		Threatened	S5	4 Secure	33	19.7 ± 1.0	NB
A	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Threatened	Threatened		SNA	8 Accidental	9	31.8 ± 7.0	NB
A	<i>Vermivora chrysoptera</i>	Golden-winged Warbler	Threatened	Threatened		SNA	8 Accidental	1	79.7 ± 1.0	NB
A	<i>Wilsonia citrina</i>	Hooded Warbler	Threatened	Threatened		SNA	8 Accidental	4	80.2 ± 1.0	NB
A	<i>Osmerus mordax</i> pop. 2	Lake Utopia Smelt large-bodied pop.	Threatened		Threatened			2	40.1 ± 1.0	NB
A	<i>Falco peregrinus</i> pop. 1	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Endangered	S1B	1 At Risk	506	17.9 ± 0.0	NB
A	<i>Histrionicus histrionicus</i> pop. 1	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S1B,S1N	1 At Risk	199	44.4 ± 12.0	NB
A	<i>Acipenser brevirostrum</i>	Shortnose Sturgeon	Special Concern	Special Concern	Special Concern	S2	3 Sensitive	2	91.7 ± 10.0	NB
A	<i>Bucephala islandica</i> (Eastern pop.)	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern	Special Concern	S2N	3 Sensitive	37	4.5 ± 15.0	NB
A	<i>Balaenoptera physalus</i>	Fin Whale - Atlantic pop.	Special Concern	Special Concern	Special Concern	S2S3	3	69.1 ± 0.0	NB	
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Special Concern	S3	3 Sensitive	21	3.0 ± 0.0	NB
A	<i>Asio flammeus</i>	Short-eared Owl	Special Concern	Special Concern	Special Concern	S3B	3 Sensitive	13	64.9 ± 7.0	NB
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Special Concern	S3B	2 May Be At Risk	104	2.4 ± 7.0	NB
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern			S3M	3 Sensitive	220	21.9 ± 0.0	NB
A	<i>Phocoena phocoena</i> (NW Atlantic pop.)	Harbour Porpoise - Northwest Atlantic pop.	Special Concern	Threatened		S4		210	18.3 ± 100.0	NB
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Special Concern	S4B	4 Secure	237	2.4 ± 7.0	NB
A	<i>Podiceps auritus</i>	Horned Grebe	Special Concern		Special Concern	S4M,S4N	4 Secure	264	21.1 ± 3.0	NB
A	<i>Tryngites subruficollis</i>	Buff-breasted Sandpiper	Special Concern			SNA	8 Accidental	49	46.6 ± 0.0	NB
A	<i>Falco rusticolus</i>	Gyr Falcon	Not At Risk			S1N	5 Undetermined	15	60.5 ± 1.0	NB
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1S2B	2 May Be At Risk	11	35.6 ± 7.0	NB
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S1S2B	2 May Be At Risk	3	66.7 ± 1.0	NB
A	<i>Sorex dispar</i>	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	2	91.9 ± 1.0	NB
A	<i>Buteo lineatus</i>	Red-shouldered Hawk	Not At Risk	Special Concern		S2B	2 May Be At Risk	34	2.4 ± 7.0	NB
A	<i>Fulica americana</i>	American Coot	Not At Risk			S2B	3 Sensitive	2	43.3 ± 7.0	NB
A	<i>Chlidonias niger</i>	Black Tern	Not At Risk			S2B	3 Sensitive	9	22.2 ± 7.0	NB
A	<i>Globicephala melas</i>	Long-finned Pilot Whale	Not At Risk			S2S3		1	61.3 ± 1.0	NB
A	<i>Lynx canadensis</i>	Canadian Lynx	Not At Risk		Endangered	S3	1 At Risk	7	14.2 ± 1.0	NB
A	<i>Desmognathus fuscus</i> (QC/NB pop.)	Northern Dusky Salamander - QC/NB pop.	Not At Risk			S3	3 Sensitive	88	18.8 ± 1.0	NB
A	<i>Megaptera novaeangliae</i>	Humpback Whale (NW Atlantic pop.)	Not At Risk	Special Concern		S3		3	32.5 ± 5.0	NB
A	<i>Haliaeetus leucocephalus</i>	Bald Eagle	Not At Risk		Endangered	S3B	1 At Risk	1141	2.2 ± 0.0	NB
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	3 Sensitive	241	22.3 ± 0.0	NB
A	<i>Podiceps grisegena</i>	Red-necked Grebe	Not At Risk			S3M,S2N	3 Sensitive	668	2.9 ± 5.0	NB
A	<i>Canis lupus</i>	Gray Wolf	Not At Risk		Extirpated	SX	0.1 Extirpated	3	66.3 ± 1.0	NB
A	<i>Lepomis auritus</i>	Redbreast Sunfish	Data Deficient	Special Concern		S3?	4 Secure	26	38.5 ± 10.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Puma concolor pop. 1</i>	Cougar - Eastern pop.	Data Deficient		Endangered	SU	5 Undetermined	36	13.9 ± 1.0	NB
A	<i>Lasionycteris noctivagans</i>	Silver-haired Bat				S1?	5 Undetermined	1	96.0 ± 1.0	NB
A	<i>Bartramia longicauda</i>	Upland Sandpiper				S1B	3 Sensitive	41	32.3 ± 7.0	NB
A	<i>Phalaropus tricolor</i>	Wilson's Phalarope				S1B	3 Sensitive	42	48.5 ± 1.0	NB
A	<i>Leucophaeus atricilla</i>	Laughing Gull				S1B	3 Sensitive	85	3.9 ± 0.0	NB
A	<i>Sterna paradisaea</i>	Arctic Tern				S1B	2 May Be At Risk	147	22.1 ± 5.0	NB
A	<i>Troglodytes aedon</i>	House Wren				S1B	5 Undetermined	24	2.4 ± 7.0	NB
A	<i>Aythya marila</i>	Greater Scaup				S1B,S2N	4 Secure	14	23.4 ± 2.0	NB
A	<i>Uria aalge</i>	Common Murre				S1B,S3N	4 Secure	139	30.5 ± 0.0	NB
A	<i>Alca torda</i>	Razorbill				S1B,S3N	4 Secure	177	35.4 ± 0.0	NB
A	<i>Oxyura jamaicensis</i>	Ruddy Duck				S1B,S4N	4 Secure	41	57.9 ± 0.0	NB
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S1B,S4N	4 Secure	48	37.6 ± 7.0	NB
A	<i>Butorides virescens</i>	Green Heron				S1S2B	3 Sensitive	12	0.6 ± 0.0	NB
A	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1S2B	3 Sensitive	60	34.2 ± 11.0	NB
A	<i>Gallinula chloropus</i>	Common Moorhen				S1S2B	3 Sensitive	9	38.2 ± 5.0	NB
A	<i>Fratercula arctica</i>	Atlantic Puffin				S1S2B	3 Sensitive	182	27.7 ± 0.0	NB
A	<i>Empidonax traillii</i>	Willow Flycatcher				S1S2B	3 Sensitive	39	19.7 ± 2.0	NB
A	<i>Progne subis</i>	Purple Martin				S1S2B	2 May Be At Risk	85	2.8 ± 7.0	NB
A	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow				S1S2B	2 May Be At Risk	21	16.1 ± 7.0	NB
A	<i>Prosopium cylindraceum</i>	Round Whitefish				S2	4 Secure	2	41.8 ± 10.0	NB
A	<i>Salmo salar</i>	Atlantic Salmon				S2	2 May Be At Risk	36	5.3 ± 1.0	NB
A	<i>Lasiurus borealis</i>	Eastern Red Bat				S2?	5 Undetermined	9	23.1 ± 1.0	NB
A	<i>Lasiurus cinereus</i>	Hoary Bat				S2?	5 Undetermined	8	2.4 ± 10.0	NB
A	<i>Oceanodroma leucorhoa</i>	Leach's Storm-Petrel				S2B	3 Sensitive	137	30.5 ± 0.0	NB
A	<i>Anas clypeata</i>	Northern Shoveler				S2B	4 Secure	21	23.4 ± 3.0	NB
A	<i>Anas strepera</i>	Gadwall				S2B	4 Secure	61	23.4 ± 3.0	NB
A	<i>Eremophila alpestris</i>	Horned Lark				S2B	2 May Be At Risk	22	29.7 ± 7.0	NB
A	<i>Cistothorus palustris</i>	Marsh Wren				S2B	3 Sensitive	14	77.6 ± 0.0	NB
A	<i>Toxostoma rufum</i>	Brown Thrasher				S2B	3 Sensitive	75	2.4 ± 7.0	NB
A	<i>Poocetes gramineus</i>	Vesper Sparrow				S2B	2 May Be At Risk	45	6.1 ± 0.0	NB
A	<i>Tringa solitaria</i>	Solitary Sandpiper				S2B,S5M	4 Secure	231	2.9 ± 0.0	NB
A	<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S2M,S1N	3 Sensitive	38	30.5 ± 0.0	NB
A	<i>Somateria spectabilis</i>	King Eider				S2N	4 Secure	55	24.7 ± 0.0	NB
A	<i>Asio otus</i>	Long-eared Owl				S2S3	5 Undetermined	18	40.5 ± 1.0	NB
A	<i>Tringa semipalmata</i>	Willet				S2S3B	3 Sensitive	146	23.4 ± 2.0	NB
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S2S3B,S4S5N	3 Sensitive	17	2.8 ± 7.0	NB
A	<i>Branta bernicla</i>	Brant				S2S3M,S2S3N	4 Secure	536	19.7 ± 1.0	NB
A	<i>Uria lomvia</i>	Thick-billed Murre				S2S3N	5 Undetermined	65	36.4 ± 0.0	NB
A	<i>Cephus grylle</i>	Black Guillemot				S3	4 Secure	768	12.2 ± 16.0	NB
A	<i>Loxia curvirostra</i>	Red Crossbill				S3	4 Secure	88	2.4 ± 7.0	NB
A	<i>Coregonus clupeaformis</i>	Lake Whitefish				S3	4 Secure	12	47.8 ± 10.0	NB
A	<i>Salvelinus namaycush</i>	Lake Trout				S3	3 Sensitive	6	17.9 ± 0.0	NB
A	<i>Sorex maritimensis</i>	Maritime Shrew				S3	4 Secure	1	89.5 ± 1.0	NB
A	<i>Eptesicus fuscus</i>	Big Brown Bat				S3	3 Sensitive	22	3.1 ± 1.0	NB
A	<i>Picoides dorsalis</i>	American Three-toed Woodpecker				S3?	3 Sensitive	9	22.1 ± 7.0	NB
A	<i>Anas acuta</i>	Northern Pintail				S3B	3 Sensitive	10	54.7 ± 2.0	NB
A	<i>Anas americana</i>	American Wigeon				S3B	4 Secure	314	2.4 ± 7.0	NB
A	<i>Cathartes aura</i>	Turkey Vulture				S3B	4 Secure	187	2.3 ± 2.0	NB
A	<i>Rallus limicola</i>	Virginia Rail				S3B	3 Sensitive	33	20.7 ± 0.0	NB
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	579	2.0 ± 0.0	NB
A	<i>Larus delawarensis</i>	Ring-billed Gull				S3B	4 Secure	163	2.4 ± 5.0	NB

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A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S3B	3 Sensitive	88	7.8 ± 7.0	NB
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S3B	3 Sensitive	97	2.4 ± 7.0	NB
A	<i>Passerina cyanea</i>	Indigo Bunting				S3B	4 Secure	79	0.6 ± 0.0	NB
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S3B	2 May Be At Risk	122	2.4 ± 7.0	NB
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3B,S4S5N	4 Secure	346	12.2 ± 16.0	NB
A	<i>Pluvialis dominica</i>	American Golden-Plover				S3M	3 Sensitive	261	23.0 ± 0.0	NB
A	<i>Phalaropus fulicarius</i>	Red Phalarope				S3M	3 Sensitive	120	31.9 ± 0.0	NB
A	<i>Melanitta nigra</i>	Black Scoter				S3M,S2S3N	3 Sensitive	755	12.2 ± 16.0	NB
A	<i>Calidris maritima</i>	Purple Sandpiper				S3M,S3N	4 Secure	255	24.7 ± 0.0	NB
A	<i>Bucephala albeola</i>	Bufflehead				S3N	3 Sensitive	1066	4.5 ± 15.0	NB
A	<i>Synaptomys cooperi</i>	Southern Bog Lemming				S3S4	4 Secure	12	90.8 ± 1.0	NB
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3S4B	3 Sensitive	235	2.4 ± 7.0	NB
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S3S4B	3 Sensitive	321	2.3 ± 7.0	NB
A	<i>Piranga olivacea</i>	Scarlet Tanager				S3S4B	4 Secure	156	2.4 ± 7.0	NB
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak				S3S4B,S4S5N	3 Sensitive	119	2.4 ± 7.0	NB
A	<i>Morus bassanus</i>	Northern Gannet				SHB,S5M,S5N	4 Secure	813	21.2 ± 0.0	NB
A	<i>Lanius ludovicianus</i>	Loggerhead Shrike				SXB,SNAN	1 At Risk	1	70.7 ± 1.0	NB
	<i>Acer saccharinum</i> / <i>Onoclea sensibilis</i> - <i>Lysimachia terrestris</i> Forest	Silver Maple / Sensitive Fern - Swamp Yellow Loosestrife Forest				S3		1	79.3 ± 0.0	
I	<i>Gomphus ventricosus</i>	Skillet Clubtail	Endangered		Endangered	S1S2	2 May Be At Risk	9	97.4 ± 1.0	NB
I	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern		Special Concern	S1S2	3 Sensitive	1	55.3 ± 0.0	NB
I	<i>Ophiogomphus howei</i>	Pygmy Snaketail	Special Concern	Special Concern	Special Concern	S2	2 May Be At Risk	3	36.9 ± 0.0	NB
I	<i>Lampsilis cariosa</i>	Yellow Lampmussel	Special Concern	Special Concern	Special Concern	S2	3 Sensitive	17	79.3 ± 0.0	NB
I	<i>Danaus plexippus</i>	Monarch	Special Concern	Special Concern	Special Concern	S3B	3 Sensitive	63	22.6 ± 0.0	NB
I	<i>Bombus terricola</i>	Yellow-banded Bumblebee	Special Concern			SU	3 Sensitive	7	60.5 ± 0.0	NB
I	<i>Lyogyrus granum</i>	Squat Dusksynail	Data Deficient			S2		5	85.4 ± 0.0	NB
I	<i>Lycaena dorcas</i>	Dorcas Copper				S1	2 May Be At Risk	1	38.5 ± 0.0	NB
I	<i>Lycaena dorcas claytoni</i>	Clayton's Copper				S1	2 May Be At Risk	4	81.0 ± 0.0	NB
I	<i>Somatochlora septentrionalis</i>	Muskeg Emerald				S1	2 May Be At Risk	1	80.3 ± 1.0	NB
I	<i>Celithemis martha</i>	Martha's Pennant				S1	5 Undetermined	1	84.5 ± 0.0	NB
I	<i>Coccinella transversoguttata richardsoni</i>	Transverse Lady Beetle				S1S2	2 May Be At Risk	1	88.6 ± 0.0	NB
I	<i>Plebejus saepiolus</i>	Greenish Blue				S1S2	4 Secure	3	43.3 ± 0.0	NB
I	<i>Ophiogomphus colubrinus</i>	Boreal Snaketail				S1S2	2 May Be At Risk	5	2.3 ± 0.0	NB
I	<i>Satyrrium calanus</i>	Banded Hairstreak				S2	3 Sensitive	2	99.7 ± 0.0	NB
I	<i>Satyrrium calanus falacer</i>	Banded Hairstreak				S2	4 Secure	2	95.6 ± 1.0	NB
I	<i>Strymon melinus</i>	Grey Hairstreak				S2	4 Secure	3	76.4 ± 1.0	NB
I	<i>Aeshna clepsydra</i>	Mottled Darner				S2	3 Sensitive	9	60.6 ± 0.0	NB
I	<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S2	5 Undetermined	5	7.8 ± 1.0	NB
I	<i>Ladona exusta</i>	White Corporal				S2	5 Undetermined	8	13.5 ± 1.0	NB
I	<i>Hetaerina americana</i>	American Rubyspot				S2	3 Sensitive	14	55.3 ± 0.0	NB
I	<i>Coenagrion interrogatum</i>	Subarctic Bluet				S2	3 Sensitive	1	83.7 ± 0.0	NB
I	<i>Ischnura posita</i>	Fragile Forktail				S2	2 May Be At Risk	6	17.7 ± 1.0	NB
I	<i>Alasmidonta undulata</i>	Triangle Floater				S2	3 Sensitive	14	15.1 ± 1.0	NB
I	<i>Anatis labiculata</i>	Fifteen-spotted Lady Beetle				S2S3	3 Sensitive	1	89.1 ± 0.0	NB
I	<i>Chrysops indus</i>	a Tabanid Fly				S2S3	3 Sensitive	2	85.9 ± 0.0	NB

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I	<i>Callophrys henrici</i>	Henry's Elfin				S2S3	4 Secure	3	81.2 ± 0.0	NB
I	<i>Hesperia sassacus</i>	Indian Skipper				S3	4 Secure	3	40.0 ± 0.0	NB
I	<i>Euphyes bimacula</i>	Two-spotted Skipper				S3	4 Secure	8	12.8 ± 1.0	NB
I	<i>Lycaena hyllus</i>	Bronze Copper				S3	3 Sensitive	1	77.2 ± 1.0	NB
I	<i>Satyrium acadica</i>	Acadian Hairstreak				S3	4 Secure	3	13.4 ± 0.0	NB
I	<i>Callophrys polios</i>	Hoary Elfin				S3	4 Secure	1	92.9 ± 0.0	NB
I	<i>Plebejus idas</i>	Northern Blue				S3	4 Secure	6	66.9 ± 0.0	NB
I	<i>Plebejus idas empetri</i>	Crowberry Blue				S3	4 Secure	8	60.8 ± 1.0	NB
I	<i>Speyeria aphrodite</i>	Aphrodite Fritillary				S3	4 Secure	10	47.4 ± 0.0	NB
I	<i>Boloria bellona</i>	Meadow Fritillary				S3	4 Secure	11	46.0 ± 1.0	NB
I	<i>Polygonia satyrus</i>	Satyr Comma				S3	4 Secure	8	19.7 ± 10.0	NB
I	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S3	4 Secure	11	67.5 ± 5.0	NB
I	<i>Gomphus vastus</i>	Cobra Clubtail				S3	3 Sensitive	9	85.6 ± 0.0	NB
I	<i>Gomphus abbreviatus</i>	Spine-crowned Clubtail				S3	4 Secure	27	21.3 ± 1.0	NB
I	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	5 Undetermined	11	7.8 ± 1.0	NB
I	<i>Dorocordulia lepida</i>	Petite Emerald				S3	4 Secure	18	11.7 ± 0.0	NB
I	<i>Somatochlora cingulata</i>	Lake Emerald				S3	4 Secure	10	22.1 ± 1.0	NB
I	<i>Somatochlora forcipata</i>	Forcipate Emerald				S3	4 Secure	16	2.3 ± 0.0	NB
I	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S3	4 Secure	12	13.5 ± 1.0	NB
I	<i>Lestes eurinus</i>	Amber-Winged Spreadwing				S3	4 Secure	8	34.1 ± 0.0	NB
I	<i>Lestes vigilax</i>	Swamp Spreadwing				S3	3 Sensitive	34	2.3 ± 0.0	NB
I	<i>Enallagma geminatum</i>	Skimming Bluet				S3	5 Undetermined	5	16.2 ± 1.0	NB
I	<i>Enallagma signatum</i>	Orange Bluet				S3	4 Secure	6	16.2 ± 1.0	NB
I	<i>Stylurus scudderii</i>	Zebra Clubtail				S3	4 Secure	6	38.6 ± 1.0	NB
I	<i>Leptodea ochracea</i>	Tidewater Mucket				S3	4 Secure	18	83.1 ± 0.0	NB
I	<i>Pantala hymenaea</i>	Spot-Winged Glider				S3B	4 Secure	5	25.2 ± 1.0	NB
I	<i>Satyrium liparops</i>	Striped Hairstreak				S3S4	4 Secure	2	99.6 ± 0.0	NB
I	<i>Cupido comyntas</i>	Eastern Tailed Blue				S3S4	4 Secure	7	64.2 ± 0.0	NB
	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	SH	1 At Risk	1	43.4 ± 1.0	NB
N	<i>Degelia plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Special Concern	S1	2 May Be At Risk	2	44.3 ± 5.0	NB
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S3	5 Undetermined	13	35.9 ± 5.0	NB
N	<i>Anomodon viticulosus</i>	a Moss				S1	2 May Be At Risk	1	96.8 ± 1.0	NB
N	<i>Bryum muehlenbeckii</i>	Muehlenbeck's Bryum Moss				S1	2 May Be At Risk	1	91.5 ± 1.0	NB
N	<i>Calliergon trifarium</i>	Three-ranked Moss				S1	2 May Be At Risk	1	87.1 ± 0.0	NB
N	<i>Dichelyma falcatum</i>	a Moss				S1	2 May Be At Risk	1	83.6 ± 1.0	NB
N	<i>Ditrichum pallidum</i>	Pale Cow-hair Moss				S1	2 May Be At Risk	1	77.7 ± 1.0	NB
N	<i>Fissidens taxifolius</i>	Yew-leaved Pocket Moss				S1	2 May Be At Risk	1	84.2 ± 0.0	NB
N	<i>Meesia triquetra</i>	Three-ranked Cold Moss				S1	2 May Be At Risk	1	82.4 ± 0.0	NB
N	<i>Plagiothecium latebricola</i>	Alder Silk Moss				S1	2 May Be At Risk	1	94.3 ± 0.0	NB
N	<i>Racomitrium ericoides</i>	a Moss				S1	2 May Be At Risk	1	59.5 ± 3.0	NB
N	<i>Rhytidiadelphus loreus</i>	Lanky Moss				S1	2 May Be At Risk	1	79.4 ± 10.0	NB
N	<i>Sphagnum macrophyllum</i>	Sphagnum				S1	2 May Be At Risk	2	72.9 ± 0.0	NB
N	<i>Sphagnum subfulvum</i>	a Peatmoss				S1	2 May Be At Risk	4	19.3 ± 0.0	NB
N	<i>Splachnum pennsylvanicum</i>	Southern Dung Moss				S1	2 May Be At Risk	1	80.2 ± 0.0	NB
N	<i>Tomentypnum falcifolium</i>	Sickle-leaved Golden Moss				S1	2 May Be At Risk	1	71.8 ± 1.0	NB
N	<i>Coscinodon cribrosus</i>	Sieve-Toothed Moss				S1	2 May Be At Risk	1	97.3 ± 0.0	NB
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S1	2 May Be At Risk	1	65.7 ± 10.0	NB
N	<i>Pohlia filum</i>	a Moss				S1?	5 Undetermined	2	79.7 ± 3.0	NB
N	<i>Sphagnum</i>	Flat-leaved Peat Moss				S1?	5 Undetermined	2	20.6 ± 0.0	NB

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N	<i>platyphyllum</i>									
N	<i>Platylomella lescurii</i>	a Moss				S1?	5 Undetermined	1	21.3 ± 1.0	NB
N	<i>Bryum pallescens</i>	Pale Bryum Moss				S1S2	5 Undetermined	2	65.8 ± 1.0	NB
N	<i>Cynodontium strumiferum</i>	Strumose Dogtooth Moss				S1S2	3 Sensitive	1	13.4 ± 8.0	NB
N	<i>Dichelyma capillaceum</i>	Hairlike Dichelyma Moss				S1S2	3 Sensitive	1	67.8 ± 4.0	NB
N	<i>Dicranum spurium</i>	Spurred Broom Moss				S1S2	3 Sensitive	1	21.8 ± 0.0	NB
N	<i>Anomodon tristis</i>	a Moss				S1S2	2 May Be At Risk	1	55.5 ± 1.0	NB
N	<i>Sphagnum angermanicum</i>	a Peatmoss				S1S2	3 Sensitive	2	59.0 ± 1.0	NB
N	<i>Tortula mucronifolia</i>	Mucronate Screw Moss				S1S2	3 Sensitive	1	96.7 ± 0.0	NB
N	<i>Cephaloziella elachista</i>	Spurred Threadwort				S1S3	6 Not Assessed	1	87.1 ± 5.0	NB
N	<i>Porella pinnata</i>	Pinnate Scalewort				S1S3	6 Not Assessed	1	32.1 ± 1.0	NB
N	<i>Reboulia hemisphaerica</i>	Purple-margined Liverwort				S1S3	6 Not Assessed	1	14.9 ± 1.0	NB
N	<i>Amphidium mougeotii</i>	a Moss				S2	3 Sensitive	1	13.4 ± 8.0	NB
N	<i>Buxbaumia aphylla</i>	Brown Shield Moss				S2	3 Sensitive	2	13.4 ± 8.0	NB
N	<i>Campylium polygamum</i>	a Moss				S2	3 Sensitive	1	49.4 ± 1.0	NB
N	<i>Cirriphyllum piliferum</i>	Hair-pointed Moss				S2	3 Sensitive	1	96.3 ± 1.0	NB
N	<i>Cynodontium tenellum</i>	Delicate Dogtooth Moss				S2	3 Sensitive	1	62.5 ± 1.0	NB
N	<i>Hypnum pratense</i>	Meadow Plait Moss				S2	3 Sensitive	1	90.4 ± 0.0	NB
N	<i>Orthotrichum speciosum</i>	Showy Bristle Moss				S2	4 Secure	3	28.5 ± 2.0	NB
N	<i>Racomitrium fasciculare</i>	a Moss				S2	3 Sensitive	1	20.9 ± 0.0	NB
N	<i>Scorpidium scorpioides</i>	Hooked Scorpion Moss				S2	3 Sensitive	2	87.1 ± 0.0	NB
N	<i>Sphagnum centrale</i>	Central Peat Moss				S2	3 Sensitive	1	19.5 ± 0.0	NB
N	<i>Sphagnum lindbergii</i>	Lindberg's Peat Moss				S2	3 Sensitive	3	70.9 ± 1.0	NB
N	<i>Taxiphyllum deplanatum</i>	Imbricate Yew-leaved Moss				S2	3 Sensitive	1	62.5 ± 1.0	NB
N	<i>Tetraplodon mnioides</i>	Entire-leaved Nitrogen Moss				S2	3 Sensitive	3	62.5 ± 1.0	NB
N	<i>Ulota phyllantha</i>	a Moss				S2	3 Sensitive	1	62.5 ± 1.0	NB
N	<i>Zygodon viridissimus</i>	a Moss				S2	2 May Be At Risk	2	19.0 ± 5.0	NB
N	<i>Schistidium agassizii</i>	Elf Bloom Moss				S2	3 Sensitive	2	19.0 ± 5.0	NB
N	<i>Nephroma laevigatum</i>	Mustard Kidney Lichen				S2	2 May Be At Risk	1	65.7 ± 10.0	NB
N	<i>Calliergonella cuspidata</i>	Common Large Wetland Moss				S2S3	3 Sensitive	2	33.6 ± 10.0	NB
N	<i>Didymodon rigidulus</i>	Rigid Screw Moss				S2S3	3 Sensitive	1	74.9 ± 8.0	NB
N	<i>Cephaloziella divaricata</i>	Common Threadwort				S2S4	6 Not Assessed	1	14.9 ± 1.0	NB
N	<i>Aulacomnium androgynum</i>	Little Groove Moss				S3	4 Secure	2	17.9 ± 1.0	NB
N	<i>Dicranella cerviculata</i>	a Moss				S3	3 Sensitive	3	24.4 ± 6.0	NB
N	<i>Dicranum majus</i>	Greater Broom Moss				S3	4 Secure	4	16.7 ± 15.0	NB
N	<i>Heterocladium dimorphum</i>	Dimorphous Tangle Moss				S3	4 Secure	1	28.5 ± 2.0	NB
N	<i>Hypnum curvifolium</i>	Curved-leaved Plait Moss				S3	3 Sensitive	1	19.0 ± 5.0	NB
N	<i>Pleuridium subulatum</i>	a Moss				S3	3 Sensitive	2	97.2 ± 1.0	NB
N	<i>Pogonatum dentatum</i>	Mountain Hair Moss				S3	4 Secure	1	62.5 ± 1.0	NB
N	<i>Sphagnum torreyanum</i>	a Peatmoss				S3	4 Secure	4	19.0 ± 1.0	NB
N	<i>Sphagnum austinii</i>	Austin's Peat Moss				S3	4 Secure	1	84.7 ± 1.0	NB
N	<i>Tetraphis geniculata</i>	Geniculate Four-tooth Moss				S3	4 Secure	4	62.1 ± 0.0	NB
N	<i>Trichostomum tenuirostre</i>	Acid-Soil Moss				S3	4 Secure	2	19.0 ± 5.0	NB
N	<i>Schistidium maritimum</i>	a Moss				S3	4 Secure	1	62.5 ± 1.0	NB
N	<i>Rauvella scita</i>	Smaller Fern Moss				S3	3 Sensitive	1	95.4 ± 3.0	NB
N	<i>Dicranella rufescens</i>	Red Forklet Moss				S3?	5 Undetermined	1	79.4 ± 4.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
N	<i>Sphagnum lescurii</i>	a Peatmoss				S3?	5 Undetermined	1	18.9 ± 1.0	NB
N	<i>Atrichum tenellum</i>	Slender Smoothcap Moss				S3S4	4 Secure	4	24.4 ± 6.0	NB
N	<i>Barbula convoluta</i>	Lesser Bird's-claw Beard Moss				S3S4	4 Secure	1	74.9 ± 8.0	NB
N	<i>Brachythecium campestre</i>	Field Ragged Moss				S3S4	4 Secure	2	79.7 ± 3.0	NB
N	<i>Brachythecium velutinum</i>	Velvet Ragged Moss				S3S4	4 Secure	3	16.7 ± 15.0	NB
N	<i>Dicranella subulata</i>	Awl-leaved Forklet Moss				S3S4	4 Secure	1	78.5 ± 2.0	NB
N	<i>Distichium capillaceum</i>	Erect-fruited Iris Moss				S3S4	4 Secure	1	66.0 ± 0.0	NB
N	<i>Fissidens bryoides</i>	Lesser Pocket Moss				S3S4	4 Secure	1	71.0 ± 4.0	NB
N	<i>Hypnum fauriei</i>	a Moss				S3S4	4 Secure	3	62.5 ± 1.0	NB
N	<i>Isopterygiopsis muelleriana</i>	a Moss				S3S4	4 Secure	6	16.7 ± 15.0	NB
N	<i>Myurella julacea</i>	Small Mouse-tail Moss				S3S4	4 Secure	1	13.4 ± 8.0	NB
N	<i>Pohlia annotina</i>	a Moss				S3S4	4 Secure	2	28.5 ± 2.0	NB
N	<i>Tortula truncata</i>	a Moss				S3S4	4 Secure	1	95.5 ± 1.0	NB
N	<i>Racomitrium microcarpon</i>	a Moss				S3S4	4 Secure	1	19.8 ± 0.0	NB
N	<i>Tetraplodon angustatus</i>	Toothed-leaved Nitrogen Moss				S3S4	4 Secure	1	62.5 ± 1.0	NB
N	<i>Tomentypnum nitens</i>	Golden Fuzzy Fen Moss				S3S4	4 Secure	1	83.3 ± 3.0	NB
N	<i>Limprichtia revolvens</i>	a Moss				S3S4	4 Secure	2	83.7 ± 0.0	NB
N	<i>Grimmia anodon</i>	Toothless Grimmia Moss				SH	5 Undetermined	2	98.4 ± 10.0	NB
N	<i>Leucodon brachypus</i>	a Moss				SH	2 May Be At Risk	2	23.3 ± 3.0	NB
P	<i>Juglans cinerea</i>	Butternut	Endangered	Endangered	Endangered	S1	1 At Risk	52	77.0 ± 1.0	NB
P	<i>Polemonium vanbruntiae</i>	Van Brunt's Jacob's-ladder	Threatened	Threatened	Threatened	S1	1 At Risk	72	42.9 ± 1.0	NB
P	<i>Symphyotrichum anticostense</i>	Anticosti Aster	Threatened	Threatened	Endangered	S1S3	1 At Risk	3	94.2 ± 0.0	NB
P	<i>Symphyotrichum praealtum</i>	Willow-leaved Aster	Threatened	Threatened		SNA	7 Exotic	1	23.5 ± 1.0	NB
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Endangered	S2	1 At Risk	22	68.1 ± 0.0	NB
P	<i>Pterospora andromedea</i>	Woodland Pinedrops			Endangered	S1	1 At Risk	14	91.9 ± 0.0	NB
P	<i>Sanicula trifoliata</i>	Large-Fruited Sanicle				S1	2 May Be At Risk	2	91.2 ± 0.0	NB
P	<i>Antennaria parlinii</i>	a Pussytoes				S1	2 May Be At Risk	2	26.3 ± 0.0	NB
P	<i>Antennaria howellii</i> ssp. <i>petaloidea</i>	Pussy-Toes				S1	2 May Be At Risk	4	70.5 ± 1.0	NB
P	<i>Helianthus decapetalus</i>	Ten-rayed Sunflower				S1	2 May Be At Risk	20	91.0 ± 0.0	NB
P	<i>Hieracium kalmii</i>	Kalm's Hawkweed				S1	2 May Be At Risk	4	61.4 ± 1.0	NB
P	<i>Hieracium kalmii</i> var. <i>kalmii</i>	Kalm's Hawkweed				S1	2 May Be At Risk	6	60.7 ± 1.0	NB
P	<i>Hieracium paniculatum</i>	Panicled Hawkweed				S1	2 May Be At Risk	2	76.6 ± 1.0	NB
P	<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S1	2 May Be At Risk	14	70.6 ± 0.0	NB
P	<i>Solidago simplex</i> var. <i>monticola</i>	Sticky Goldenrod				S1	2 May Be At Risk	1	97.0 ± 0.0	NB
P	<i>Symphyotrichum laeve</i>	Smooth Aster				S1	5 Undetermined	3	86.3 ± 1.0	NB
P	<i>Cardamine parviflora</i> var. <i>arenicola</i>	Small-flowered Bittercress				S1	2 May Be At Risk	9	37.2 ± 0.0	NB
P	<i>Draba arabisans</i>	Rock Whitlow-Grass				S1	2 May Be At Risk	4	43.0 ± 0.0	NB
P	<i>Draba glabella</i>	Rock Whitlow-Grass				S1	2 May Be At Risk	3	71.7 ± 1.0	NB
P	<i>Minuartia groenlandica</i>	Greenland Stitchwort				S1	2 May Be At Risk	1	77.4 ± 0.0	NB
P	<i>Chenopodium capitatum</i>	Strawberry-blite				S1	2 May Be At Risk	2	99.3 ± 6.0	NB
P	<i>Chenopodium simplex</i>	Maple-leaved Goosefoot				S1	2 May Be At Risk	7	73.2 ± 1.0	NB
P	<i>Callitriche terrestris</i>	Terrestrial Water-Starwort				S1	5 Undetermined	1	18.9 ± 0.0	NB

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P	<i>Triadenum virginicum</i>	Virginia St John's-wort				S1	2 May Be At Risk	7	71.2 ± 0.0	NB
P	<i>Viburnum acerifolium</i>	Maple-leaved Viburnum				S1	2 May Be At Risk	10	6.2 ± 0.0	NB
P	<i>Drosera anglica</i>	English Sundew				S1	2 May Be At Risk	1	82.4 ± 0.0	NB
P	<i>Drosera linearis</i>	Slender-Leaved Sundew				S1	2 May Be At Risk	1	82.4 ± 0.0	NB
P	<i>Corema conradii</i>	Broom Crowberry				S1	2 May Be At Risk	1	97.5 ± 10.0	NB
P	<i>Vaccinium boreale</i>	Northern Blueberry				S1	2 May Be At Risk	1	59.9 ± 0.0	NB
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S1	3 Sensitive	9	17.6 ± 5.0	NB
P	<i>Chamaesyce polygonifolia</i>	Seaside Spurge				S1	2 May Be At Risk	8	70.6 ± 0.0	NB
P	<i>Desmodium glutinosum</i>	Large Tick-Trefoil				S1	2 May Be At Risk	1	7.5 ± 1.0	NB
P	<i>Gentiana rubricaulis</i>	Purple-stemmed Gentian				S1	2 May Be At Risk	14	14.1 ± 1.0	NB
P	<i>Lomatogonium rotatum</i>	Marsh Felwort				S1	2 May Be At Risk	2	52.8 ± 0.0	NB
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S1	2 May Be At Risk	1	57.7 ± 0.0	NB
P	<i>Decodon verticillatus</i>	Swamp Loosestrife				S1	2 May Be At Risk	3	82.4 ± 0.0	NB
P	<i>Polygala verticillata</i> <i>var. verticillata</i>	Whorled Milkwort				S1	5 Undetermined	2	93.3 ± 0.0	NB
P	<i>Lysimachia hybrida</i>	Lowland Yellow Loosestrife				S1	2 May Be At Risk	15	3.0 ± 0.0	NB
P	<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife				S1	2 May Be At Risk	7	68.4 ± 1.0	NB
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S1	2 May Be At Risk	4	1.6 ± 1.0	NB
P	<i>Crataegus jonesiae</i>	Jones' Hawthorn				S1	2 May Be At Risk	4	21.4 ± 1.0	NB
P	<i>Waldsteinia fragarioides</i>	Barren Strawberry				S1	2 May Be At Risk	27	85.9 ± 0.0	NB
P	<i>Galium brevipes</i>	Limestone Swamp Bedstraw				S1	2 May Be At Risk	3	44.4 ± 5.0	NB
P	<i>Gratiola aurea</i>	Golden Hedge-Hyssop				S1	3 Sensitive	2	78.5 ± 5.0	NB
P	<i>Pedicularis canadensis</i>	Canada Lousewort				S1	2 May Be At Risk	20	6.2 ± 0.0	NB
P	<i>Viola sagittata</i> <i>var. ovata</i>	Arrow-Leaved Violet				S1	2 May Be At Risk	4	61.1 ± 0.0	NB
P	<i>Alisma subcordatum</i>	Southern Water Plantain				S1	5 Undetermined	5	49.6 ± 0.0	NB
P	<i>Carex cephaloidea</i>	Thin-leaved Sedge				S1	2 May Be At Risk	4	84.9 ± 0.0	NB
P	<i>Carex merritt-fernaldii</i>	Merritt Fernald's Sedge				S1	2 May Be At Risk	2	18.8 ± 0.0	NB
P	<i>Carex saxatilis</i>	Russet Sedge				S1	2 May Be At Risk	2	96.0 ± 10.0	NB
P	<i>Carex sterilis</i>	Sterile Sedge				S1	2 May Be At Risk	1	93.0 ± 0.0	NB
P	<i>Carex grisea</i>	Inflated Narrow-leaved Sedge				S1	2 May Be At Risk	1	98.0 ± 1.0	NB
P	<i>Cyperus diandrus</i>	Low Flatsedge				S1	2 May Be At Risk	5	95.7 ± 0.0	NB
P	<i>Eleocharis olivacea</i>	Yellow Spikerush				S1	2 May Be At Risk	3	4.6 ± 0.0	NB
P	<i>Rhynchospora capillacea</i>	Slender Beakrush				S1	2 May Be At Risk	3	94.6 ± 0.0	NB
P	<i>Sisyrinchium angustifolium</i>	Narrow-leaved Blue-eyed-grass				S1	2 May Be At Risk	3	87.7 ± 0.0	NB
P	<i>Juncus greenei</i>	Greene's Rush				S1	2 May Be At Risk	1	51.1 ± 0.0	NB
P	<i>Allium canadense</i>	Canada Garlic				S1	2 May Be At Risk	10	88.2 ± 5.0	NB
P	<i>Malaxis brachypoda</i>	White Adder's-Mouth				S1	2 May Be At Risk	5	46.9 ± 5.0	NB
P	<i>Platanthera flava</i> <i>var. herbiola</i>	Pale Green Orchid				S1	2 May Be At Risk	13	39.7 ± 0.0	NB
P	<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S1	2 May Be At Risk	2	95.8 ± 0.0	NB
P	<i>Spiranthes casei</i>	Case's Ladies'-Tresses				S1	2 May Be At Risk	6	99.3 ± 0.0	NB
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S1	2 May Be At Risk	9	39.0 ± 5.0	NB
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S1	2 May Be At Risk	17	1.3 ± 0.0	NB
P	<i>Danthonia compressa</i>	Flattened Oat Grass				S1	2 May Be At Risk	2	73.7 ± 0.0	NB
P	<i>Dichanthelium dichotomum</i>	Forked Panic Grass				S1	2 May Be At Risk	18	3.1 ± 0.0	NB
P	<i>Elymus hystrix</i> <i>var. bigeloviana</i>	Spreading Wild Rye				S1	2 May Be At Risk	18	86.4 ± 0.0	NB
P	<i>Glyceria obtusa</i>	Atlantic Manna Grass				S1	2 May Be At Risk	6	3.2 ± 10.0	NB

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P	<i>Sporobolus compositus</i>	Rough Dropseed				S1	2 May Be At Risk	17	92.7 ± 0.0	NB
P	<i>Potamogeton friesii</i>	Fries' Pondweed				S1	2 May Be At Risk	4	87.7 ± 5.0	NB
P	<i>Potamogeton nodosus</i>	Long-leaved Pondweed				S1	2 May Be At Risk	2	99.5 ± 1.0	NB
P	<i>Xyris difformis</i>	Bog Yellow-eyed-grass				S1	5 Undetermined	3	93.5 ± 0.0	NB
P	<i>Botrychium oneidense</i>	Blunt-lobed Moonwort				S1	2 May Be At Risk	3	79.1 ± 0.0	NB
P	<i>Botrychium rugulosum</i>	Rugulose Moonwort				S1	2 May Be At Risk	1	34.9 ± 1.0	NB
P	<i>Schizaea pusilla</i>	Little Curlygrass Fern				S1	2 May Be At Risk	16	74.2 ± 0.0	NB
P	<i>Hieracium kalmii</i> var. <i>fasciculatum</i>	Kalm's Hawkweed				S1?	5 Undetermined	5	23.5 ± 0.0	NB
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S1?	2 May Be At Risk	1	96.8 ± 1.0	NB
P	<i>Drosera rotundifolia</i> var. <i>comosa</i>	Round-leaved Sundew				S1?	5 Undetermined	5	52.8 ± 1.0	NB
P	<i>Wolffia columbiana</i>	Columbian Watermeal				S1?	2 May Be At Risk	1	99.7 ± 0.0	NB
P	<i>Humulus lupulus</i> var. <i>lupuloides</i>	Common Hop				S1S2	3 Sensitive	2	95.6 ± 0.0	NB
P	<i>Rumex aquaticus</i> var. <i>fenestratus</i>	Western Dock				S1S2	2 May Be At Risk	1	92.4 ± 1.0	NB
P	<i>Saxifraga virginensis</i>	Early Saxifrage				S1S2	2 May Be At Risk	14	88.5 ± 0.0	NB
P	<i>Carex rostrata</i>	Narrow-leaved Beaked Sedge				S1S2	3 Sensitive	1	60.8 ± 0.0	NB
P	<i>Potamogeton bicupulatus</i>	Snailseed Pondweed				S1S2	2 May Be At Risk	5	55.2 ± 0.0	NB
P	<i>Selaginella rupestris</i>	Rock Spikemoss				S1S2	2 May Be At Risk	7	92.8 ± 0.0	NB
P	<i>Listera australis</i>	Southern Twayblade			Endangered	S2	1 At Risk	11	67.7 ± 0.0	NB
P	<i>Sanicula odorata</i>	Clustered Sanicle				S2	2 May Be At Risk	4	90.8 ± 0.0	NB
P	<i>Pseudognaphalium macounii</i>	Macoun's Cudweed				S2	3 Sensitive	8	25.3 ± 0.0	NB
P	<i>Solidago altissima</i>	Tall Goldenrod				S2	4 Secure	4	45.6 ± 0.0	NB
P	<i>Solidago simplex</i> var. <i>racemosa</i>	Sticky Goldenrod				S2	2 May Be At Risk	8	90.9 ± 1.0	NB
P	<i>Solidago simplex</i> ssp. <i>randii</i>	Sticky Goldenrod				S2	2 May Be At Risk	2	96.8 ± 0.0	NB
P	<i>Solidago simplex</i>	Sticky Goldenrod				S2	2 May Be At Risk	2	96.5 ± 1.0	NB
P	<i>Symphotrichum racemosum</i>	Small White Aster				S2	3 Sensitive	4	48.9 ± 1.0	NB
P	<i>Alnus serrulata</i>	Smooth Alder				S2	3 Sensitive	49	5.9 ± 0.0	NB
P	<i>Arabis drummondii</i>	Drummond's Rockcress				S2	3 Sensitive	7	92.7 ± 0.0	NB
P	<i>Barbarea orthoceras</i>	American Yellow Rocket				S2	3 Sensitive	2	65.2 ± 10.0	NB
P	<i>Cardamine concatenata</i>	Cut-leaved Toothwort				S2	2 May Be At Risk	1	83.4 ± 1.0	NB
P	<i>Sagina nodosa</i>	Knotted Pearlwort				S2	3 Sensitive	7	42.6 ± 0.0	NB
P	<i>Sagina nodosa</i> ssp. <i>borealis</i>	Knotted Pearlwort				S2	3 Sensitive	1	83.3 ± 0.0	NB
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S2	3 Sensitive	3	96.8 ± 10.0	NB
P	<i>Atriplex franktonii</i>	Frankton's Saltbush				S2	4 Secure	1	23.5 ± 1.0	NB
P	<i>Chenopodium rubrum</i>	Red Pigweed				S2	3 Sensitive	4	93.3 ± 0.0	NB
P	<i>Callitriche hermaphroditica</i>	Northern Water-starwort				S2	4 Secure	2	21.6 ± 0.0	NB
P	<i>Hypericum dissimulatum</i>	Disguised St John's-wort				S2	3 Sensitive	6	45.3 ± 1.0	NB
P	<i>Lonicera oblongifolia</i>	Swamp Fly Honeysuckle				S2	3 Sensitive	38	19.2 ± 0.0	NB
P	<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed				S2	3 Sensitive	14	85.5 ± 1.0	NB
P	<i>Viburnum lentago</i>	Nannyberry				S2	4 Secure	101	3.0 ± 0.0	NB
P	<i>Viburnum recognitum</i>	Northern Arrow-Wood				S2	4 Secure	168	1.5 ± 0.0	NB
P	<i>Astragalus eucosmus</i>	Elegant Milk-vetch				S2	2 May Be At Risk	7	84.8 ± 1.0	NB
P	<i>Oxytropis campestris</i> var. <i>johannensis</i>	Field Locoweed				S2	3 Sensitive	7	84.9 ± 1.0	NB
P	<i>Quercus macrocarpa</i>	Bur Oak				S2	2 May Be At Risk	5	22.0 ± 1.0	NB

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P	<i>Myriophyllum humile</i>	Low Water Milfoil				S2	3 Sensitive	9	43.3 ± 0.0	NB
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2	4 Secure	15	10.6 ± 2.0	NB
P	<i>Nuphar lutea ssp. rubrodiscalis</i>	Red-disked Yellow Pond-lily				S2	3 Sensitive	5	32.7 ± 0.0	NB
P	<i>Orobanche uniflora</i>	One-Flowered Broomrape				S2	3 Sensitive	8	59.1 ± 0.0	NB
P	<i>Polygala paucifolia</i>	Fringed Milkwort				S2	3 Sensitive	11	2.8 ± 0.0	NB
P	<i>Polygala sanguinea</i>	Blood Milkwort				S2	3 Sensitive	10	76.8 ± 0.0	NB
P	<i>Polygala senega</i>	Seneca Snakeroot				S2	3 Sensitive	5	85.6 ± 1.0	NB
P	<i>Polygonum amphibium var. emersum</i>	Water Smartweed				S2	3 Sensitive	5	38.0 ± 0.0	NB
P	<i>Polygonum careyi</i>	Carey's Smartweed				S2	3 Sensitive	5	12.5 ± 1.0	NB
P	<i>Podostemum ceratophyllum</i>	Horn-leaved Riverweed				S2	3 Sensitive	45	4.4 ± 0.0	NB
P	<i>Anemone multifida</i>	Cut-leaved Anemone				S2	3 Sensitive	1	93.4 ± 0.0	NB
P	<i>Hepatica nobilis var. obtusa</i>	Round-lobed Hepatica				S2	3 Sensitive	33	3.1 ± 0.0	NB
P	<i>Ranunculus flabellaris</i>	Yellow Water Buttercup				S2	4 Secure	7	6.7 ± 0.0	NB
P	<i>Ranunculus longirostris</i>	Eastern White Water-Crowfoot				S2	5 Undetermined	4	24.7 ± 1.0	NB
P	<i>Cephalanthus occidentalis</i>	Common Buttonbush				S2	3 Sensitive	47	1.4 ± 0.0	NB
P	<i>Salix candida</i>	Sage Willow				S2	3 Sensitive	2	80.4 ± 1.0	NB
P	<i>Agalinis neoscotica</i>	Nova Scotia Agalinis				S2	3 Sensitive	15	60.1 ± 1.0	NB
P	<i>Euphrasia randii</i>	Rand's Eyebright				S2	2 May Be At Risk	23	37.4 ± 0.0	NB
P	<i>Scrophularia lanceolata</i>	Lance-leaved Figwort				S2	3 Sensitive	3	83.2 ± 0.0	NB
P	<i>Dirca palustris</i>	Eastern Leatherwood				S2	2 May Be At Risk	7	93.0 ± 1.0	NB
P	<i>Phryma leptostachya</i>	American Lopseed				S2	3 Sensitive	7	88.1 ± 0.0	NB
P	<i>Verbena urticifolia</i>	White Vervain				S2	2 May Be At Risk	14	84.9 ± 1.0	NB
P	<i>Viola novae-angliae</i>	New England Violet				S2	3 Sensitive	2	41.5 ± 1.0	NB
P	<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage				S2	3 Sensitive	42	15.1 ± 0.0	NB
P	<i>Carex granularis</i>	Limestone Meadow Sedge				S2	3 Sensitive	6	71.7 ± 0.0	NB
P	<i>Carex gynocrates</i>	Northern Bog Sedge				S2	3 Sensitive	10	25.3 ± 0.0	NB
P	<i>Carex hirtifolia</i>	Pubescent Sedge				S2	3 Sensitive	23	88.1 ± 0.0	NB
P	<i>Carex livida var. radicaulis</i>	Livid Sedge				S2	3 Sensitive	1	97.3 ± 2.0	NB
P	<i>Carex prairea</i>	Prairie Sedge				S2	3 Sensitive	1	87.6 ± 0.0	NB
P	<i>Carex salina</i>	Saltmarsh Sedge				S2	3 Sensitive	2	95.5 ± 1.0	NB
P	<i>Carex sprengelii</i>	Longbeak Sedge				S2	3 Sensitive	12	88.4 ± 0.0	NB
P	<i>Carex tenuiflora</i>	Sparse-Flowered Sedge				S2	2 May Be At Risk	9	39.0 ± 0.0	NB
P	<i>Carex vacillans</i>	Estuarine Sedge				S2	3 Sensitive	4	21.1 ± 1.0	NB
P	<i>Blysmus rufus</i>	Red Bulrush				S2	3 Sensitive	3	67.4 ± 0.0	NB
P	<i>Elodea nuttallii</i>	Nuttall's Waterweed				S2	3 Sensitive	4	6.4 ± 0.0	NB
P	<i>Allium tricoccum</i>	Wild Leek				S2	2 May Be At Risk	6	90.9 ± 0.0	NB
P	<i>Najas gracillima</i>	Thread-Like Naiad				S2	3 Sensitive	8	16.1 ± 0.0	NB
P	<i>Calypso bulbosa var. americana</i>	Calypso				S2	2 May Be At Risk	1	99.5 ± 1.0	NB
P	<i>Coeloglossum viride var. virescens</i>	Long-bracted Frog Orchid				S2	2 May Be At Risk	3	88.4 ± 5.0	NB
P	<i>Cypripedium parviflorum var. makasin</i>	Small Yellow Lady's-Slipper				S2	2 May Be At Risk	6	23.0 ± 1.0	NB
P	<i>Galearis spectabilis</i>	Showy Orchis				S2	2 May Be At Risk	4	90.3 ± 1.0	NB
P	<i>Spiranthes cernua</i>	Nodding Ladies'-Tresses				S2	3 Sensitive	10	16.0 ± 0.0	NB
P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2	3 Sensitive	8	71.1 ± 1.0	NB
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S2	3 Sensitive	8	2.9 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Elymus canadensis</i>	Canada Wild Rye				S2	2 May Be At Risk	14	88.5 ± 1.0	NB
P	<i>Leersia virginica</i>	White Cut Grass				S2	2 May Be At Risk	7	93.3 ± 10.0	NB
P	<i>Piptatherum canadense</i>	Canada Rice Grass				S2	3 Sensitive	5	46.6 ± 0.0	NB
P	<i>Puccinellia phryganodes</i>	Creeping Alkali Grass				S2	3 Sensitive	15	11.8 ± 10.0	NB
P	<i>Schizachyrium scoparium</i>	Little Bluestem				S2	3 Sensitive	12	88.2 ± 0.0	NB
P	<i>Zizania aquatica</i> var. <i>aquatica</i>	Indian Wild Rice				S2	5 Undetermined	1	79.6 ± 0.0	NB
P	<i>Stuckenia filiformis</i> ssp. <i>alpina</i>	Thread-leaved Pondweed				S2	3 Sensitive	3	97.3 ± 0.0	NB
P	<i>Potamogeton richardsonii</i>	Richardson's Pondweed				S2	3 Sensitive	1	97.3 ± 1.0	NB
P	<i>Potamogeton vaseyi</i>	Vasey's Pondweed				S2	3 Sensitive	10	47.0 ± 0.0	NB
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S2	3 Sensitive	7	80.8 ± 0.0	NB
P	<i>Woodwardia virginica</i>	Virginia Chain Fern				S2	3 Sensitive	19	57.6 ± 1.0	NB
P	<i>Selaginella selaginoides</i>	Low Spikemoss				S2	3 Sensitive	4	72.1 ± 0.0	NB
P	<i>Toxicodendron radicans</i>	Poison Ivy				S2?	3 Sensitive	5	18.9 ± 0.0	NB
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2?	3 Sensitive	3	21.2 ± 0.0	NB
P	<i>Symphotrichum novibeltii</i> var. <i>crenifolium</i>	New York Aster				S2?	5 Undetermined	9	37.7 ± 0.0	NB
P	<i>Proserpinaca palustris</i> var. <i>crebra</i>	Marsh Mermaidweed				S2?	3 Sensitive	21	3.4 ± 0.0	NB
P	<i>Epilobium coloratum</i>	Purple-veined Willowherb				S2?	3 Sensitive	9	37.7 ± 1.0	NB
P	<i>Rubus pensilvanicus</i>	Pennsylvania Blackberry				S2?	4 Secure	6	21.3 ± 3.0	NB
P	<i>Rubus recurvicaulis</i>	Arching Dewberry				S2?	4 Secure	1	71.5 ± 1.0	NB
P	<i>Galium obtusum</i>	Blunt-leaved Bedstraw				S2?	4 Secure	2	90.9 ± 1.0	NB
P	<i>Salix myricoides</i>	Bayberry Willow				S2?	3 Sensitive	9	34.0 ± 0.0	NB
P	<i>Platanthera huronensis</i>	Fragrant Green Orchid				S2?	5 Undetermined	2	26.5 ± 0.0	NB
P	<i>Eragrostis pectinacea</i>	Tufted Love Grass				S2?	4 Secure	5	3.5 ± 1.0	NB
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S2S3	3 Sensitive	11	2.3 ± 0.0	NB
P	<i>Elatine americana</i>	American Waterwort				S2S3	3 Sensitive	2	19.9 ± 0.0	NB
P	<i>Bartonia paniculata</i>	Branched Bartonia				S2S3	3 Sensitive	4	74.4 ± 0.0	NB
P	<i>Bartonia paniculata</i> ssp. <i>iodandra</i>	Branched Bartonia				S2S3	3 Sensitive	14	63.5 ± 1.0	NB
P	<i>Geranium robertianum</i>	Herb Robert				S2S3	4 Secure	4	22.3 ± 5.0	NB
P	<i>Myriophyllum quitense</i>	Andean Water Milfoil				S2S3	4 Secure	18	87.9 ± 0.0	NB
P	<i>Rumex pallidus</i>	Seabeach Dock				S2S3	3 Sensitive	4	37.5 ± 0.0	NB
P	<i>Galium labradoricum</i>	Labrador Bedstraw				S2S3	3 Sensitive	24	21.1 ± 0.0	NB
P	<i>Valeriana uliginosa</i>	Swamp Valerian				S2S3	3 Sensitive	14	3.5 ± 1.0	NB
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	4 Secure	2	76.8 ± 10.0	NB
P	<i>Carex plantaginea</i>	Plantain-Leaved Sedge				S2S3	3 Sensitive	3	83.7 ± 0.0	NB
P	<i>Juncus brachycephalus</i>	Small-Head Rush				S2S3	3 Sensitive	1	87.2 ± 0.0	NB
P	<i>Corallorhiza maculata</i> var. <i>occidentalis</i>	Spotted Coralroot				S2S3	3 Sensitive	6	18.9 ± 0.0	NB
P	<i>Corallorhiza maculata</i> var. <i>maculata</i>	Spotted Coralroot				S2S3	3 Sensitive	2	99.5 ± 1.0	NB
P	<i>Listera auriculata</i>	Auricled Twayblade				S2S3	3 Sensitive	9	27.9 ± 0.0	NB
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S2S3	4 Secure	10	19.5 ± 0.0	NB
P	<i>Isoetes acadensis</i>	Acadian Quillwort				S2S3	3 Sensitive	10	17.6 ± 1.0	NB
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	3 Sensitive	6	40.4 ± 1.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Panax trifolius</i>	Dwarf Ginseng				S3	3 Sensitive	1	86.4 ± 0.0	NB
P	<i>Artemisia campestris</i>	Field Wormwood				S3	4 Secure	2	96.5 ± 1.0	NB
P	<i>Artemisia campestris</i> <i>ssp. caudata</i>	Field Wormwood				S3	4 Secure	5	70.8 ± 0.0	NB
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3	4 Secure	3	67.4 ± 0.0	NB
P	<i>Prenanthes racemosa</i>	Glaucous Rattlesnakeroot				S3	4 Secure	15	82.0 ± 0.0	NB
P	<i>Tanacetum bipinnatum</i> <i>ssp. huronense</i>	Lake Huron Tansy				S3	4 Secure	13	84.9 ± 1.0	NB
P	<i>Symphotrichum boreale</i>	Boreal Aster				S3	3 Sensitive	42	15.4 ± 0.0	NB
P	<i>Betula pumila</i>	Bog Birch				S3	4 Secure	33	27.5 ± 0.0	NB
P	<i>Arabis glabra</i>	Tower Mustard				S3	5 Undetermined	3	78.8 ± 1.0	NB
P	<i>Arabis hirsuta</i> var. <i>pycnocarpa</i>	Western Hairy Rockcress				S3	4 Secure	9	93.9 ± 1.0	NB
P	<i>Cardamine maxima</i>	Large Toothwort				S3	4 Secure	12	83.6 ± 0.0	NB
P	<i>Subularia aquatica</i> var. <i>americana</i>	Water Awlwort				S3	4 Secure	18	24.5 ± 0.0	NB
P	<i>Lobelia cardinalis</i>	Cardinal Flower				S3	4 Secure	378	1.5 ± 0.0	NB
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S3	4 Secure	6	23.1 ± 5.0	NB
P	<i>Hudsonia tomentosa</i>	Woolly Beach-heath				S3	4 Secure	3	72.5 ± 0.0	NB
P	<i>Cornus amomum</i> ssp. <i>obliqua</i>	Pale Dogwood				S3	3 Sensitive	188	1.3 ± 0.0	NB
P	<i>Crassula aquatica</i>	Water Pygmyweed				S3	4 Secure	7	70.5 ± 0.0	NB
P	<i>Rhodiola rosea</i>	Roseroot				S3	4 Secure	33	32.4 ± 1.0	NB
P	<i>Penthorum sedoides</i>	Ditch Stonecrop				S3	4 Secure	24	1.6 ± 0.0	NB
P	<i>Elatine minima</i>	Small Waterwort				S3	4 Secure	52	17.7 ± 0.0	NB
P	<i>Astragalus alpinus</i> var. <i>brunetianus</i>	Alpine Milk-Vetch				S3	4 Secure	4	82.9 ± 0.0	NB
P	<i>Gentianella amarella</i> <i>ssp. acuta</i>	Northern Gentian				S3	4 Secure	7	66.3 ± 0.0	NB
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	4 Secure	4	0.3 ± 1.0	NB
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S3	4 Secure	18	40.0 ± 0.0	NB
P	<i>Myriophyllum heterophyllum</i>	Variable-leaved Water Milfoil				S3	4 Secure	1	85.4 ± 0.0	NB
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S3	4 Secure	5	18.7 ± 0.0	NB
P	<i>Myriophyllum sibiricum</i>	Siberian Water Milfoil				S3	4 Secure	4	23.1 ± 1.0	NB
P	<i>Stachys tenuifolia</i>	Smooth Hedge-Nettle				S3	3 Sensitive	8	93.7 ± 0.0	NB
P	<i>Teucrium canadense</i>	Canada Germander				S3	3 Sensitive	2	71.7 ± 1.0	NB
P	<i>Utricularia radiata</i>	Little Floating Bladderwort				S3	4 Secure	52	22.1 ± 0.0	NB
P	<i>Nuphar lutea</i> ssp. <i>pumila</i>	Small Yellow Pond-lily				S3	4 Secure	3	89.0 ± 0.0	NB
P	<i>Epilobium hornemannii</i>	Hornemann's Willowherb				S3	4 Secure	3	66.7 ± 0.0	NB
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	4 Secure	21	19.2 ± 0.0	NB
P	<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb				S3	4 Secure	11	4.7 ± 0.0	NB
P	<i>Polygonum punctatum</i>	Dotted Smartweed				S3	4 Secure	1	62.1 ± 0.0	NB
P	<i>Polygonum punctatum</i> var. <i>confertiflorum</i>	Dotted Smartweed				S3	4 Secure	15	1.8 ± 0.0	NB
P	<i>Polygonum scandens</i>	Climbing False Buckwheat				S3	4 Secure	11	3.1 ± 0.0	NB
P	<i>Littorella uniflora</i>	American Shoreweed				S3	4 Secure	23	24.7 ± 1.0	NB
P	<i>Primula mistassinica</i>	Mistassini Primrose				S3	4 Secure	5	71.8 ± 0.0	NB
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	4 Secure	1	67.5 ± 0.0	NB
P	<i>Clematis occidentalis</i>	Purple Clematis				S3	4 Secure	13	3.2 ± 5.0	NB
P	<i>Ranunculus gmelinii</i>	Gmelin's Water Buttercup				S3	4 Secure	14	82.5 ± 0.0	NB
P	<i>Thalictrum venulosum</i>	Northern Meadow-rue				S3	4 Secure	13	27.8 ± 0.0	NB
P	<i>Agrimonia gryposepala</i>	Hooked Agrimony				S3	4 Secure	29	6.2 ± 0.0	NB
P	<i>Amelanchier</i>	Canada Serviceberry				S3	4 Secure	9	10.9 ± 1.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>canadensis</i>									
P	<i>Rosa palustris</i>	Swamp Rose				S3	4 Secure	39	7.9 ± 1.0	NB
P	<i>Rubus chamaemorus</i>	Cloudberry				S3	4 Secure	52	39.0 ± 1.0	NB
P	<i>Rubus occidentalis</i>	Black Raspberry				S3	4 Secure	18	44.0 ± 0.0	NB
P	<i>Salix interior</i>	Sandbar Willow				S3	4 Secure	16	92.9 ± 1.0	NB
P	<i>Salix nigra</i>	Black Willow				S3	3 Sensitive	6	75.3 ± 0.0	NB
P	<i>Salix pedicellaris</i>	Bog Willow				S3	4 Secure	31	19.3 ± 0.0	NB
P	<i>Geocaulon lividum</i>	Northern Comandra				S3	4 Secure	8	52.9 ± 0.0	NB
P	<i>Parnassia glauca</i>	Fen Grass-of-Parnassus				S3	4 Secure	1	83.7 ± 10.0	NB
P	<i>Limosella australis</i>	Southern Mudwort				S3	4 Secure	10	2.3 ± 5.0	NB
P	<i>Veronica serpyllifolia</i> <i>ssp. humifusa</i>	Thyme-Leaved Speedwell				S3	4 Secure	2	85.4 ± 10.0	NB
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S3	3 Sensitive	135	1.3 ± 0.0	NB
P	<i>Pilea pumila</i>	Dwarf Clearweed				S3	4 Secure	7	79.5 ± 5.0	NB
P	<i>Viola adunca</i>	Hooked Violet				S3	4 Secure	4	32.7 ± 1.0	NB
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S3	4 Secure	8	90.6 ± 0.0	NB
P	<i>Carex arcta</i>	Northern Clustered Sedge				S3	4 Secure	12	23.2 ± 0.0	NB
P	<i>Carex atratiformis</i>	Scabrous Black Sedge				S3	4 Secure	1	97.3 ± 0.0	NB
P	<i>Carex capillaris</i>	Hairlike Sedge				S3	4 Secure	1	97.3 ± 2.0	NB
P	<i>Carex chordorrhiza</i>	Creeping Sedge				S3	4 Secure	10	25.2 ± 0.0	NB
P	<i>Carex conoidea</i>	Field Sedge				S3	4 Secure	12	1.5 ± 0.0	NB
P	<i>Carex exilis</i>	Coastal Sedge				S3	4 Secure	87	56.6 ± 0.0	NB
P	<i>Carex garberi</i>	Garber's Sedge				S3	3 Sensitive	1	70.9 ± 1.0	NB
P	<i>Carex haydenii</i>	Hayden's Sedge				S3	4 Secure	10	27.8 ± 1.0	NB
P	<i>Carex lupulina</i>	Hop Sedge				S3	4 Secure	47	1.3 ± 0.0	NB
P	<i>Carex michauxiana</i>	Michaux's Sedge				S3	4 Secure	49	14.3 ± 1.0	NB
P	<i>Carex ormostachya</i>	Necklace Spike Sedge				S3	4 Secure	6	23.3 ± 0.0	NB
P	<i>Carex rosea</i>	Rosy Sedge				S3	4 Secure	9	86.2 ± 1.0	NB
P	<i>Carex tenera</i>	Tender Sedge				S3	4 Secure	12	6.2 ± 0.0	NB
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S3	4 Secure	21	3.0 ± 0.0	NB
P	<i>Carex vaginata</i>	Sheathed Sedge				S3	3 Sensitive	10	6.4 ± 6.0	NB
P	<i>Carex wiegandii</i>	Wiegand's Sedge				S3	4 Secure	31	34.3 ± 0.0	NB
P	<i>Carex recta</i>	Estuary Sedge				S3	4 Secure	6	21.1 ± 0.0	NB
P	<i>Cyperus dentatus</i>	Toothed Flatsedge				S3	4 Secure	29	1.6 ± 0.0	NB
P	<i>Cyperus esculentus</i>	Perennial Yellow Nutsedge				S3	4 Secure	6	88.4 ± 1.0	NB
P	<i>Eleocharis intermedia</i>	Matted Spikerush				S3	4 Secure	3	18.4 ± 0.0	NB
P	<i>Eleocharis</i> <i>quinqueflora</i>	Few-flowered Spikerush				S3	4 Secure	2	84.7 ± 1.0	NB
P	<i>Eriophorum russeolum</i>	Russet Cottongrass				S3	4 Secure	1	88.4 ± 1.0	NB
P	<i>Rhynchospora</i> <i>capitellata</i>	Small-headed Beakrush				S3	4 Secure	7	72.1 ± 0.0	NB
P	<i>Rhynchospora fusca</i>	Brown Beakrush				S3	4 Secure	35	5.7 ± 0.0	NB
P	<i>Trichophorum clintonii</i>	Clinton's Clubrush				S3	4 Secure	13	24.2 ± 10.0	NB
P	<i>Schoenoplectus</i> <i>fluviatilis</i>	River Bulrush				S3	3 Sensitive	7	86.4 ± 1.0	NB
P	<i>Schoenoplectus torreyi</i>	Torrey's Bulrush				S3	4 Secure	17	18.9 ± 0.0	NB
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3	4 Secure	13	21.1 ± 1.0	NB
P	<i>Triantha glutinosa</i>	Sticky False-Asphodel				S3	4 Secure	6	83.0 ± 5.0	NB
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S3	3 Sensitive	24	19.1 ± 0.0	NB
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3	4 Secure	15	19.4 ± 0.0	NB
P	<i>Platanthera</i> <i>blephariglottis</i>	White Fringed Orchid				S3	4 Secure	15	9.5 ± 1.0	NB
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	3 Sensitive	31	3.3 ± 0.0	NB
P	<i>Bromus latiglumis</i>	Broad-Glumed Brome				S3	3 Sensitive	2	75.3 ± 0.0	NB
P	<i>Calamagrostis</i> <i>pickeringii</i>	Pickering's Reed Grass				S3	4 Secure	103	56.4 ± 0.0	NB
P	<i>Dichanthelium</i>	Starved Panic Grass				S3	4 Secure	2	75.9 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>depauperatum</i>									
P	<i>Muhlenbergia richardsonis</i>	Mat Muhly				S3	4 Secure	9	94.2 ± 0.0	NB
P	<i>Poa glauca</i>	Glaucous Blue Grass				S3	4 Secure	1	97.3 ± 2.0	NB
P	<i>Heteranthera dubia</i>	Water Stargrass				S3	4 Secure	6	90.5 ± 0.0	NB
P	<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed				S3	4 Secure	18	1.3 ± 0.0	NB
P	<i>Xyris montana</i>	Northern Yellow-Eyed-Grass				S3	4 Secure	24	3.1 ± 6.0	NB
P	<i>Zannichellia palustris</i>	Horned Pondweed				S3	4 Secure	3	88.6 ± 0.0	NB
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S3	4 Secure	13	73.8 ± 0.0	NB
P	<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort				S3	4 Secure	7	89.8 ± 1.0	NB
P	<i>Dryopteris fragrans</i> var. <i>remotiuscula</i>	Fragrant Wood Fern				S3	4 Secure	3	87.9 ± 0.0	NB
P	<i>Dryopteris goldiana</i>	Goldie's Woodfern				S3	3 Sensitive	16	73.7 ± 0.0	NB
P	<i>Equisetum palustre</i>	Marsh Horsetail				S3	4 Secure	2	95.9 ± 0.0	NB
P	<i>Isoetes tuckermanii</i>	Tuckerman's Quillwort				S3	4 Secure	17	16.5 ± 0.0	NB
P	<i>Lycopodium sabinifolium</i>	Ground-Fir				S3	4 Secure	5	27.6 ± 1.0	NB
P	<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss				S3	3 Sensitive	1	98.5 ± 1.0	NB
P	<i>Botrychium dissectum</i>	Cut-leaved Moonwort				S3	4 Secure	9	34.2 ± 5.0	NB
P	<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lance-Leaf Grape-Fern				S3	3 Sensitive	11	48.9 ± 0.0	NB
P	<i>Botrychium simplex</i>	Least Moonwort				S3	4 Secure	7	34.4 ± 0.0	NB
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	4 Secure	15	37.5 ± 0.0	NB
P	<i>Utricularia resupinata</i>	Inverted Bladderwort				S3?	4 Secure	14	52.1 ± 0.0	NB
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S3?	3 Sensitive	9	1.1 ± 1.0	NB
P	<i>Lobelia kalmii</i>	Brook Lobelia				S3S4	4 Secure	19	23.5 ± 0.0	NB
P	<i>Suaeda calceoliformis</i>	Horned Sea-blite				S3S4	4 Secure	3	22.8 ± 5.0	NB
P	<i>Utricularia gibba</i>	Humped Bladderwort				S3S4	4 Secure	37	22.1 ± 0.0	NB
P	<i>Rumex maritimus</i>	Sea-Side Dock				S3S4	4 Secure	2	33.3 ± 1.0	NB
P	<i>Potentilla arguta</i>	Tall Cinquefoil				S3S4	4 Secure	33	32.6 ± 1.0	NB
P	<i>Cladium mariscoides</i>	Smooth Twigrush				S3S4	4 Secure	45	5.8 ± 0.0	NB
P	<i>Spirodela polyrrhiza</i>	Great Duckweed				S3S4	4 Secure	8	4.9 ± 0.0	NB
P	<i>Corallorhiza maculata</i>	Spotted Coralroot				S3S4	3 Sensitive	6	38.8 ± 0.0	NB
P	<i>Potamogeton oakesianus</i>	Oakes' Pondweed				S3S4	4 Secure	35	7.1 ± 0.0	NB
P	<i>Stuckenia pectinata</i>	Sago Pondweed				S3S4	4 Secure	37	20.5 ± 0.0	NB
P	<i>Montia fontana</i>	Water Blinks				SH	2 May Be At Risk	1	52.4 ± 1.0	NB
P	<i>Solidago caesia</i>	Blue-stemmed Goldenrod				SX	0.1 Extirpated	2	99.6 ± 1.0	NB
P	<i>Celastrus scandens</i>	Climbing Bittersweet				SX	0.1 Extirpated	3	84.4 ± 100.0	NB
P	<i>Carex swanii</i>	Swan's Sedge				SX	0.1 Extirpated	2	72.6 ± 1.0	NB

5.1 SOURCE BIBLIOGRAPHY (100 km)

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

# recs	CITATION
9480	eBird. 2014. eBird Basic Dataset. Version: EBD_relNov-2014. Ithaca, New York. Nov 2014. Cornell Lab of Ornithology, 25036 recs.
2516	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
1583	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
1123	Morrison, Guy. 2011. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Ottawa, 15939 surveys. 86171 recs.
1010	Blaney, C.S. & Mazerolle, D.M. 2011. NB WTF Fieldwork on Magaguadavic & Lower St Croix Rivers. Atlantic Canada Conservation Data Centre, 4585 recs.

# recs	CITATION
484	Benedict, B. Connell Herbarium Specimens. University New Brunswick, Fredericton. 2003.
355	Pardieck, K.L. & Ziolkowski Jr., D.J.; Hudson, M.-A.R. 2014. North American Breeding Bird Survey Dataset 1966 - 2013, version 2013.0. U.S. Geological Survey, Patuxent Wildlife Research Center <www.pwrc.usgs.gov/BBS/RawData/>.
326	Hicks, Andrew. 2009. Coastal Waterfowl Surveys Database, 2000-08. Canadian Wildlife Service, Sackville, 46488 recs (11149 non-zero).
322	Blaney, C.S.; Mazerolle, D.M.; Klymko, J.; Spicer, C.D. 2006. Fieldwork 2006. Atlantic Canada Conservation Data Centre. Sackville NB, 8399 recs.
307	Clayden, S.R. 1998. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 19759 recs.
292	Sollows, M.C., 2008. NBM Science Collections databases: mammals. New Brunswick Museum, Saint John NB, download Jan. 2008, 4983 recs.
268	Tims, J. & Craig, N. 1995. Environmentally Significant Areas in New Brunswick (NBESA). NB Dept of Environment & Nature Trust of New Brunswick Inc, 6042 recs.
252	Benedict, B. Connell Herbarium Specimens (Data) . University New Brunswick, Fredericton. 2003.
231	Goltz, J.P. 2012. Field Notes, 1989-2005. , 1091 recs.
210	Blaney, C.S. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 1042 recs.
194	Brunelle, P.-M. (compiler). 2009. ADIP/MDDS Odonata Database: data to 2006 inclusive. Atlantic Dragonfly Inventory Program (ADIP), 24200 recs.
194	Hinds, H.R. 1986. Notes on New Brunswick plant collections. Connell Memorial Herbarium, unpubl, 739 recs.
184	Blaney, C.S. & Mazerolle, D.M. 2011. Field data from NCC properties at Musquash Harbour NB & Goose Lake NS. Atlantic Canada Conservation Data Centre, 1739 recs.
184	Blaney, C.S.; Mazerolle, D.M. 2009. Fieldwork 2009. Atlantic Canada Conservation Data Centre. Sackville NB, 13395 recs.
149	Boyne, A.W. 2000. Tern Surveys. Canadian Wildlife Service, Sackville, unpublished data. 168 recs.
141	Blaney, C.S.; Mazerolle, D.M. 2012. Fieldwork 2012. Atlantic Canada Conservation Data Centre, 13,278 recs.
137	Bateman, M.C. 2001. Coastal Waterfowl Surveys Database, 1965-2001. Canadian Wildlife Service, Sackville, 667 recs.
118	Wilhelm, S.I. et al. 2011. Colonial Waterbird Database. Canadian Wildlife Service, Sackville, 2698 sites, 9718 recs (8192 obs).
115	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2014. Atlantic Canada Conservation Data Centre Fieldwork 2014. Atlantic Canada Conservation Data Centre, # recs.
103	Blaney, C.S. 2000. Fieldwork 2000. Atlantic Canada Conservation Data Centre. Sackville NB, 1265 recs.
103	Sollows, M.C. 2008. NBM Science Collections databases: herpetiles. New Brunswick Museum, Saint John NB, download Jan. 2008, 8636 recs.
97	Clayden, S.R. 2007. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, download Mar. 2007, 6914 recs.
91	Benedict, B. Connell Herbarium Specimen Database Download 2004. Connell Memorial Herbarium, University of New Brunswick. 2004.
76	Belland, R.J. Maritimes moss records from various herbarium databases. 2014.
74	Blaney, C.S.; Spicer, C.D.; Mazerolle, D.M. 2005. Fieldwork 2005. Atlantic Canada Conservation Data Centre. Sackville NB, 2333 recs.
69	Cowie, Faye. 2007. Surveyed Lakes in New Brunswick. Canadian Rivers Institute, 781 recs.
62	Blaney, C.S.; Spicer, C.D. 2001. Fieldwork 2001. Atlantic Canada Conservation Data Centre. Sackville NB, 981 recs.
60	Erskine, A.J. 1999. Maritime Nest Records Scheme (MNRS) 1937-1999. Canadian Wildlife Service, Sackville, 313 recs.
48	Bagnell, B.A. 2001. New Brunswick Bryophyte Occurrences. B&B Botanical, Sussex, 478 recs.
45	Blaney, C.S.; Spicer, C.D.; Popma, T.M.; Hanel, C. 2002. Fieldwork 2002. Atlantic Canada Conservation Data Centre. Sackville NB, 2252 recs.
44	Blaney, C.S.; Spicer, C.D.; Rothfels, C. 2004. Fieldwork 2004. Atlantic Canada Conservation Data Centre. Sackville NB, 1343 recs.
41	Stewart, J.I. 2010. Peregrine Falcon Surveys in New Brunswick, 2002-09. Canadian Wildlife Service, Sackville, 58 recs.
40	McAlpine, D.F. 1998. NBM Science Collections databases to 1998. New Brunswick Museum, Saint John NB, 241 recs.
38	Klymko, J.J.D. 2014. Maritimes Butterfly Atlas, 2012 submissions. Atlantic Canada Conservation Data Centre, 8552 records.
36	Scott, Fred W. 1998. Updated Status Report on the Cougar (Puma Concolor cougar) [Eastern population]. Committee on the Status of Endangered Wildlife in Canada, 298 recs.
34	Speers, L. 2008. Butterflies of Canada database: New Brunswick 1897-1999. Agriculture & Agri-Food Canada, Biological Resources Program, Ottawa, 2048 recs.
28	Robinson, S.L. 2015. 2014 field data.
27	McAlpine, D.F. 1998. NBM Science Collections: Wood Turtle records. New Brunswick Museum, Saint John NB, 329 recs.
25	Sollows, M.C., 2009. NBM Science Collections databases: molluscs. New Brunswick Museum, Saint John NB, download Jan. 2009, 6951 recs (2957 in Atlantic Canada).
24	Clayden, S.R. 2012. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 57 recs.
24	Sabine, D.L. 2005. 2001 Freshwater Mussel Surveys. New Brunswick Dept of Natural Resources & Energy, 590 recs.
23	Tingley, S. (compiler). 2001. Butterflies of New Brunswick. , Web site: www.geocities.com/Yosemite/8425/buttrfly. 142 recs.
21	Kennedy, Joseph. 2010. New Brunswick Peregrine records, 2009. New Brunswick Dept Natural Resources, 19 recs (14 active).
20	Cronin, P. & Ayer, C.; Dube, B.; Hooper, W.C.; LeBlanc, E.; Madden, A.; Pettigrew, T.; Seymour, P. 1998. Fish Species Management Plans (draft). NB DNRE Internal Report. Fredericton, 164pp.
20	Pike, E., Tingley, S. & Christie, D.S. 2000. Nature NB Listserve. University of New Brunswick, listserv.unb.ca/archives/naturenb. 68 recs.
18	Hinds, H.R. 1999. Connell Herbarium Database. University New Brunswick, Fredericton, 131 recs.
16	Klymko, J.J.D. 2012. Maritimes Butterfly Atlas, 2010 and 2011 records. Atlantic Canada Conservation Data Centre, 6318 recs.
15	Bateman, M.C. 2000. Waterfowl Brood Surveys Database, 1990-2000 . Canadian Wildlife Service, Sackville, unpublished data. 149 recs.
15	Houston, J.J. 1990. Status of the Redbreast Sunfish (Lepomis auritus) in Canada. Can. Field-Nat., 104:64-68. 15 recs.
14	Benedict, B. Connell Herbarium Specimens, Digital photos. University New Brunswick, Fredericton. 2005.
14	Doucet, D.A. & Edsall, J.; Brunelle, P.-M. 2007. Miramichi Watershed Rare Odonata Survey. New Brunswick ETF & WTF Report, 1211 recs.
14	Edsall, J. 2001. Lepidopteran records in New Brunswick, 1997-99. , Pers. comm. to K.A. Bredin. 91 recs.
14	Spicer, C.D. 2001. Powerline Corridor Botanical Surveys, Charlotte & Saint John Counties. A M E C International, 1269 recs.
12	Blaney, C.S.; Mazerolle, D.M. 2010. Fieldwork 2010. Atlantic Canada Conservation Data Centre. Sackville NB, 15508 recs.
11	Benedict, B. Connell Herbarium Specimens. University New Brunswick, Fredericton. 2000.
10	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.

# recs	CITATION
10	Noseworthy, J. 2013. Van Brunt's Jacob's-ladder observations along tributary of Dipper Harbour Ck. Nature Conservancy of Canada, 10 recs.
8	Doucet, D.A. 2008. Fieldwork 2008: Odonata. ACCDC Staff, 625 recs.
8	Edsall, J. 2007. Personal Butterfly Collection: specimens collected in the Canadian Maritimes, 1961-2007. J. Edsall, unpubl. report, 137 recs.
8	Mills, E. Connell Herbarium Specimens, 1957-2009. University New Brunswick, Fredericton. 2012.
7	Christie, D.S. 2000. Christmas Bird Count Data, 1997-2000. Nature NB, 54 recs.
7	Doucet, D.A. 2007. Lepidopteran Records, 1988-2006. Doucet, 700 recs.
7	Goltz, J.P. & Bishop, G. 2005. Confidential supplement to Status Report on Prototype Quillwort (<i>Isoetes prototypus</i>). Committee on the Status of Endangered Wildlife in Canada, 111 recs.
7	Goltz, J.P. 1994. In the Footsteps of Our Ancestors. NB Naturalists, 21 (2-4): 20. 8 recs.
7	Kennedy, Joseph. 2010. New Brunswick Peregrine records, 2010. New Brunswick Dept Natural Resources, 16 recs (11 active).
7	Klymko, J.J.D. 2012. Insect fieldwork & submissions, 2003-11. Atlantic Canada Conservation Data Centre. Sackville NB, 1337 recs.
7	Speers, L. 2001. Butterflies of Canada database. Agriculture & Agri-Food Canada, Biological Resources Program, Ottawa, 190 recs.
6	Brunelle, P.-M. (compiler). 2010. ADIP/MDDS Odonata Database: NB, NS Update 1900-09. Atlantic Dragonfly Inventory Program (ADIP), 935 recs.
6	McAlpine, D.F. 1983. Status & Conservation of Solution Caves in New Brunswick. New Brunswick Museum, Publications in Natural Science, no. 1, 28pp.
6	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2013.
6	Popma, T.M. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 113 recs.
5	Boyne, A.W. 2000. Harlequin Duck Surveys. Canadian Wildlife Service, Sackville, unpublished data. 5 recs.
5	Whittam, R.M. 1999. Status Report on the Roseate Tern (update) in Canada. Committee on the Status of Endangered Wildlife in Canada, 36 recs.
4	Bredin, K.A. 2003. NB Freshwater Mussel Fieldwork. Atlantic Canada Conservation Data Centre, 20 recs.
4	Clayden, S.R. 2003. NS lichen ranks, locations. Pers. comm to C.S. Blaney. 1p, 5 recs, 5 recs.
4	Klymko, J.J.D. 2012. Odonata specimens & observations, 2010. Atlantic Canada Conservation Data Centre, 425 recs.
4	Sabine, D.L. 2011. Dorcas Copper records from 2001 Fieldwork. New Brunswick Dept of Natural Resources, 4 recs.
3	Bishop, G., Bagnell, B.A. 2004. Site Assessment of Musquash Harbour, Nature Conservancy of Canada Property - Preliminary Botanical Survey. B&B Botanical, 12pp.
3	Blaney, C.S.; Mazerolle, D.M. 2011. Fieldwork 2011. Atlantic Canada Conservation Data Centre. Sackville NB.
3	Clayden, S.R. 2006. <i>Pseudevernia cladonia</i> records. NB Museum. Pers. comm. to S. Blaney, Dec, 4 recs.
3	Layberry, R.A. 2012. Lepidopteran records for the Maritimes, 1974-2008. Layberry Collection, 1060 recs.
3	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.
2	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville, 3344 recs, 1228 new.
2	Bishop, G. 2012. Field data from September 2012 Anticosti Aster collection trip. , 135 rec.
2	Chaput, G. 2002. Atlantic Salmon: Maritime Provinces Overview for 2001. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-14. 39 recs.
2	Cowie, F. 2007. Electrofishing Population Estimates 1979-98. Canadian Rivers Institute, 2698 recs.
2	Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
2	Goltz, J.P. 2002. Botany Rambblings: 1 July to 30 September, 2002. N.B. Naturalist, 29 (3):84-92. 7 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	Hinds, H.R. 1999. A Vascular Plant Survey of the Musquash Estuary in New Brunswick. , 12pp.
2	Klymko, J.J.D. 2012. Insect field work & submissions. Atlantic Canada Conservation Data Centre, 852 recs.
2	MacDougall, A.; Bishop, G.; et al. 1998. 1997 Appalachian Hardwood Field Data. Nature Trust of New Brunswick, 4473 recs.
2	Marx, M. & Kenney, R.D. 2001. North Atlantic Right Whale Database. University of Rhode Island, 4 recs.
2	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.
2	Sollows, M.C.. 2009. NBM Science Collections databases: Coccinellid & Cerambycid Beetles. New Brunswick Museum, Saint John NB, download Feb. 2009, 569 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	Amirault, D.L. 1997-2000. Unpublished files. Canadian Wildlife Service, Sackville, 470 recs.
1	Benedict, B. 2006. Argus annotation: <i>Salix pedicellaris</i> . Pers. comm to C.S. Blaney, June 21, 1 rec.
1	Benedict, B. <i>Agalinis neoscotica</i> specimen from Grand Manan. 2009.
1	Brunelle, P.-M. 2005. Wood Turtle observations. Pers. comm. to S.H. Gerriets, 21 Sep. 3 recs, 3 recs.
1	Brunton, D. F. & McIntosh, K. L. <i>Agalinis neoscotica</i> herbarium record from D. F. Brunton Herbarium. D.F. Brunton Herbarium, Ottawa. 2005.
1	Clayden, S.R. 2007. NBM Science Collections. Pers. comm. to D. Mazerolle, 1 rec.
1	Dadswell, M.J. 1979. Status Report on Shortnose Sturgeon (<i>Acipenser brevirostrum</i>) in Canada. Committee on the Status of Endangered Wildlife in Canada, 15 pp.
1	Dept of Fisheries & Oceans. 1999. Status of Wild Striped Bass, & Interaction between Wild & Cultured Striped Bass in the Maritime Provinces. , Science Stock Status Report D3-22. 13 recs.
1	Edsall, J. 1992. Summer 1992 Report. New Brunswick Bird Info Line, 2 recs.
1	Goltz, J.P. 2001. Botany Rambblings April 29-June 30, 2001. N.B. Naturalist, 28 (2): 51-2. 8 recs.
1	Hicklin, P.W. 1990. Shorebird Concentration Sites (unpubl. data). Canadian Wildlife Service, Sackville, 296 sites, 30 spp.
1	Hicklin, P.W. 1999. The Maritime Shorebird Survey Newsletter. Calidris, No. 7. 6 recs.
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. <i>Acipenser oxyrinchus</i> 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	Litvak, M.K. 2001. Shortnose Sturgeon records in four NB rivers. UNB Saint John NB. Pers. comm. to K. Bredin, 6 recs.
1	Maass, W.S.G. & Yetman, D. 2002. Assessment and status report on the boreal felt lichen (<i>Erioderma pedicellatum</i>) in Canada. Committee on the Status of Endangered Wildlife in Canada, 1 rec.

# recs	CITATION
1	McAlpine, D.F. & Cox, S.L., McCabe, D.A., Schnare, J.-L. 2004. Occurrence of the Long-tailed Shrew (<i>Sorex dispar</i>) in the Nerepis Hills NB. <i>Northeastern Naturalist</i> , vol 11 (4) 383-386. 1 rec.
1	McAlpine, D.F. 2001. <i>Lepomis auritus</i> , 2 sites in Saint John County. New Brunswick Museum, Pers. comm. to K.A. Bredin. 2 recs.
1	Sabine, D.L. & Goltz, J.P. 2006. Discovery of <i>Utricularia resupinata</i> at Little Otter Lake, CFB Gagetown. Pers. comm. to D.M. Mazerolle, 1 rec.
1	Sabine, D.L. 2012. Bronze Copper records, 2003-06. New Brunswick Dept of Natural Resources, 5 recs.
1	Sabine, D.L. 2013. Dwaine Sabine butterfly records, 2009 and earlier.
1	Taylor, Eric B. 1997. Status of the Sympatric Smelt (genus <i>Osmerus</i>) Populations of Lake Utopia, New Brunswick. Committee on the Status of Endangered Wildlife in Canada, 1 rec.
1	Toner, M. 2001. Lynx Records 1973-2000. NB Dept of Natural Resources, 29 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.
1	Webster, R.P. & Edsall, J. 2007. 2005 New Brunswick Rare Butterfly Survey. Environmental Trust Fund, unpublished report, 232 recs.

DATA DICTIONARY:

revised May 4, 2012

I. Observation Records

The following fields of data may be included (and may or may not be populated) in occurrence records. Text field lengths given as TXT+ are 255 char max. (and may truncate text).

TAXONOMY	type	definition
MCODE	TXT 8	8 character 'Museum Code' (1 to 4 = genus, 5 to 8 = sp+ssp)
ELCODE	TXT 10-12	Unique Identifier of taxon ¹
SCINAME	TXT+	Global Scientific Name of taxon ¹
COMNAME	TXT+	English Common Name of taxon ¹
NOMCOMMUN	TXT+	French Common Name

LOCATION

SURVEYSITE	TXT+	General locality of occurrence (not necessarily protected)
DIRECTIONS	TXT+	Specific locality: e.g. bearings and distance from enduring landmark
SUBNAT	TXT 2	Province/State: 2 character ISO code
COCODE	TXT 6	County Code (2 chars for province + 4 chars for county name)
MAPCODE	TXT 7	Map number: NTS identifier in Canada
UTME20	NUM 6	UTM ³ Easting reprojected as Zone 20
UTMN20	NUM 7	UTM ³ Northing reprojected as Zone 20
LONDEC	DEC 12,6	Decimal Longitude (6 decimal places, negative for west of Greenwich)
LATDEC	DEC 12,6	Decimal Latitude (6 decimal places)
LOCUNCM	NUM 5	Precision in meters, i.e. geospatial resolution or lack thereof
PREC	DEC 3,1	Precision in meters by power of 10 (e.g. 3 = 10 to the 3rd = 1000m = 1km)

	<i>prec</i>	<i>common speech</i>	<i>example</i>	<i>unit size</i>	<i>literal range (m)</i>
6.0		within province	province	1000.0km	562.3 - 1778.3
5.7		in part of province	'NW NB'	500.0km	281.2 - 889.1
5.0		within in county	county	100.0km	56.2 - 177.8
4.7		within 50s of kilometers		50.0km	28.1 - 88.9
4.0		within 10s of kilometers	BBA grid	10.0km	5.6 - 17.8
3.7		within 5s of kilometers		5.0km	2.8 - 8.9
3.0		within kilometers	topo grid	1.0km	0.6 - 1.8
2.7		within 500s of meters		500.0m	281.2 - 889.1
2.0		within 100s of meters	ball field	100.0m	56.2 - 177.8
1.7		within 50s of meters		50.0m	28.1 - 88.9
1.0		within 10s of meters	boxcar	10.0m	5.6 - 17.8
0.7		within 5s of meters		5.0m	2.8 - 8.9
0.0		within meters NOT USED	pace	1.0m	0.6 - 1.8
-1.0		within 10s of centimeters	fingernail	0.1m	0.1 - 0.2

RARITY STATUS

NRANK	TXT 5	National Rarity Rank of taxon (in Canada) ¹
NPROT	TXT+	National Protection Status of taxon (= COSEWIC in Canada)

code rank and short definition

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

SRANK**	TXT 5	Subnational (Provincial) Rarity Rank of taxon ¹
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code rank and short definition

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

SPROT**	TXT+	Provincial rank/status of taxon; cf provincial websites
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DATASENS TXT 5 Data sensitivity index; indicates blurred² export coordinates
 IUCN TXT+ International Union of Conservation Naturalists rarity rank; cf IUCN website
code rank and short definition

EX	Extinct: no individuals remaining
EW	Extinct in the Wild: only captive or naturalised survivors
CR	Critically Endangered: extreme risk of extinction in wild
EN	Endangered: high risk of extinction in wild
VU	Vulnerable: high risk of endangerment in wild
NT	Near Threatened: likely to become endangered soon
LC	Least Concern: lowest risk, widespread and abundant
DD	Data Deficient: data inadequate for assessment
NE	Not Evaluated, not yet assessed against criteria

OBSERVATION

OBSERVER TXT+ Person or persons collecting specimen, in bibliographic form
 OBDATE TXT 10 Date of specimen collection as YYYY MM DD
OBDATA TXT+ Concatenation of fields below, relating to specimen (EODATAEVID, EODATACNT etc)
 OBEVID TXT+ Type of evidence (specimen, photo etc)
 OBCOUNT TXT+ Number of individuals at location
 OBABUN TXT+ Relative rarity of taxon at location, e.g. ‘common’, ‘scattered’
 OBSIZE TXT+ Size of specimen
 SIZE TXT+ Size of occurrence ‘patch’ (in m2, ha or acres)
 OBDESC TXT+ Details of specimen appearance
 OBPHEN TXT+ Lifestage of specimen (bud, flowering etc)
 OBSEX TXT+ Male/female if relevant
 OBACTIV TXT+ Activity of taxon when observed (nesting, crossing road etc)
 OBASSP TXT+ Other taxa associated with specimen
 NOTETAX TXT+ Identifier’s note on taxonomic issues
GENDESC TXT+ Concatenation of fields below, relating to site (HABITAT, ECOL etc)
 HABITAT TXT+ Habitat characterisation of location
 ECODIST NUM 4 National Ecological Framework EcoDistrict identifier
 WSCODE TXT 10 Quaternary Watershed identifier
GCOM TXT+ General Comments: concatenation of Notes (NOTE1, NOTE2, NOTE3)

COLLECTION

OWNER TXT+ Landowner or owner type (Federal, Provincial, Private, etc)
 ACCNUM TXT+ Museum/Herbarium Accession number
 COLLNUM TXT+ Collectors’ number
 COLLECTION TXT+ Herbarium acronym(s) with specimen
 CITATION TXT+ Primary source of data

DATA MANAGEMENT

IDNUM TXT+ Field Office Number: Internal ACCDC record reference (not the EONUM)
 EDITION TXT 14 Last editor’s initials and date as YYYY MM DD
 OB TXT 2 Mapping shape: PN=polygon, BF=buffer, LN=line, PT=point
 DB TXT 2 Database, e.g. Ob=observations, Ff=freshwater fish, Bp=birds, pelagic
 IN TXT 2 GIS search flag for observation within buffer
 IX TXT 2 GIS search flag for observation intersects buffer
 EONUMLAST NUM 3 Map labeling flag for most recent taxon observation in area
 RARENS NUM 1 Inclusion flag for extraprovincial records in NS 100km GIS scans

Notes:

¹ Methodology of NatureServe, Arlington, VA
² Easting and Northing rounded to 5, 10 or 50km grid location.
³ Universal Transverse Mercator.
 ** Field name followed by 2-character ISO provincial abbreviation.

II. Managed or Special Areas

The following fields of data may be included (and may or may not be populated) for Protected Areas and Ecologically Significant Areas.

IDENTITY

MACODE	TXT 14	Unique identifier for Managed Area ¹ with some level of protection
SACODE	TXT 14	Unique identifier for Ecologically Special Area ¹ with or without protection
MANAME	TXT+	Name of Protected Area containing occurrence
SANAME	TXT+	Name of Ecologically Special Area containing occurrence
SITECODE	TXT+	External agency site identity code

JURISDICTION / OWNERSHIP

LOCALJURIS	TXT+	Abbreviation for mandated agency
OWNER	TXT+	Short name or category of title holder
OWNERCOM	TXT+	Short detail of multiparty arrangements
OWNERCODE	TXT+	Canadian Conservation Area DB ownercodes (modified)

<i>group</i>	<i>code</i>	<i>designation</i>
Owner	GN	government, national (federal)
	GS	government, subnational (prov., state)
	GM	government, municipal
	IN	international
	NG	non-governmental organisation
	OR	organisational
	CO	corporate
	PR	private

CLASSIFICATION

PROTSTAT	TXT+	Activities permitted or restricted (when known)
LEGALACT	TXT+	Short title of enabling legislation
LEGALDATE	TXT+	Year of enabling legislation
ESTABDATE	TXT+	Year of site designation
IBP	TXT+	International Biological Program identity number (Y=unknown)
IBPSTATUS	TXT+	International Biological Program status: proposed or declared
IUCN	TXT+	IUCN protection level, e.g. I very restricted, VI few restrictions
LEVEL1	TXT 3	Canadian Conservation Area DB type
LEVEL2	TXT+	Canadian Conservation Area DB subtype(s)

<i>group</i>	<i>code</i>	<i>designation</i>
Conservation	CEP	Conservation Easement Property
	ESA	Environmentally Sensitive Area
	NAC	Nature Conservancy
	NAT	Natural Area
	NCA	NCC Conservation Land
	PCA	Private Conservation Area
	PRA	Protected Area
	PRB	Protected Beach
	RER	Representative Area Ecological Reserve
	TRA	Nature Trail
Heritage	ARS	Archaeological Site
	HEA	Heritage Area or Park
	HEC	Heritage Canal
	HEP	Heritage Park
	HER	Heritage River
	HIA	Historic Area or Park
	NHP	National Historic Park
	NHS	National Historic Site
	PEP	Provincial Heritage Property
	PHP	Provincial Historic/Heritage Park
Parks	PHS	Provincial Heritage Site
	WHS	World Heritage Site
	CMG	Campground
	CMP	Community Park
	DUP	Day Use Park
	MUP	Municipal Park
	NAP	National Park
	NEP	Natural Environment Park
	NTP	Nature Park
	PKW	Parkway
PNS	Picnic Site	
PVP	Provincial Park	
WAP	Wayside Park	

<i>group</i>	<i>code</i>	<i>designation</i>
Wilderness	ECR	Ecological Reserve
	NTA	Nature Trust Area
	NTR	Nature Reserve
	SES	Significant Ecological Area
	WDA	Wilderness Area
	WDR	Wilderness Reserve
Wildlife	BSR	Bird Sanctuary
	EHJ	Eastern Habitat Joint Venture
	GAS	Game Sanctuary
	MBS	Migratory Bird Sanctuary
	NWA	National Wildlife Area
	PWA	Provincial Wildlife Area
	SBS	Sea Bird Sanctuary
	WHR	Western Hemispheric Shorebird Reserve
	WLP	Wildlife Park
	WLR	Wildlife Reserve
	WLS	Wildlife Sanctuary
	WMA	Wildlife Management Area
	WPA	Wildlife Protection Area
	WRF	Wildlife Refuge
Other	AGF	Agreement Forest
	ASI	Area of Scientific Interest
	DUN	Ducks Unlimited Canada
	EDA	Education Area
	FCP	Federal Community Pasture
	IBP	International Biological Program
	NCC	National Capital Commission
	NSA	Natural Scenic Area
	PLS	Palaeontological Site
	PSL	Public Safety Lands: watershed protection
	RAM	Ramsar Wetland Site
	RTA	Research and Teaching Area
NS SigHab	380	wetland habitat
	381	saltmarsh habitat
	382	deer/moose wintering
	383	other significant habitats

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