



Biophysical Assessment:
Granite Village Quarry Expansion
Granite Village,
Queens County, Nova Scotia –
PID 70228531

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Prepared for:

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1 INTRODUCTION

Dexter Construction Company Limited, Bedford, Nova Scotia (Dexter), is proposing to expand its 4.0 ha quarry in the Granite Village area—between Port Mouton and Sable River on the south shore of Nova Scotia in Queens and Shelburne Counties respectively. The quarry is presently operating under an industrial approval for a quarry less than four hectares (ha) in size. An approval to expand the quarry beyond the current size is required under the Environmental Assessment Regulations of the Nova Scotia *Environment Act*. Dexter contracted EnviroSphere Consultants Limited of Windsor, Nova Scotia, to prepare a biophysical and socio-economic overview and assessment of the proposed quarry expansion in support of the Environmental Assessment application. This report contains the results of the overview and assessment. It presents a description of the methodology and scope, existing environment, environmental effects, cumulative effects, discussion, and conclusions. The assessment provides a sufficient level of detail to ensure that all information necessary to allow adequate review of the project is provided; to demonstrate how the assessment was conducted; and to document the information on which the conclusions were based.

2 INFORMATION SOURCES

Information for the biophysical and socio-economic overview and assessment was collected from various sources, including interviews with representatives of the Nova Scotia Department of Natural Resources and Renewables (NSNRR); contacts with organizations, businesses and individuals in the area; review of published information including soil surveys, reports on geology, archaeology, and natural history (e.g. *Natural History of Nova Scotia*); use of relevant websites and databases (e.g. Nova Scotia Open Data Portal; NSNRR Significant Habitat and Wetland Databases, Atlantic Canada Conservation Data Centre, and Nova Scotia Museum of Natural History); and use of maps, digital data on land use, and property ownership, aerial photos, and 1:50,000 topographic maps. Site visits and walkovers by project personnel were carried out on October 19-20, 2021 and June 18-19, 2022 (fall and late spring/early summer botany surveys); May 13, 2022 and May 26, 2022 (owls and breeding birds); May 18, 2022 (wildlife survey); May 26 and June 1-2, 2022 (site reconnaissance); and October 22, 2021 (lichen survey). Key project personnel included Patrick Stewart (M.Sc.), Hayley Doyle (B.Sc. Environmental Science), and Heather Levy (B.Sc. Hons. Environmental Science) (background review, site reconnaissance, wetlands, water quality & fish habitat assessment); Ruth Newell, M.Sc. (botany survey); Mark Pulsifer, M.Sc. (wildlife); Tom Neily (lichens); and Mr. Fulton Lavender and Mr. Richard Hatch (bird surveys).

3 SITE LOCATION AND STUDY AREA

The Granite Village Quarry in Queens County is located approximately 6.3 kilometers west of the community of Port Joli, Queens County, Nova Scotia and 8.3 kilometers west of Sable River, Shelburne County, Nova Scotia at approximately UTM Zone 20, NAD83, Easting 341640 and Northing 4860429 and PID 70228531. The quarry is accessed by gravel road leading off Fisherman’s Memorial Highway (Highway 103). The study area for the assessment is shown on Figure 1; on Google Earth satellite imagery from August 2022 (Figure 2); and Figures 3 to 5. The proposed quarry expansion area will be located entirely within the EA study area of 12.3 ha.



Figure 1. Project location shown on NTS 1:50,000 mapping (20P15).



Figure 2. Study area in relation to local site features in recent satellite image.



Figure 3. View of Dexter Granite Village Quarry, facing west, June 1, 2022.



Figure 4. View of east end of Dexter Granite Village Quarry, June 1, 2022.



Figure 5. Stockpile areas on the north end (*left*) and the northwest end (*centre*) and southwest end (*right*) of the quarry, June 1, 2022.

4 EXISTING ENVIRONMENT

4.1 PHYSICAL ENVIRONMENT

4.1.1 CLIMATE AND WINDS

The Granite Village Quarry is located inland from the Atlantic coast, approximately one kilometer from the head of Port L'Hebert inlet, at a low elevation of approximately 40 to 70 metres above sea level. The site is thus expected to experience periodic high onshore winds, particularly from the southwest, south and southeast associated with coastal weather systems, and as well a climate moderated in terms of temperature by the ocean. The site is located in the Sable Ecodistrict (Webb and Marshall 1999) which shares with the Rossignol Ecodistrict the earliest, warmest springs, the warmest summers and highest mean annual temperature of 7.1°C, in Nova Scotia. Average daily temperatures are moderate, ranging from a low of -4.6 °C in January to 19.4 °C in July and an annual average of 7.7 °C (Canadian Climate Normals 2022) (Figure 6). The Sable Ecodistrict has a high annual average precipitation of 1486.2 mm (measured at Liverpool), about 12% coming as snow, mainly in January (Canadian Climate Normals 2022). Rain falls predominantly in October-December and secondarily in March-April. Extreme daily precipitation events can be expected, as in most parts of Nova Scotia, in particular due to a tendency for more extreme weather events to occur as a result of global climate change. Fog is common along the Atlantic Coast, associated with southerly winds, and is a major problem in coastal areas of Southwest Nova Scotia, particularly in summer (Nav Canada 2001). Wind patterns are similar to other locations on the south shore of Nova Scotia—generally strongest in winter, predominantly from the west to northwest (December-February), shifting to west in the spring (March-May). Predominantly southwest winds in June to August shift back to the west for the fall (September-November) (Environment and Climate Change Canada 2016). In particular the site is potentially exposed to winds in strong north easterly gales which move along the Nova Scotia coast predominantly in winter.

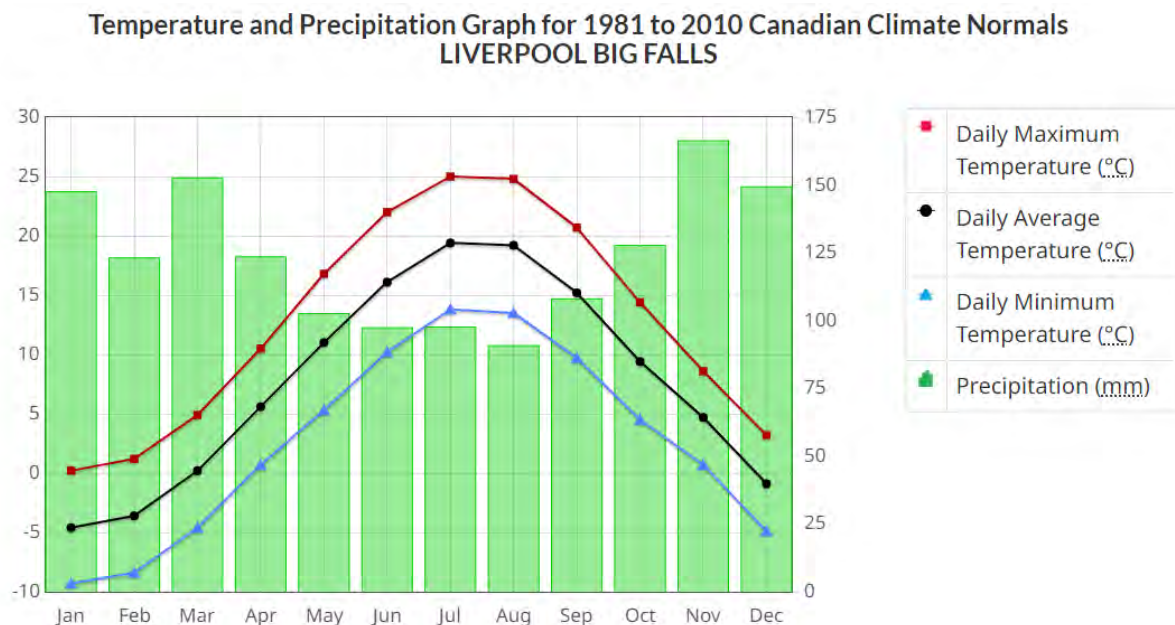


Figure 6. Annual precipitation and temperature cycle, Liverpool Big Falls (1981-2010) (Canadian Climate Normals 2022).

4.1.2 TOPOGRAPHY AND GEOLOGY

Landscape

The Granite Village Quarry and associated study area for the environmental assessment are located on the south shore of Nova Scotia in the Sable Ecodistrict, which includes areas inland from the coast from approximately Liverpool to Barrington (Bush and Baldo 2019). These areas include a generally level landscape with poor drainage, where much of the area is less than 60 metres above sea level, and only a few hills reach elevations higher than 100 metres. Wetlands occupy about 15% of the area, with bogs making up four-fifths of the wetlands (Bush and Baldo 2019). The typical landscape at the quarry is illustrated in Figure 3.

Typical of the Ecodistrict, the Granite Village Quarry site ranges from approximately 40 to 70 meters above sea level. Land at the northeast end is a plateau with irregular drainage that supports marsh, bog and shrub barren habitats. To the south and southwest, land slopes steeply through primarily deciduous forest with large boulders scattered throughout (Figure 7). Soil in this area is stony and well-drained with limited use for agriculture (Stea et al., 1992). Mixed forest and hardwood forest forms the land cover of the study site, and recent logging in the surrounding area of the quarry has reduced overall natural forest cover there.



Figure 7. Forest landscape at Granite Village Quarry, June 2, 2022.

Bedrock Geology

Bedrock which underlies the quarry is the Port Mouton pluton of middle-late Devonian monzogranite¹. The rocks of the pluton are dominantly coarse-grained granites, though lesser quantities of aplite (extremely fine-grained granitic rocks) and pegmatite (extremely coarse-grained granitic rocks) are present (Douma 1992). The contact with the Goldenville Group host rock is located approximately 500 metres from the quarry, although the precise location is poorly defined due to lack of outcrops (Figure 8).

¹ A form of granite.

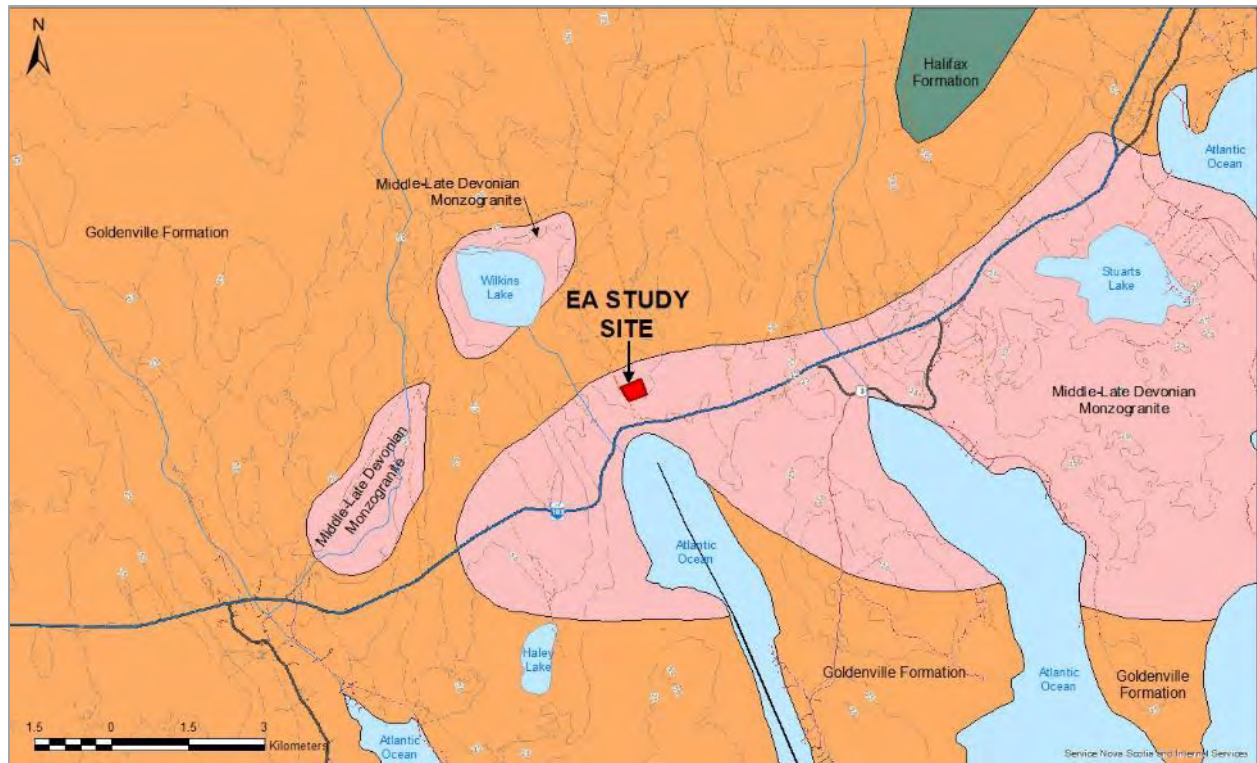


Figure 8. Bedrock formations in the vicinity of the Granite Village Quarry (Keppie 2000).

Surficial Geology

The landscape near the Granite Village Quarry is gently rolling with a very slight slope toward the Atlantic coast. The area is blanketed with a shallow layer of basal till derived largely from local bedrock, and at the study site is representative of a stony till plain consisting of a stony, sandy matrix with moderate to rapid drainage, depending on slope (Figure 9). The combination of flat to very shallowly sloping geography and relatively recently deposited glacial sediments has resulted in a poorly organized drainage system with abundant wetland. The combination of nutrient-poor, stony soil and poor drainage, has resulted in land typically having limited use for either agriculture or construction (Stea et al. 1992).

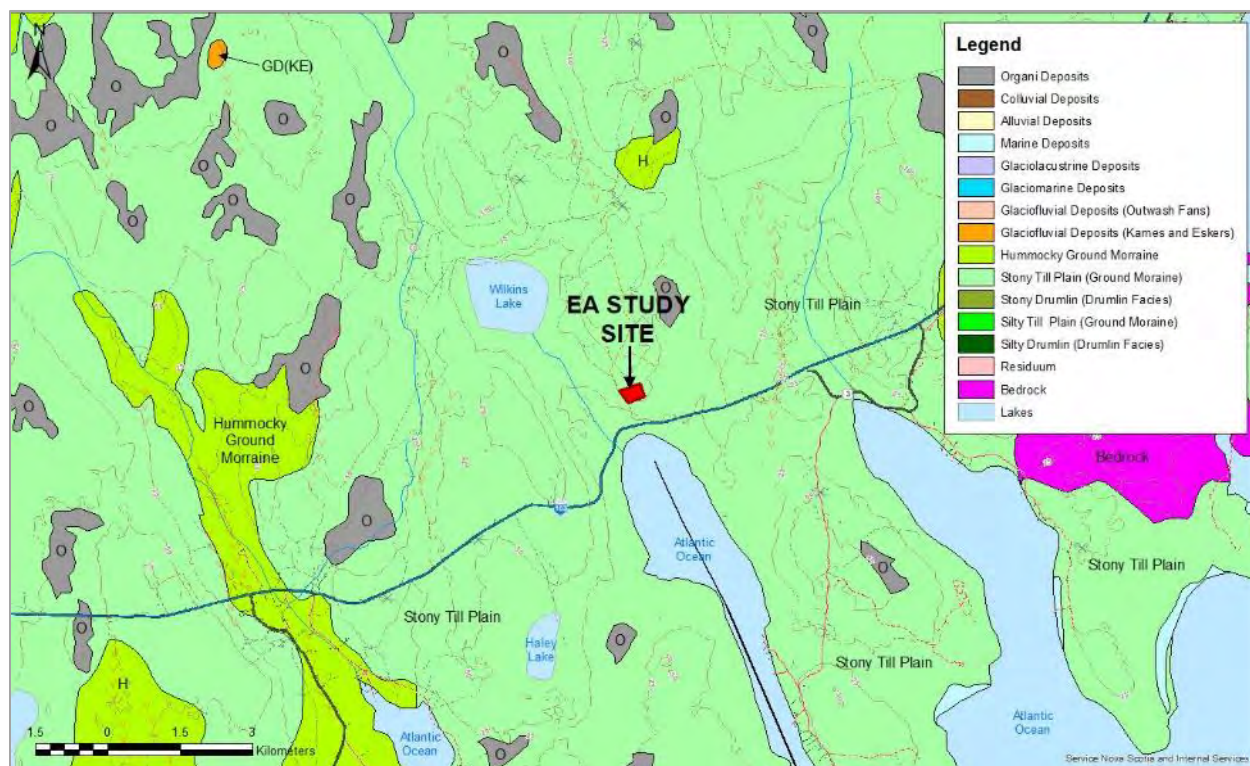


Figure 9. Surficial geology of the study area. From Stea et al. (1992) and digital version (2006).

4.1.3 AIR QUALITY, NOISE & LIGHT

The Granite Village area experiences low levels of artificial light, ambient noise, and high air quality. No large urban centres occur in the area which could be a source of artificial light; ambient noise levels at the quarry reflect traffic noise along Highway 103, as well as noise from traffic and operations of the quarry; and air quality is expected to be good due to the remote rural location and predominantly natural setting.

Vehicle lights from nearby Highway 103 would be the main sources of artificial light at the site, and due to the low population density, light levels are expected to be low. If lighting was used at the quarry for nighttime operations, 'skyshine' from operations when low clouds occur, might be seen from adjacent communities of East Side Port l'Hebert and Port Joli.

The vicinity of the Quarry is expected to have relatively high natural baseline air quality typical of areas with a high proportion of natural landscapes such as neighbouring forested wilderness areas, and also to open water such as Port l'Hebert and the largely undeveloped surrounding area. Low levels of human activity, including vehicle traffic along Highway 103, as well as that associated with quarry activities, have little impact on overall air quality at the site. Periodic dust and vehicle exhaust emissions from quarry activities as well as regular residential vehicle traffic are the main contributors to particulates and exhaust emissions, which are expected to be at low levels.

The quarry and associated movement of trucks and equipment would continue to provide a minor and periodic source of noise in the area. Operations at the quarry are periodic in response to demand for product and are likely one of the main noise sources in the area. Operational noise would not be heard in the closest communities to the site—East Side Port l’Hebert and Port Joli. Blasting occurs typically one to two times per year during years in which the quarry is active; operation of a portable crusher and heavy equipment may take place periodically and temporarily add to noise levels when the quarry is in operation; a portable asphalt plant may operate at the site periodically; and trucks are used to transport product and move the portable equipment as required. Typical noise includes blasting and sounds from the crusher and other heavy equipment operations (e.g. motors, generators, back-up signals etc.). The scope of operations, including annual production, for the quarry are not expected to change as the result of expansion, and ambient noise levels in general are expected to be localized. All trucks leaving the site are required to follow Dexter’s best operational practices, as well as those established by Truckers Association of Nova Scotia (TANS) and the Nova Scotia Road Builders Association (NSRBA), to minimize emissions. Noise levels arising from the quarry in the future will continue to meet the limits established in the Nova Scotia Pit and Quarry Guidelines and are expected to be consistent with those produced by the existing quarry operations at the site.

4.1.4 HYDROLOGY

The Granite Village Quarry is located on the divide between the 1ED-SD16 and 1ED-SD18 secondary watersheds that drain into Mitchell Brook to the east and Granite Village Brook to the west, respectively, and then into the Atlantic Ocean. Both secondary watersheds are a part of the greater Mersey River primary watershed. Uplands have shallow to non-existent overburden and occasional bedrock exposures, leading to rapid runoff after precipitation events overland; into ditches; or through intermittent flowages. Surface flow to the south as well as flow through ditches along the access road, meet a flowage running along the powerline utility corridor which crosses the access road approximately 150 metres south of the study area which eventually leads to an unnamed tributary of Granite Village Brook² (Figure 10; refer to Figure 22). An unnamed watercourse flows eastward as close as 200 metres from the north corner of the study area. Two ponds which are located adjacent to one another at the northeast end of the active quarry, share a marsh wetland; however the ponds have no inlets, outlets or channels and no flowages or culverts connecting them (Figure 11). These ponds appear to be man-made and were historically used to source small amounts of water for the quarry operation. They have not been used during recent quarry operations and are not planned to be used in the future. Vernal pools, swales and basins located outside of the study area, seasonally fill with water forming small pools (Figure 12).

Flows in watercourses in the vicinity of the site are expected to follow a seasonal pattern, with highest flows in the fall (October-November) and winter, peaking after snow melt in spring (April) and dropping to low, or non-existent levels in summer (July-September)—which is the pattern shown by the Mersey River (Figure 13). Much of the Mersey River watershed is forested and flows are expected to be moderate from sudden precipitation events, the occurrence of which is increasing overall due to patterns of climate change. Although increased flashiness of flows leaving the quarry may be expected, the Granite Village Quarry expansion area (12.3 ha) occupies only 0.39% of the 1ED-SD18 secondary watershed (2,276.30 ha) and 0.17%

² The unnamed tributary of Granite Village Brook runs north- south approximately 500 metres southwest of the Granite Village Quarry.

of the 1ED-SD16 secondary watershed (2,019.55 ha), and therefore is not expected to impact flows to a significant degree. A parallel Water Balance Assessment for the proposed quarry expansion area estimated that flows could change from -4.7 to 4.4 % under various development and reclamation scenarios. Impermeable surfaces such as access roads tend to channel some of the flow into ditches which will be dissipated passing downslope towards the surrounding watercourses.



Figure 10. Unnamed flowage south of the quarry site flowing west along the powerline utility corridor, June 1, 2022.



Figure 11. West pond (*left*) and east pond (*right*) located in the study area northeast of the quarry, June 1, 2022.



Figure 12. Vernal pool northwest of the quarry property, June 1, 2022.

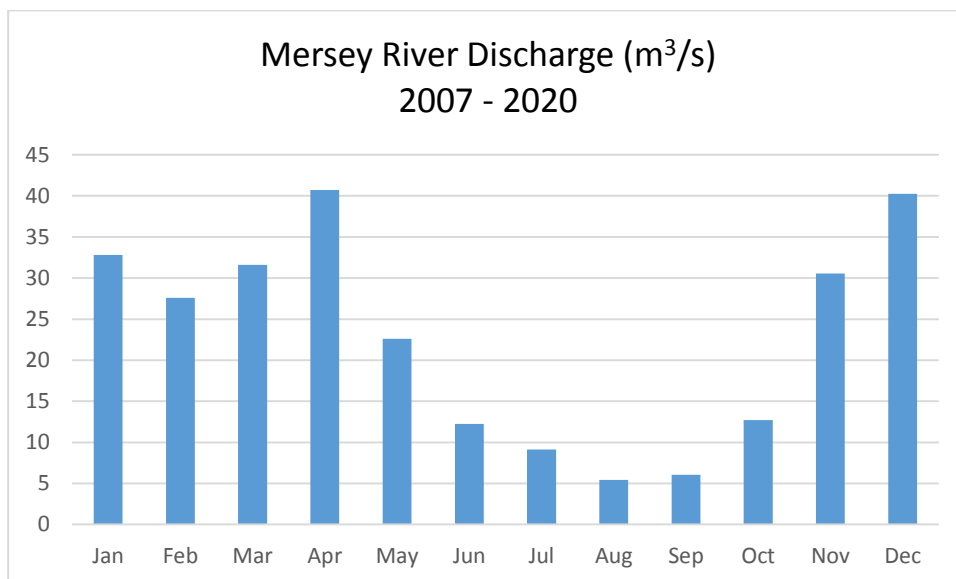


Figure 13. Seasonal pattern of streamflow in the vicinity of the site represented by average monthly discharge, Mersey River below George Lake, 2007 to 2020 (watershed area = 723 km²). Mersey River is located approximately 26 km northeast of the quarry.

4.1.5 HYDROGEOLOGY

The site is underlain predominantly by granite bedrock, with a thin veneer of glacial till and surface soil, and groundwater develops mainly in cracks and fractures, on horizontal surfaces between strata in bedrock, as well as in shallow till at the site. The water table at the site is below the floor of the quarry based on current understanding of drainage characteristics of the study area. The actual depth of the bedrock water table at the quarry site is not known, but it has not been encountered during previous quarry operations, and it is not anticipated that the quarry expansion will reach the bedrock water table. Surficial and shallow groundwater flow is anticipated to mirror the topographic slope, which although disorganized, flows predominantly south, southeast and southwest.

Precipitation reaching the quarry is expected to infiltrate the quarry floor or to leave via ditches and outflows into the surrounding forest; while some is expected to enter groundwater as seepage through cracks and fractures. Occasionally, retained surface water may accumulate on exposed bedrock, although it is not an expression of the groundwater table.

4.1.6 SOILS

Soil at the site is a well-drained light brown sandy loam over yellowish brown sandy loam (Halifax Sandy Loam), derived from olive gray sandy loam till (Cann and Hilchey 1959). The soils are stony, dominated by quartzite rock, and are usually thin yet firm over bedrock below resulting in negligible capability for agriculture. Wetlands in the vicinity are underlain by peat but not deep enough for commercial use (Anderson and Broughm 1988).

4.2 BIOLOGICAL RESOURCES AND HABITAT

4.2.1 TERRESTRIAL ENVIRONMENT

The site is in the Sable Ecodistrict (Bush and Baldo 2019) and vegetation reflects characteristics found throughout the ecodistrict, including predominance of softwood forest cover (about 75%), with a large proportion (~15%) of the landscape occupied by wetlands. In the ecodistrict, softwoods are dominated by Black Spruce on imperfectly drained soils with Red Spruce, Eastern Hemlock and White Pine on side slopes and more-well-drained soils (Bush and Baldo 2019). Mixed woods, which also occur at the site, include Red Spruce, Eastern Hemlock, White Pine, Red Oak, Sugar Maple, Yellow Birch and American Beech.

The proposed expansion area is largely in a natural state. Areas north of the quarry support natural stands of predominantly shade-tolerant deciduous forest with additional areas that have been cutover or modified and are regenerating (Map A-3). All plant species identified within the study area were non-invasive and consisted of both native species with secure populations in Nova Scotia, as well as exotic species. No species with potential to harm the environment or known to interfere with the ecological balance of the area were identified during botany and site reconnaissance surveys. Plant species found at the site during October 19-20, 2021 and June 18-19, 2022 (fall and late spring/early summer) botany surveys, are presented in the survey report (Appendix B).

Around the margins of the quarry and in areas that have been recently cleared for property access, where forest cover has been removed and drainage has been affected by quarry activities, a disturbed vegetated community occurs. These modified areas either drop abruptly in elevation or are level to gently sloping down to where they transition into the surrounding woodland; they are usually mesic or moderately dry. These open disturbed areas are generally vegetated with a mixture of native and non-native herbaceous

plant species (Figure 14; Figure 15). Herbaceous vascular plant species in these habitats include Bull Thistle (*Cirsium vulgare*), Queen Anne's Lace (*Daucus carota*), Common Hemp Nettle (*Galeopsis tetrahit*), Pineapple Weed (*Matricaria discoidea*), English Plantain (*Plantago lanceolata*), Common Plantain (*Plantago major*) and Colt's-foot (*Tussilago farfara*). Native herbaceous vascular plant species present include Rough Bent Grass (*Agrostis scabra*), Bristly Sarsaparilla (*Aralia hispida*), Wild Strawberry (*Fragaria virginiana*) and Pinweed (*Lechea intermedia*) with tree species including Trembling Aspen (*Populus tremuloides*) and Wire Birch (*Betula populifolia*).

Vascular plant species present in the recently cutover/grubbed barren area northeast of the open quarry area include: Elliot's Goldenrod (*Solidago latissimifolia*), Bracken Fern (*Pteridium aquilinum*), White Birch (*Betula papyrifera*), Large-toothed Aspen (*Populus grandidentata*), Sweet Fern (*Comptonia peregrina*), Black Huckleberry (*Gaylussacia baccata*) and Canada St. John's-wort (*Hypericum canadense*).

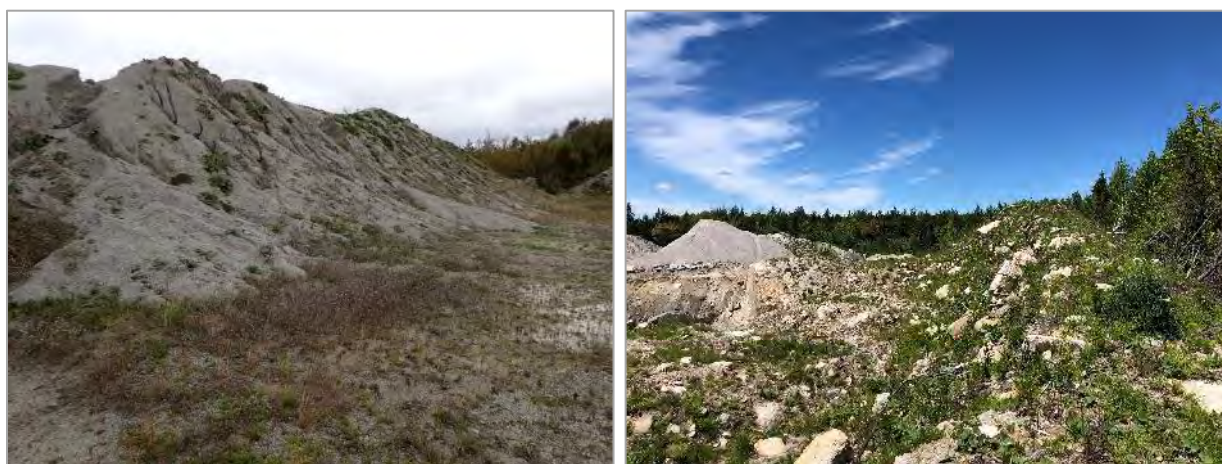


Figure 14. Open disturbed areas of the quarry's edge vegetated primarily with both native and non-native, and generally weedy species. Photos by R. Newell, October 2021 botany survey (left); June 1, 2022 (right).



Figure 15. Cutover/grubbing activity northeast of the open quarry pit. Photos by R. Newell, October 2021 botany survey (left); June 1, 2022 (right).

Shrub barrens with occasional bog habitat occurs within and beside the ponds and associated wetlands northeast of the quarry (Figure 16). The barrens are primarily open habitat dominated by a variety of shrubs, predominantly Black Huckleberry (*Gaylussacia baccata*) with occasional young tree components including Red Maple (*Acer rubrum*), White Pine (*Pinus strobus*), Red Spruce (*Picea rubens*), Red Oak (*Quercus rubra*) and Balsam Fir (*Abies balsamea*). Other plant species present within this barren habitat include Bracken Fern (*Pteridium aquilinum*), Bunchberry (*Cornus canadensis*), Northern Bayberry (*Morella pensylvanica*) and Wild Sarsaparilla (*Aralia nudicaulis*).



Figure 16. Small bog-like area that occurs within the shrub barren Photo by R. Newell, June 2022 botany survey.

Primarily deciduous woodland occupies slopes along the south and southeast side of the quarry property. Areas near the eastern boundary of the property, east of the existing quarry and two ponds and associated wetlands, support mixed wood forest while hardwood species dominate the south and southeast sides of the study area (Figure 17). Tree species present in these areas include Red Oak (*Quercus rubra*), Red maple (*Acer rubrum*), Moose Maple (*Acer pensylvanicum*), White Birch (*Betula papyrifera*), Red Spruce (*Picea rubens*) and Balsam Fir (*Abies balsamea*). Shrubs are abundant within this habitat and include American Witch-hazel (*Hamamelis virginiana*), Black Huckleberry (*Gaylussacia baccata*), Sheep Laurel (*Kalmia angustifolia*), Witherod (*Viburnum nudum* var. *cassinoides*), Common Winterberry (*Ilex verticillata*) and Northern Bayberry (*Morella pensylvanica*). Herbaceous vascular plant species present include Wild Sarsaparilla (*Aralia nudicaulis*), Bunchberry (*Cornus canadensis*), Mayflower (*Epigaea repens*), Eastern Teaberry (*Gaultheria procumbens*), Cinnamon Fern (*Osmundastrum cinnamomeum*) and Bracken Fern (*Pteridium aquilinum*). These forested areas also featured large boulders throughout the forested habitat (Figure 18).



**Figure 17. Primarily deciduous woodland occurring along the south and southeast side of the quarry property.
Photo by R. Newell, June 2022 botany survey.**



Figure 18. Large boulders scattered throughout the woodland habitat. Photos by Ruth Newell, June 2022 botany survey, June 2, 2022.

4.2.2 AQUATIC ENVIRONMENT

The study area is on a height of land separating two sub-watersheds and does not have watercourses passing through it. However, it contains two permanent ponds located on the northwest side of the existing quarry. A vernal pond occurs outside the property to the west (refer to Figure 12). Several small flowages were

observed where surface water had accumulated and was present at the time of the survey (Figure 19). These take the form of small pools and channels between rocks and outcrops and are intermittent; there are no permanent, first-order streams on site. Surface water flows intermittently in ditches along the access road, natural flowages and occasional subterranean flows that move downslope.



Figure 19. Intermittent and subterranean flowages observed at the Granite Village Quarry along the east margin of the expansion area (left) and southeast corner of the property (right), June 1, 2022.

The ponds located immediately northeast of the existing quarry share a marsh wetland to the north that transitions to bog-like at the northeast end (Figure 20). The two ponds are separated by berm with a lane / trail coming from the existing quarry but no culvert connecting the two; the ponds at one time were used as a source of water for quarry operations, however they have not be used as part of recent operations and are not planned to be used in the future. Vascular plants occurring within and adjacent to the ponds include Broad-leaved Cattail (*Typha latifolia*), Bebb's Willow (*Salix bebbiana*), Fowl Manna Grass (*Glyceria striata*), Elliot's Goldenrod (*Solidago latissimifolia*), Sensitive Fern (*Onoclea sensibilis*), Red Maple (*Acer rubrum*), alders (*Alnus alnobetula* ssp. *crispa* and *Alnus incana* ssp. *rugosa*), Cinnamon Fern (*Osmundastrum cinnamomeum*), Trembling Aspen (*Populus tremuloides*), Steeplebush (*Spiraea tomentosa*), Soft Rush (*Juncus effusus*) and Common Woolly Bulrush (*Scirpus cyperinus*). Aquatic animals found in the ponds include variety of amphibians (Green Frog were heard and a Bullfrog and salamanders were seen, Figure 31)

The ponds may have been occupied periodically by beavers, as evidenced by the presence of felled trees near the margins of the more westerly pond. Nearshore sediments of the pond are predominately soft with occasional cobble and boulder and emergent and submergent vegetation, woody debris and some leaf litter.



Figure 20. Two ponds located northeast of the active quarry pit dominated by cattails (*Typha* sp.), the larger of the two ponds to the west (*left*) and the smaller to the east (*right*). Photos by R. Newell, October 2021 botany survey.

4.2.3 WATER QUALITY

Surface water quality is moderate to high and is expected in natural environmental settings (Table 1; Figure 22). Conductivities and suspended sediment levels are low, with the exception of the West Pond (WS1) which had moderate TSS (18 mg/L) which could be attributed to the amount of vegetation and organic productivity and associated particulate matter in the pond in comparison to the east pond and other sampling sites³. Dissolved oxygen levels were generally above guideline ranges for the protection of freshwater aquatic life (CCME 1999) (Table 1); low oxygen levels in the two ponds northeast of the existing quarry, were typical of standing waters with no observable flow and therefore not expected to be due to impacts of activities at the quarry. Characteristics of surface waters downslope from the Quarry to the south (sampling location WS5 and WS6; Figure 21), were similar to those in the flowage along the east boundary line (WS3) (Table 1).

³ Water quality measurements were made during the June 1 and 2, 2022 field survey at several locations, including: the east and west ponds located northwest of the quarry (WS1 and WS2); a small flowage observed along the eastern boundary of the study area (WS3)(Figure 22). Three sampling sites within the vicinity of the quarry included a vernal pool north of the study area (WS4) and two in ditches along the access road (WS5 and WS6; Figure 21).

Table 1. Water quality measurements in surface waters at the Granite Village Quarry and vicinity. Locations are shown in Figure 23.						
Site Location & Date	June 1, 2022					
	Granite Village Quarry			Granite Village Quarry Vicinity		
	WS1	WS2	WS3 ¹	WS4	WS5 ¹	WS6
Site Description	West Pond	East Pond	Subterranean Flowage at the East End of the Study Area	Vernal Pool	Access Road Culvert Outflow	Powerline Utility Corridor Culvert Outflow
Temperature °C	14.9	16.4	10.8	12.0	16.1	16.3
Dissolved Oxygen (mg/L)	1.9	2.6	6.2	7.2	6.2	5.9
Dissolved Oxygen (% saturation)	27.6	28.5	55.6	70.3	64.0	63.2
Conductivity (µS/cm)	36.3	38.0	26.5	38.7	43.8	21.5
Specific Conductivity (25°) (µS/cm)	45.4	45.3	36.5	51.4	52.8	25.7
pH	6.0	6.0	--	4.8	--	5.1
TSS (mg/L)	18.0	5.0	--	1.0	--	0.5

Note: TSS = Total Suspended Solids.
¹ Water levels at sampling sites were too low for the collection of pH and TSS samples.



Figure 21. Water quality sampling locations along the access road: beside the quarry (WS5; left); and at a flowage along the powerline corridor (WS6; right).

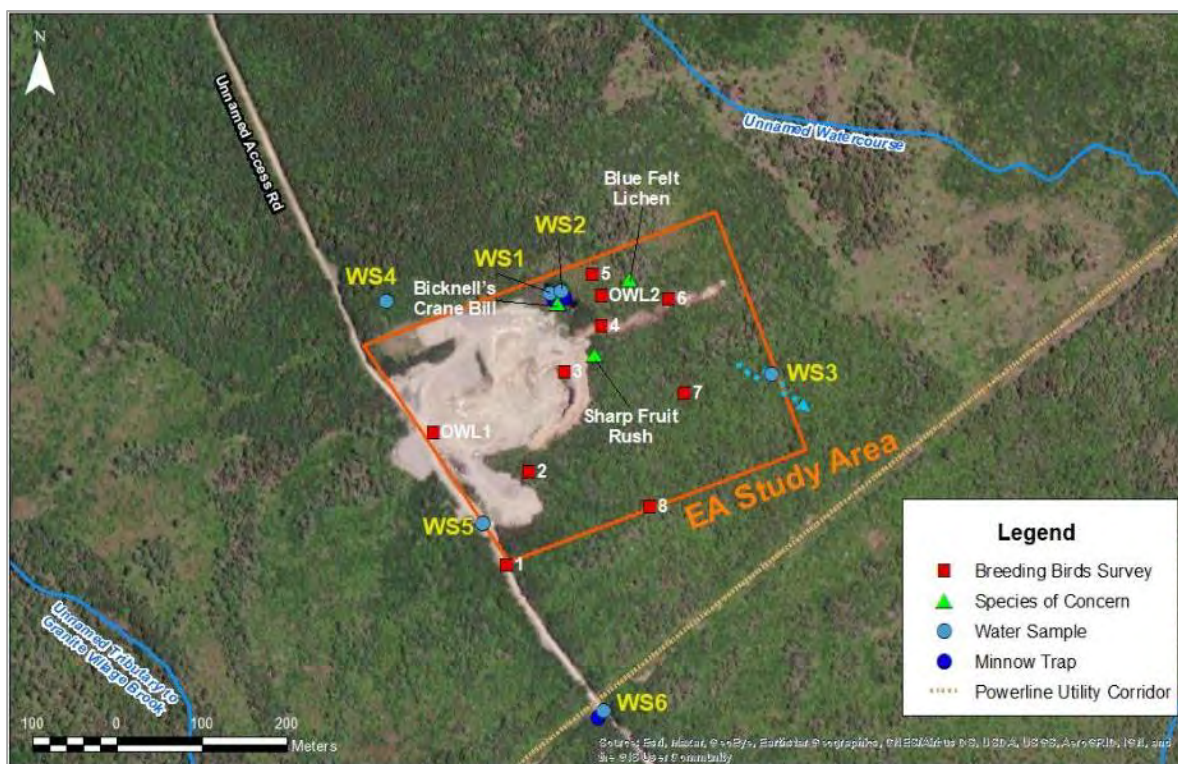


Figure 22. Field survey locations for water quality, fish (minnow traps), and breeding bird and owl surveys. Also shown are locations for Species of Conservation Concern identified during surveys (June 2022).

4.2.4 WETLANDS

Wetlands are areas of land that are periodically or permanently flooded, have characteristic soils, and support particular types of vegetation which are adapted to life in such environments. The quarry property and proposed expansion area are moderately sloped and moderately well-drained; however parts are poorly drained and support wetlands. Wetlands at the site include: a large, predominantly marsh wetland that transitions to bog-like, scattered bog habitat within shrub barrens; and treed/shrub swamps (Figure 23; Table 2).

The primarily marsh wetland that transitions to bog-like toward the northeast, is shared by two small ponds, located on the higher elevation plateau and higher elevations bordering the existing quarry to the northwest (Figure 24). Vascular plants occurring in the marsh habitat adjacent to and northeast of the two ponds include Fowl Manna Grass (*Glyceria striata*), Crested Wood Fern (*Dryopteris cristata*), Spinulose Wood Fern (*Dryopteris carthusiana*), White Meadowsweet (*Spiraea alba* var. *latifolia*), a cottongrass (*Eriophorum* sp.), Soft Rush (*Juncus effusus*), Sweet Gale (*Myrica gale*) and Large Cranberry (*Vaccinium macrocarpon*). Wetland furthest away from the two ponds, where the wetland habitat transitions to more bog-like, consisted of Labrador-tea (*Rhododendron groenlandicum*), Bayberry (*Morella pensylvanica*), Canada Holly (*Ilex verticillata*), Sheep Laurel (*Kalmia angustifolia*), Large Cranberry (*Vaccinium macrocarpon*) and Bog Aster (*Oclemena nemoralis*). Sphagnum mosses (*Sphagnum* spp.) are also more prevalent in this section of the wetland. Scattered bog habitats occur within open shrub barrens at the northeast end of the study area,

situated adjacent to the two ponds and associated wetland and the trail leading from the existing quarry to the east boundary (Figure 25). The scattered bog areas range in size and consist of sphagnum mosses (*Sphagnum* spp.), Cinnamon Fern (*Osmundastrum cinnamomeum*), Labrador-tea (*Rhododendron groenlandicum*), Common Woolly Bulrush (*Scirpus cyperinus*), Bristly Dewberry (*Rubus hispidus*), Sheep Laurel (*Kalmia angustifolia*), Three-seeded Sedge (*Carex trisperma*) and White Meadowsweet (*Spiraea alba* var. *latifolia*). Two small, treed, basin swamps occur at lower elevations near the base of slopes in the south-central part of the study area where drainage is predominantly south to southwest (W3 and W4, Figure 23), and are likely connected beneath the surface (Figure 26). These wetlands support several small vernal pools and intermittently wet depressions which were dry and showed cracked soil. One large vernal pool (W5, Figure 23) was identified outside the study area near the northwest corner of the property.

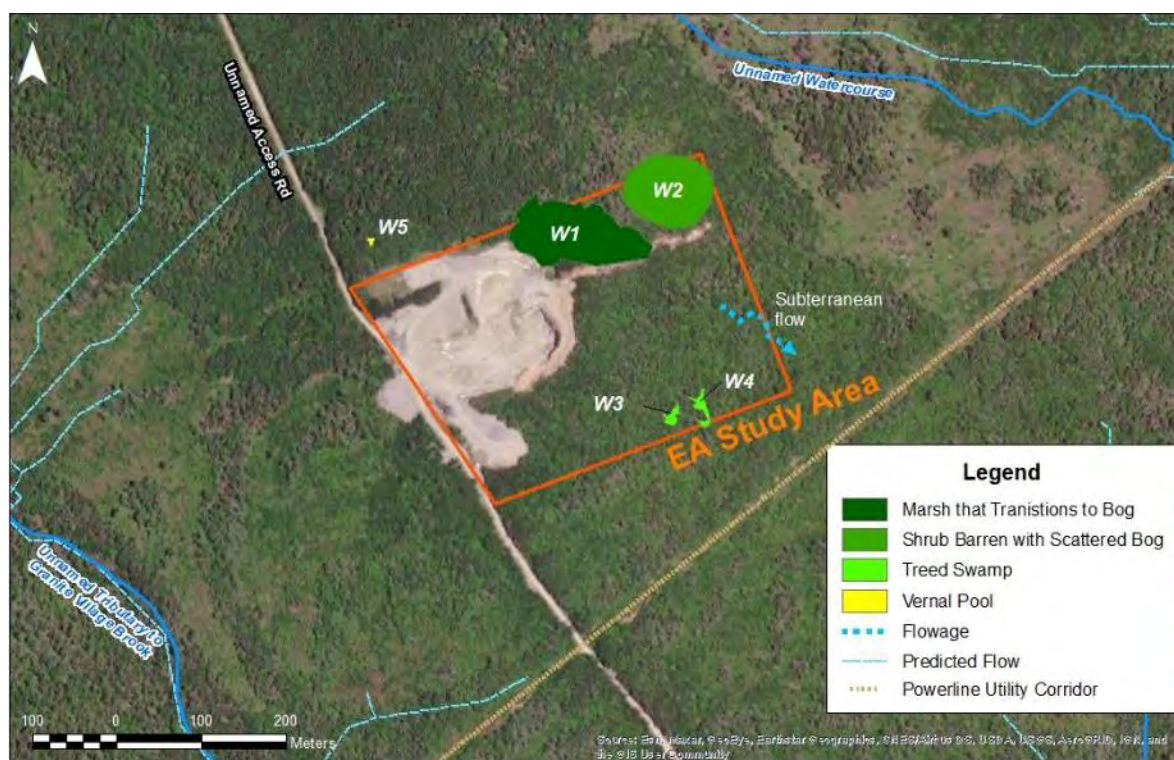


Figure 23. Wetlands at Granite Village Quarry.

Table 2. Wetlands, Granite Village Quarry Expansion. Locations shown in Figure 24. Areas presented are for the entire wetland, which may extend outside the study area.		
Identification	Area (ha)	Wetland Type and Comments
W1	0.966	Primarily marsh wetland that transitions to bog
W2	0.740	Shrub barrens with scattered bog
W3	0.029	Treed swamp
W4	0.043	Treed swamp
W5	0.006	Vernal pool



Figure 24. Marsh (*left*) and bog (*right*) wetland adjacent to and northeast of the two ponds. Photos by R. Newell, October 2021 botany survey.



Figure 25. Bog habitat occurring within the shrub barrens located at the northeast corner of the quarry property, June 2022.



Figure 26. Treed basin swamp located near the south-central boundary of the study area, June 2, 2022.

4.2.5 FISH & FISH HABITAT

No fish habitat was observed at the site—there are no streams or water bodies which could support fish. Streams in the area originate from precipitation, and groundwater flow, and are seasonally intermittent. Only a single small intermittent and subterranean flowage near the east boundary of the study area flows off the property to the east (Figure 27). This flowage potentially leads to the headwaters of an unnamed stream that eventually drains into the Atlantic Ocean at the Port L’Hebert inlet southeast of the study area. Flows occurring near the study area at the time of the survey were low, intermittent and subterranean, with low potential suitability for fish. Occasional runoff from the working quarry may enter ditches along the access road, draining the site and reaching the flowage that occurs south of the study area along the powerline utility corridor, eventually entering an unnamed tributary of Granite Village Brook (Figure 28). No fish were captured within the two ponds adjacent to the existing quarry or in the flowage that occurs along the powerline utility corridor⁴.



Figure 27. Small flowage located off on the boundary of the study area flowing east, away from the quarry property, June 2, 2021.

⁴ Minnow traps were set for approximately 24 hours at sites shown in Figure 22.

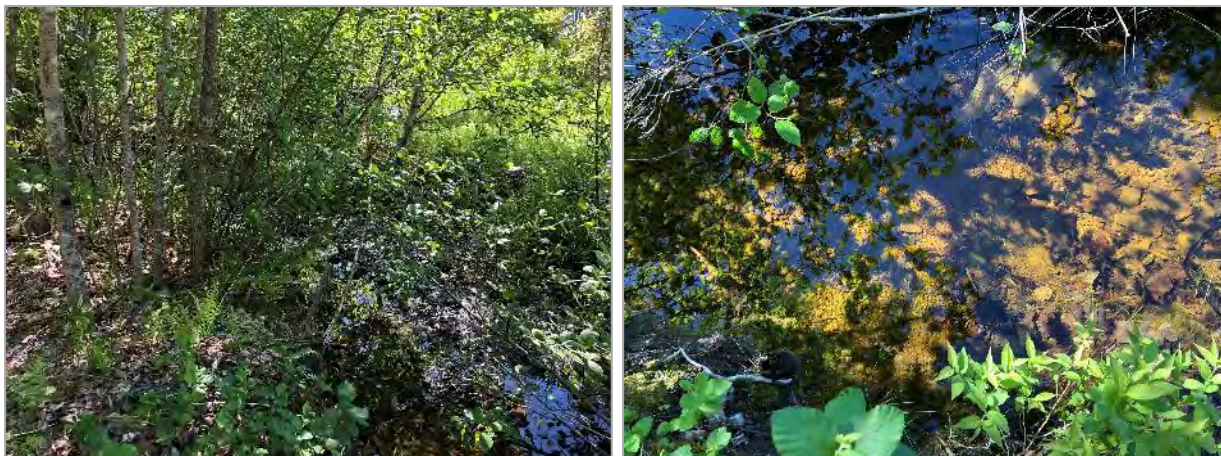


Figure 28. Unnamed flowage along the powerline utility corridor located south of the study area, June 1, 2022.

4.2.6 BIRDS

Birds are one of many animal groups which live in the natural environments at the site and which contribute to the functioning of the terrestrial and wetland ecosystems in the vicinity of the Granite Village Quarry. Occurrence of birds was assessed by means of reviews of available literature; as well as standard surveys for owls and breeding birds conducted in late May, 2022⁵. Thirty-four species of birds were observed during the survey, summarized in Table 3, which accounted for approximately 50% of seventy-seven species of birds which have been recorded as potentially breeding in the study area (Maritimes Breeding Bird Atlas 2022, Lower South Shore Region 18; Table 4). Northern Flicker, Pileated Woodpecker, Ruffed Grouse and a Sharp-Shinned Hawk were also observed (Table 3).

No avian species of conservation concern were found in either the owl or breeding bird surveys. The songbird community in deciduous woodland areas at the quarry (Sites 1, 2 and 8; refer to Figure 22) was dominated by Hermit Thrush, Ovenbird, American Robin, and Dark-eyed Junco, each of which occurred at two of the three sites and in low abundance. Low numbers overall can be attributed to the sampling date which was early in the migration period, and also to cool temperatures encountered, although most of the species encountered were expected to occur.

A mixture of habitats in the study area, including mixed forest, shrub barren and bogs (Sites 3 to 7; refer to Figure 22), were occupied by a community occupied predominantly by Ovenbird, Hermit Thrush, Black-capped Chickadee, Yellow-Rumped Warbler, Magnolia Warbler, Northern Parula Warbler, and Black and White Warbler (Table 3). Hermit Thrush and Dark-eyed Junco occurred at all sites; and Yellow-Rumped

⁵ A survey for owls was conducted on May 13, 2022 beginning at 0245 hrs, during which the observers listened for an hour at each of two sites. Playback of calls was not possible due to an equipment malfunction. Conditions were ideal, with low winds, clear skies and a three-quarter moon. The breeding bird survey was conducted from 0518 hrs to 0838 hrs under calm conditions and clear sky, at pre-selected sites chosen to represent different forest habitat types and also be close enough together to allow the observers to move between sites within the prescribed early morning period which is optimal. At each site the principal observer listened for 10 minutes and the birds observed, their direction, and approximate distance from the observer were noted.

Warbler, Magnolia Warbler, and Northern Parula Warbler each occurred at four sites. Black-capped Chickadee and Yellow-Rumped Warbler were most abundant, although only reaching 3 and 2 individuals /10 minute observation period respectively at the sites where they were most abundant.

Total number of species (Species Richness) at the quarry ranged from low (4 species at Site 3) to moderate (20 and 21 species at Sites 6 and 4 respectively)—and 37 species overall. The mixed habitat sites were higher in total abundance, overall species per habitat, and average species per site (Table 3). Other birds identified at or in the general area of the site during site visits included American Woodcock and Common Loon.

Observation conditions for the May 13, 2022 owl survey were ideal, including calm winds and clear sky with a ¾ moon (air temperature 9°C). Two sites (refer to Figure 22) were surveyed, each for 1 hour. Due to a tape recorder malfunction, owls observed were those calling normally. Owls were heard at both observation sites, and the same owls were heard at both due to the close proximity of the sites. These included: 3 pairs and one individual Saw-whet Owls; one Great-Horned Owl; and 14 Barred Owl. All of the owls were outside the proposed expansion area for the quarry.

Table 3. Bird species heard or observed during dawn bird surveys conducted May 26, 2022, between 05:28 and 8:38 hrs at the Granite Village Quarry study site. For locations of observation points, see Figure 23.

Bird Species	Deciduous Woodland (Sites 1, 2 and 8)		Mixed Forest, Shrub Barren and Bogs (Sites 3, 4, 5, 6, and 7)	
	No. of sites	Average/ 10 mins	No. of sites	Average/ 10 mins
PASSERIFORMES				
American Goldfinch	1	0.33	1	0.20
American Redstart	1	0.33	1	0.20
American Robin	2	1.00	2	0.40
Bay-Breasted Warbler	0	0.00	3	1.00
Black-and-White Warbler	1	0.33	3	0.80
Blackburnian Warbler	0	0.00	1	0.20
Black-capped Chickadee	1	0.33	4	1.60
Black-Throated Blue Warbler	1	0.33	2	0.40
Black-Throated Green Warbler	0	0.00	1	0.20
Blue-headed Vireo	1	0.33	0	0.00
Blue Jay	0	0.00	1	0.20
Chestnut-Sided Warbler	1	0.33	1	0.20
Common Raven	0	0.00	1	0.20
Common Yellowthroat	0	0.00	2	0.40
Dark-Eyed Junco	2	0.67	2	0.40
Hermit Thrush	2	1.00	5	1.00
Least Flycatcher	0	0.00	1	0.20
Magnolia Warbler	1	0.33	4	0.80
Northern Parula	0	0.00	4	1.00
Ovenbird	2	1.00	5	1.20
Palm Warbler	0	0.00	2	0.40
Purple Finch	0	0.00	1	0.20

Red-eyed Vireo	1	0.33	3	0.60
Ruby-Throated Hummingbird	1	0.33	0	0.00
Song Sparrow	1	0.33	0	0.00
Swainson's Thrush	0	0.00	3	0.80
White-throated Sparrow	0	0.00	2	0.60
Yellow-Rumped Warbler	1	0.33	4	1.20
CHARADRIFORMES				
Wilson's Snipe	1	1.0	0	0
GALLIFORMES				
Ruffed Grouse	1	0.33	2	0.40
PICIFORMES				
Northern Flicker	1	0.33	1	0.20
Pileated Woodpecker	0	0.00	1	0.20
Yellow-Bellied Sapsucker	1	0.33	1	0.40
FALCONIFORMES				
Sharp-Shinned Hawk	0	0.00	1	0.20
SUMMARY				
Average Abundance	8.67		15.8	
Total Species per Habitat	19		30	
Average Species/Site	7.0		12.0	

Table 4. Birds potentially breeding in the Granite Village area of Queens County (Maritime Breeding Bird Atlas-Online 2022). Map 20PR49.

SWANS, GEESE & DUCKS (ANSERIFORMES: ANATIDAE)	
Canada Goose	Northern Shoveler
Wood Duck ‡	Green-winged Teal
Gadwall ‡	Ring-necked Duck
American Black Duck	Common Eider §
Mallard	Common Merganser
Blue-winged Teal	Red-breast Merganser ‡
PHEASANTS, GROUSE, TURKEYS & LOONS (GALLIFORMES, PHASIANIDAE)	
Ring-necked Pheasant	Spruce Grouse
Ruffed Grouse	Common Loon
PETRELS & CORMORANTS (PROCELLARIIFORMES, SULIFORMES)	
Leach's Storm-Petrel ‡§	Great Cormorant ‡§
Double-crest Cormorant §	
BITTERNS, EGRETS & HERONS (PELECANIFORMES)	
American Bittern‡	Green Heron †
Great Blue Heron §	Black-crown N.-Heron †§
Snowy Egret ‡	
HAWKS & FALCONS (FALCONIFORMES: ACCIPITRIDAE, FALCONIDAE)	
Osprey	Red-should Hawk †
Bald Eagle ‡¶	Broad-winged Hawk
Northern Harrier	Red-tailed Hawk
Sharp-shinned Hawk	American Kestrel
Northern Goshawk ‡	Merlin ‡
Common Nighthawk †	

SHOREBIRDS	
PLOVERS, SANDPIPERS, SNIPES & GULLS (CHARADRIIFORMES, SCOLOPACIDAE)	
Semipalmated Plover †	Ring-billed Gull †§
Piping Plover †	Herring Gull §
Killdeer	Great Black-backed Gull §
Spotted Sandpiper	Common Tern §
Willet	Arctic Tern †§
Wilson's Snipe	Black Guillemot †§
American Woodcock	Atlantic Puffin †
PIGEONS, DOVES & CUCKOOS (COLUMBIFORMES: COLUMBIDAE, CUCULIFORMES)	
Rock Pigeon	Black-billed Cuckoo †
Mourning Dove	
OWLS (STRIGIFORMES)	
Great-horned Owl	Long-eared Owl †
Barred Owl	North Saw-whet Owl
SWIFTS (APODIFORMES, APODIDAE) AND HUMMINGBIRDS (APODIFORMES, TROCHILIDAE)	
Chimney Swift †	Ruby-throated Hummingbird
KINGFISHERS (CORACIIFORMES, ALCEDINIDAE)	
Belted Kingfisher	
WOODPECKERS (ORDER PICIFORMES, PICIDAE)	
Yellow-bellied Sapsucker	Black-back Woodpecker †
Downy Woodpecker	Northern Flicker
Hairy Woodpecker	Pileated Woodpecker
SONGBIRDS (PASSERIFORMES)	
Olive-sided Flycatcher †	Common Yellowthroat
Eastern Wood-Pewee	American Redstart
Yellow-bellied Flycatcher	Cape May Warbler †
Alder Flycatcher	Northern Parula
Least Flycatcher	Magnolia Warbler
Eastern Phoebe †	Bay-breasted Warbler
Gr Crested Flycatcher	Blackburnian Warbler
Eastern Kingbird	Yellow Warbler
Blue-headed Vireo	Chestn-sided Warbler
Philadelphia Vireo †	Blackpoll Warbler
Red-eyed Vireo	Black-thr Blue Warbler
Gray Jay	Palm Warbler
Blue Jay	Yellow-rumped Warbler
American Crow	Black-thr Green Warbler
Common Raven	Canada Warbler †
Tree Swallow	Wilson's Warbler
Bank Swallow §	Chipping Sparrow
Cliff Swallow §	Vesper Sparrow †
Barn Swallow	Savannah Sparrow
Black-capp Chickadee	Nelson's Sh.-tail Sparrow
Boreal Chickadee	Fox Sparrow
Red-breast Nuthatch	Song Sparrow
White Breast Nuthatch †	Lincoln's Sparrow †
Brown Creeper	Swamp Sparrow
Winter Wren	White-throat Sparrow
Golden-crown Kinglet	Dark-eyed Junco

Ruby-crown Kinglet	Scarlet Tanager †
Eastern Bluebird †	Northern Cardinal ‡
Veery	Rose-breast Grosbeak ‡
Bicknell's Thrush †	Indigo Bunting ‡
Swainson's Thrush	Bobolink
Hermit Thrush	Red-wing Blackbird
Wood Thrush †	Rusty Blackbird †
American Robin	Common Grackle
Gray Catbird	Brown-head Cowbird
Northern Mockingbird †	Baltimore Oriole ‡
Brown Thrasher †	Pine Grosbeak
European Starling	Purple Finch
Cedar Waxwing	House Finch †
Ovenbird	Red Crossbill †
North Waterthrush ‡	White-winged Crossbill
Black-white Warbler	Pine Siskin
Tennessee Warbler	American Goldfinch
Nashville Warbler	Evening Grosbeak
Mourning Warbler	House Sparrow

This list includes all species found during the Maritimes Breeding Bird Atlas (1st atlas: 1986-1990, 2nd atlas: 2006-2010) in the region #18 (Shelburne County).
Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), † (rare in the Maritimes) or † (rare in the Maritimes, documentation only required for confirmed records). Current as of 16/05/2022. 20PR49.

Most bird species common to the area can be observed from March to September in open, forested and wetland habitats (Figure 29). A number of significant habitats for migratory birds are located in the general vicinity of the site. An area two kilometers northwest of the study site, adjacent to Wilkins Lake is Osprey habitat (Kydd, personal communications, 2022). The South Shore of Nova Scotia (Shelburne County to Halifax County) also features sand and pebble beaches that are relied upon by a variety of shorebirds, including the endangered Piping Plover (*Charadrius melodus melodus*). In 2021, there were 52 breeding pairs of Piping Plovers in Nova Scotia and breeding occurs on approximately 30 beaches across the Province (Bartlett 2021). Piping Plovers nest in spring from May to July on white sand beaches and tidal flats with gravel or cobble areas and little vegetation, which are not found at the quarry site. Nesting for other bird species of conservation concern that have been observed within a five kilometer radius of the site, is primarily between early-May to late-August (Figure 30).

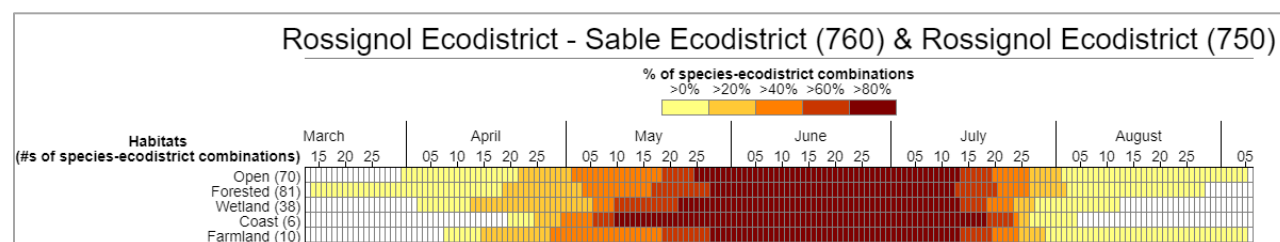


Figure 29. Nesting periods for various habitats in the larger Rossignol Ecodistrict which encompasses the Sable Ecodistrict (760) and Rossignol Ecodistrict (750) (Rousseu and Drolet 2015).

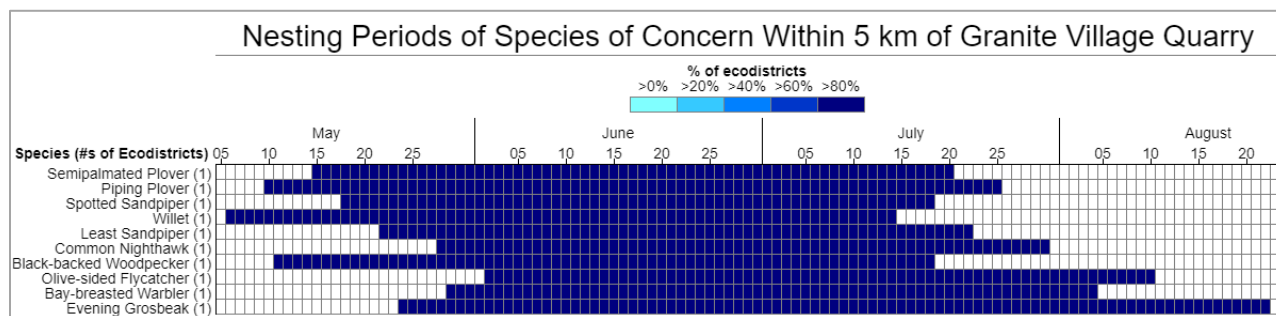


Figure 30. Nesting periods for bird Species of Concern found within five kilometers of Granite Village Quarry Source (Rousseu and Drolet 2015).

4.2.7 MAMMALS

Various mammal species, both large and small, including game and furbearing species, are found in Queens and Shelburne Counties and may occur periodically at the quarry site. Mammals expected to occur regularly or occasionally reflect the dominant terrestrial habitat in the surrounding area, which includes coniferous and mixed forest, as well as bog and barren. White-tail Deer, Eastern Coyote, Snowshoe Hare and Red Squirrel occur at the site, based on observations during the designated mammal survey (Appendix C); former beaver activity was observed adjacent to one of the ponds located northeast of the active quarry site on June 1-2, 2022; and a black bear was observed crossing Highway 103 approximately one kilometer from the Quarry. These species and others may utilize the study area seasonally as part of their home range. Moose have also been reported in the general area of the study site, the closest record being 2.3 kilometers from the property, and the area is designated as important habitat as part of an area of concentration in southwestern Nova Scotia (NSNRR 2021). Other mammals that may occur in the general area include American Fisher and American Marten, although neither have been documented within 10 kilometers of the study area. Rodents and other small mammals potentially utilizing the area include Raccoon, Short-Tailed Weasel, Red Fox, mink, otter, white-footed deer mice, deer mice, chipmunks and northern flying squirrel.

Three endangered bats (Little Brown Bat, Northern Myotis Bat and the Tri-coloured Bat) which were formerly relatively common throughout Nova Scotia, are now federally and provincially listed as endangered due to recent population declines due to a fungus infection (White Nose Syndrome). Distributions are centred in areas where there are overwintering sites (hibernacula--where bats overwinter and raise young) which are not infected. Hibernacula are typically located in abandoned mine shafts, caves and old buildings. There are no abandoned mines within five kilometers of the quarry (Nova Scotia 2021) and the nearest caves formerly harbouring bats is in the Ovens Natural Park in Lunenburg, Lunenburg County (Moseley 2007). There is not likely to be a cave which can serve as a hibernaculum at the site and none were observed incidentally as part of site surveys. From hibernacula bats range widely in the summer, localizing in areas with a good food supply. Because of low population numbers overall, occurrences of significant numbers of roosting and feeding individuals in any areas in particular are unlikely.

4.2.8 REPTILES AND AMPHIBIANS

Some of the common Nova Scotian amphibians and reptiles are expected to occur at the site. The small ponds and intermittent flowages and adjacent riparian areas likely support amphibian species such as Leopard Frog, Wood Frog, Green Frog, Pickerel Frog, American Toad, American Bullfrog, Spring Peeper and salamanders (e.g. Red-spotted Newt, Blue-spotted Salamander, Yellow-spotted Salamander, and Eastern Redback Salamander). An American Bullfrog was observed in the east pond with several more heard northeast of the active quarry and three salamanders, including one Red-spotted Newt were also incidentally captured via minnow traps in the east pond (Figure 31). Lands around the quarry will also support snakes, including the Maritime Garter Snake, Eastern Smooth Green Snake and Northern Redbelly Snake. Suitable habitat is not present at the site for species of conservation concern such as Wood Turtle or Snapping Turtle; and the range for Threatened Eastern Ribbon Snake is limited to an area further east—along the Mersey River drainage from approximately Milton, Queens County extending inland.



Figure 31. Red spotted newt (*left*) and American Bullfrog (*right*) observed in the east pond at the quarry, June 2 2022.

4.2.9 SPECIES AT RISK

Background: Species at Risk are plants or animals whose existence is threatened, or which are in danger of being threatened, by human activities or natural events. The Canadian Committee on the Status of Endangered Wildlife in Canada (COSEWIC) presently recommends species to be listed for legal federal protection under the federal *Species at Risk Act* (SARA). At the provincial level, the Nova Scotia Species at Risk Working Group completes assessments and recommendations for a species' status. Nova Scotia maintains a list of legally protected species under the *Nova Scotia Endangered Species Act* (ESA). A third status list is the *sub-national ranks* (S-ranks), which is a provincial system used for ranking species rarity or conservation status as a tool for identifying gaps in knowledge for species for which occurrence data are maintained. S-ranks are specific to a province and consider a variety of factors including number of occurrences, distribution, population size, abundance trends, and threats. Species listed as "S1" (any species known to be, or believed to be critically imperiled due to extreme rarity or steep declines), and "S2" (any species known to be, or believed to be, imperiled due to restricted ranges, few populations, or steep declines)

are considered priority species⁶. Species that may be at risk of extirpation or extinction are candidates for a detailed risk assessment by COSEWIC, or provincial or territorial equivalents. The Nova Scotia *Biodiversity Act* sets guidelines for activities in the vicinity of species at risk on Crown Land and also provides guidance for private land owners for working near these species.

Survey Results: The Atlantic Canada Conservation Data Centre (ACDC) maintains a database of records of species of conservation concern listed under federal or provincial legislation as well as with general status. Species of conservation concern in the database that occur within five kilometres of the Granite Village Quarry site include both animals and plants (Table 5). Two plant species having an S3 ranking (vulnerable status) or S3/S4 were encountered during the various field studies for this project. Several plants of Bicknell's Crane Bill (*Geranium bicknellii*) (S3) were observed in a highly disturbed area along a trail (skidder track) located adjacent to the two ponds northeast of the active quarry area; and a Sharp Fruit Rush (*Juncus acuminatus*) (S3/S4 ranking) was observed in marsh habitat near the larger of the two ponds northeast of the active quarry (Figure 22). Although only one clump of Sharp Fruit Rush was observed during the fall botany survey, it is considered likely that more plants are present within and adjacent to the general area of the two ponds. Long's Bulrush (*Scirpus longii*), an Atlantic Coastal Plain plant, is listed as special concern by COSEWIC and vulnerable by the Nova Scotia *Endangered Species Act* and has been reported within 4.5 kilometers of the study site in wetlands surrounding the Tidney River and its tributaries (ACDC 2022).

The mixed woodland and hardwood habitats within the study site potentially support many of the bird species of conservation concern from time to time. Federally listed bird species of conservation concern occurring within five kilometers of the study site include Piping Plover, Lesser Yellowlegs, Red-necked Phalarope, Common Nighthawk, Olive-sided Flycatcher, and Evening Grosbeak. Of the species listed, the Olive-sided Flycatcher (listed as threatened under the Federal *Species at Risk Act* and provincial *Endangered Species Act* and is listed as special concern by COSEWIC) is typically found in treed (black spruce) sphagnum bogs, which occurs at the study site, northeast of the two ponds. The Olive-sided Flycatcher has been observed 1.8 kilometers from the study site (ACDC 2022), although suitable habitat does not occur in the study area and the species was not encountered during the breeding bird survey. Common Nighthawk are found in open areas with little ground vegetation including logged or burned over areas, forest clearings, rocky outcrops and peat bogs, and potentially could occur at the site. Evening Grosbeak prefer open, mature, mixed wood forests where fir species or white spruce are dominant; Balsam Fir stands occur in the vicinity of the study site, but most areas proposed for the expansion contain mixed or hardwood stands. Evening Grosbeak were not found in the breeding bird survey, and have otherwise been observed approximately 4.5 kilometers from the study site (ACDC 2022). No federally or provincially listed bird species of conservation concern were observed during dedicated surveys at the study site in June 2022.

Among the bird species of concern occurring within five kilometers of the study area, the Piping Plover is listed federally and provincially as endangered. The Piping Plover has been recorded within 1.5 kilometers of the study site on beaches and tidal flats of the Port L'Hebert Migratory Bird Sanctuary (MBS) and are unlikely to be found at the study site (ACDC 2022). Other migratory bird species of conservation concern reported

⁶ Definitions of all S-Ranks are presented in Table 5.

as occurring within the Port L'Hebert MBS include Red-necked Phalarope, Lesser Yellowlegs, Common Nighthawk, Semipalmated Plover, Least Sandpiper, Sanderling, Willet, Greater Yellowlegs, Black-bellied Plover, Ruddy Turnstone, Semipalmated Plover, Short-billed Dowitcher and Spotted Sandpiper. These migratory birds are unlikely to occur within the study area. The site is in an Important Bird Area (IBA), set up to highlight coastal wildlife in the vicinity, and which extends 2.5 kilometers inland from the Atlantic Coast.

Other animals of conservation concern in this part of Nova Scotia includes Mainland Moose (listed provincially as endangered) which has been observed occurring within 2.3 kilometers of the study site; however, no moose or sign were seen during the June 2022 mammal survey (Appendix C). The combination of aquatic habitats with abundant browse, and areas with high mast production, may be attractive to Moose at specific times of year, and therefore, Moose may use this area to meet some of their seasonal life-history needs. Snapping turtle (listed as special concern by *COSEWIC* and *SARA*, and vulnerable by the *ESA*) have been documented as occurring within 10 kilometers of the study area although they are unlikely to occur in the study area because the wetlands are not large or productive enough to support them (ACDC 2022; Appendix C). The provincially endangered Monarch butterfly has been recorded in the area, 6.3 kilometers from the quarry and the Seaside Dragonlet (S3S4 ranking) has been observed at approximately 4.5 kilometers; however the preferred habitat types for these insects (open fields and meadows of wildflowers which support Common Milkweed; and saltmarsh habitats, respectively), do not occur within the study area (ACDC 2022). Although Canada Lynx and American Marten, which are both currently listed as "endangered" under the *NS Endangered Species Act*, have not been observed within 25 kilometers of the study site, these species are of concern due to low numbers and may occasionally occur. No sign of these species was found on the wildlife survey of the site (Appendix C).

The Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) (all federally and provincially listed as endangered) are species of concern potentially occurring within the area. Little Brown Myotis (listed as endangered by *COSEWIC*, *SARA*, and *ESA*) has been recorded within 8.5 kilometers of the study area, and the presence of mature trees and snags for roosting cover, as well as open water and bog wetland types for a source of aerial insects suggests the species could use the site during the year. Bats typically overwinter in abandoned mine shafts, natural caves, and old buildings, but no abandoned mines occur near the quarry, the closest being 13 kilometers (Nova Scotia 2021). Numbers of bats are exceedingly low in most areas of Nova Scotia due to the White-Nose Syndrome, and occurrences are extremely unlikely at the quarry site due to the low overall numbers. Nonetheless, there is a potential for bats to occur, and hibernacula may be present within 10 km of the study site (ACDC 2022). The nearest former mine in the literature which once was used by bats is at the Ovens Natural Park in Lunenburg (Moseley 2007); and caves serving as natural swarming sites are found typically in central Nova Scotia (Randall and Borders 2014). Natural caverns were not noted during the site reconnaissance, so the occurrence of a hibernaculum at the site is unlikely.

Vole Ears Lichen (also known as Graceful Felt Lichen) and Boreal Felt Lichen are both rare and endangered species of lichen in Nova Scotia and may occur in forested habitats in the Granite Village Quarry area. Both species of lichen are federally and provincially listed as endangered and have been observed within 1.1 kilometers (Boreal Felt Lichen) and 3.1 kilometers (Vole Ears Lichen) of the quarry site, and could potentially occur at the site (Table 5), but were not observed on the study site during the lichen or botany surveys. Vole Ears Lichen and Boreal Felt Lichen prefer cool, moist habitats, typically on north-facing slopes dominated by

Balsam Fir stands with sphagnum moss wetlands. A Blue Felt Lichen (listed as special concern under *SARA* and *COSEWIC*, and considered provincially vulnerable) was observed at the study site during a fall lichen survey on a Red Maple trunk, within the primarily marsh wetland associated with the two ponds located northeast of the active quarry (20 T 341668 E; 4860554 N)(Figure 22). Blue Felt Lichen grows typically in cool, moist habitats, and is often found on the trunks of old broad-leaved trees. Other lichen species of conservation concern reported as occurring within five kilometers of the study area include Wrinkled Shingle Lichen and Black Foam Lichen (both listed as threatened by *SARA*, *COSEWIC*, and *ESA*); Frosted Glass-Whiskers Lichen (listed as special concern by *COSEWIC* and *SARA*); and White-rimmed Shingle Lichen (listed as threatened under *COSEWIC*) (ACCDC 2022).

A list of plants and animals of concern within a 5, 10 and 100 kilometer radius of the study site is included in Appendix C.

Table 5. Records of species of concern within a five kilometer radius of Granite Village Quarry, Queens County, Atlantic Canada Conservation Data Centre (ACCDC) Database, March 2022.							
Family/Scientific Name	Common Name	Status/Rank					
		SARA	COSEWIC (NPROT ¹)	NS ESA (SPROT ²)	SUB-NATIONAL RARITY RANK (SRANK) ³	GLOBAL RARITY RANKING OF SPECIES (GRANK) ⁴	
FLORA							
Betulaceae	<i>Alnus serrulata</i>	Smooth Alder	-	-	-	S3	G5
Coccocarpiaceae	<i>Coccocarpia palmicola</i>	Salted Shell Lichen	-	-	-	S3S4	G5
Collemataceae	<i>Scytinium tenuissimum</i>	Birdnest Jellyskin Lichen	-	-	-	S2S3	GNR
	<i>Collema nigrescens</i>	Blistered Tarpaper Lichen	-	-	-	S3	G5
	<i>Scytinium subtile</i>	Appressed Jellyskin Lichen	-	-	-	S3S4	GNR
	<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen	-	-	-	S3	G5
	<i>Leptogium Corticola</i>	Blistered Jellyskin Lichen	-	-	-	S3S4	G4
	<i>Leptogium acadense</i>	Acadian Jellyskin Lichen	-	-	-	S3S4	GNR
Coniocybaceae	<i>Sclerophora peronella</i>	Frosted Glass-whiskers	Special Concern	Special Concern	-	S3S4	G3
Cyperaceae	<i>Scirpus longii</i>	Long's Bulrush	-	Special Concern	Vulnerable	S3	G3
Juncaginaceae	<i>Triglochin gaspensis</i>	Gasp Arrowgrass	-	-	-	S3S4	G4
Lobariaceae	<i>Sticta fuliginosa</i>	Peppered Moon Lichen	-	-	-	S3S4	G4
Orchidaceae	<i>Spiranthes casei var. novaescotiae</i>	Case's Ladies'-Tresses	-	-	-	S2S3	G4
	<i>Platanthera flava</i>	Southern Rein-Orchid	-	-	-	S3	G4
	<i>Liparis loeselii</i>	Loesel's Twayblade	-	-	-	S3S4	G5

Table 5. Records of species of concern within a five kilometer radius of Granite Village Quarry, Queens County, Atlantic Canada Conservation Data Centre (ACCDC) Database, March 2022.

Pannariaceae	<i>Erioderma mollissimum</i>	Graceful Felt Lichen (Vole Ears Lichen)	Endangered	Endangered	Endangered	S1	G4
	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen – Atlantic pop.	Endangered	Endangered	Endangered	S1	G2
	<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened	Threatened	Threatened	S2S3	G4
	<i>Fuscopannaria leucosticta</i>	White-rimmed Shingle Lichen	Threatened	-	-	S3	G4
	<i>Pectenaria plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	GNR
	<i>Moelleropsis nebulosa</i>	Blue-gray Moss Shingle Lichen	-	-	-	S2S3	GNR
	<i>Fuscopannaria ahlneri</i>	Corrugated Shingles Lichen	-	-	-	S3	G4
	<i>Parmeliella parvula</i>	Poor-man’s Shingles Lichen	-	-	-	S1S2	GNR
Parmeliaceae	<i>Anzia colpodetes</i>	Black-foam Lichen	Threatened	Threatened	Threatened	S2S3	G5
	<i>Parmotrema perlatum</i>	Powdered Ruffle Lichen	-	-	-	S3S4	G4
	<i>Pseudovernia cladonia</i>	Ghost Antler Lichen	-	Not At Risk	-	S2S3	G3
Physciaceae	<i>Heterodermia speciosa</i>	Powdered Fringe Lichen	-	-	-	S3S4	G5
	<i>Heterodermia neglecta</i>	Fringe Lichen	-	-	-	S3S4	GNR
Poaceae	<i>Piptatheropsis canadensis</i>	Canada Ricegrass	-	-	-	S3	G4
Umbilicariaceae	<i>Umbilicaria vellea</i>	Grizzled Rocktripe Lichen	-	-	-	S1	G5
ANIMALS-BIRDS							
Anatidae	<i>Histrionicus histrionicus</i> pop. 1	Harlequin Duck – Eastern population	Special Concern	Special Concern	Endangered	S2S3N, SUM	T4
Apodidae	<i>Chatetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2S3B,S1M	G4
Caprimulgidae	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Special Concern	Threatened	S3B	G5
Charadriidae	<i>Charadrius melodus melodus</i>	Piping Plover melodus subspecies	Endangered	Endangered	Endangered	S1B	T3
	<i>Charadrius semipalmatus</i>	Semipalmated plover	-	-	-	S1B,S4M	G5
	<i>Pluvialis squatarola</i>	Black-bellied Plover	-	-	-	S3M	G5
Fringilidae	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B,S3N,S3M	G5
Hirundinidae	<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Endangered	S2B	G5
	<i>Hirundo rustica</i>	Barn Swallow	Threatened	Special Concern	Endangered	S3B	G5

Table 5. Records of species of concern within a five kilometer radius of Granite Village Quarry, Queens County, Atlantic Canada Conservation Data Centre (ACDC) Database, March 2022.

Icteridae	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	Threatened	Vulnerable	S3B	G5
	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	G4
Libellulidae	<i>Erythrodiplax berenice</i>	Seaside Dragonlet	-	-	-	S3S4	G5
Parulidae	<i>Setophaga castanea</i>	Bay-breasted Warbler	-	-	-	S3S4B,S4S5M	G5
	<i>Cardellina canadensis</i>	Canada Warbler	Threatened	Special Concern	Endangered	S3B	G5
	<i>Setophaga tigrina</i>	Cape May Warbler	-	-	-	S3B, SUM	G5
Picidae	<i>Picoides arcticus</i>	Black-backed Woodpecker	-	-	-	S3S4	G5
Podicipedidae	<i>Podiceps auritus</i>	Horned Grebe	Special Concern	Special Concern	-	S3N, SUM	G5
Scolopacidae	<i>Tringa flavipes</i>	Lesser Yellowlegs	-	Threatened	-	S3M	G5
	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern	Special Concern	-	S2S3M	G4
	<i>Calidris minutilla</i>	Least Sandpiper	-	-	-	S1B,S4M	G5
	<i>Calidris alba</i>	Sanderling	-	-	-	S2N,S3M	G5
	<i>Tringa semipalmata</i>	Willet	-	-	-	S3B	G5
	<i>Tringa melanoleuca</i>	Greater Yellowlegs	-	-	-	S3B,S4M	G5
	<i>Arenaria interpres</i>	Ruddy Turnstone	-	-	-	S3M	G5
	<i>Calidris pusilla</i>	Semipalmated Sandpiper	-	-	-	S3M	G5
	<i>Limnodromus griseus</i>	Short-billed Dowitcher	-	-	-	S3M	G5
	<i>Actitis macularius</i>	Spotted sandpiper	-	-	-	S3S4B,S5M	G5
Tyrannidae	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Special Concern	Threatened	S3B	G4
Vireonidae	<i>Vireo gilvus</i>	Warbling Vireo	-	-	-	S1SB, SUM	G5
ANIMALS-OTHER							
Cervidae	<i>Alces alces americanus</i>	Moose	-	-	Endangered	S1	T5
Chelydridae	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	G5
Colubridae	<i>Thamnophis saurita</i>	Eastern Ribbonsnake	Threatened	Threatened	Threatened	S2S3	G5
Nymphalidae	<i>Danaus plexippus</i>	Monarch	Special Concern	Endangered	Endangered	S2?B,S3M	G4
Vespertilionidae	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	G3
	<i>Vespertilionidae sp.</i>	Bat Species	-	-	-	S1S2	

¹ NPROT, National conservation status of species, as designated by [COSEWIC](#).

Extinct (X) - A wildlife species that no longer exists.

Extirpated (XT) - A wildlife species that no longer exists in the wild in Canada but exists elsewhere.

Endangered (E) - A wildlife species facing imminent extirpation or extinction.

Threatened (T) - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Data Deficient (DD)- A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or

Table 5. Records of species of concern within a five kilometer radius of Granite Village Quarry, Queens County, Atlantic Canada Conservation Data Centre (ACDC) Database, March 2022.

(b) to permit an assessment of the wildlife species' risk of extinction.
Not at Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
² SPROT=Provincial Rank/Status of Taxon.
³ SRANK, Sub-National (Provincial) Rarity Ranks

S1	Extremely rare throughout its range in the province (typically 5 or fewer occurrences or very few remaining individuals). May be especially vulnerable to extirpation.
S2	Rare throughout its range in the province (6 to 20 occurrences or few remaining individuals). May be vulnerable to extirpation due to rarity or other factors.
S3	Uncommon throughout its range in the province, or found only in a restricted range, even if abundant in at some locations (21 to 100 occurrences).
S4	Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the Element is of long-term concern (e.g. watch list). (100+ occurrences).
S5	Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions.
S#S#	Numeric range rank: A range between two consecutive numeric ranks. Denotes range of uncertainty about the exact rarity of the Element (e.g., S1S2).
SH	Historical: Element occurred historically throughout its range in the province (with expectation that it may be rediscovered), perhaps having not been verified in the past 20 - 70 years (depending on the species) and suspected to be still extant.
SU	Unrankable: Possibly in peril throughout its range in the province, but status uncertain; need more information.
SX	Extinct/Extirpated: Element is believed to be extirpated within the province.
S?	Unranked: Element is not yet ranked.
SA	Accidental: Accidental or casual in the province (i.e., infrequent and far outside usual range). Includes species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded.
SE	Exotic: An exotic established in the province (e.g., Purple Loosestrife or Coltsfoot); may be native in nearby regions.
SE#	Exotic numeric: An exotic established in the province that has been assigned a numeric rank.
SP	Potential: Potential that Element occurs in the province, but no occurrences reported.
⁴ GRANK, Global rarity rank of species, using CDC/NatureServe methods	
G1	Critically Imperiled —At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
G2	Imperiled —At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
G3	Vulnerable —At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
G4	Apparently Secure —At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
G5	Secure —At very low risk of extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.
GU	Unrankable —Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible (when the range of uncertainty is three consecutive ranks or less), a range rank (e.g., G2G3) should be used to delineate the limits (range) of uncertainty.
GNR	Unranked —Global rank not yet assessed.
G#G#	Range Rank —A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).
Q	Questionable taxonomy that may reduce conservation priority —Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower-priority (numerically higher) conservation status rank. The “Q” modifier is only used at a global level and not at a national or subnational level.
C	Captive or Cultivated Only —Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The “C” modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to “Extinct” in the Wild (EW) in IUCN’s Red List terminology (IUCN 2001).
T	Intraspecific Taxon (trinomial)—The status of intraspecific taxa (subspecies or varieties) are indicated by a “T-rank” following the species’ global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species. For example, a G1T2 subrank should not occur. A vertebrate animal population, (e.g., listed under the U.S.

Table 5. Records of species of concern within a five kilometer radius of Granite Village Quarry, Queens County, Atlantic Canada Conservation Data Centre (ACDC) Database, March 2022.

	Endangered Species Act or assigned candidate status) may be tracked as an infraspecific taxon and given a T-rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.
SR	Reported: Element reported in the province but without persuasive documentation, which would provide a basis for either accepting or rejecting (e.g., misidentified specimen) the report.
SRF	Reported falsely: Element erroneously reported in the province and the error has persisted in the literature.
SZ	Zero occurrences: Not of practical conservation concern in the province, because there are no definable occurrences, although the species is native and appears regularly. An NZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations) or transitory. In other words, the migrant regularly passes through the province, but enduring, mappable Element Occurrences cannot be defined.

Table 6. Provincially listed species of concern with potential to occur in the vicinity of the project site (~10 kilometers). Nova Scotia Museum records (Nova Scotia Communities, Culture and Heritage 2022).

Scientific Name	Common Name	SARA	COSEWIC (NPROT ¹)	NS ESA (SPROT ²)	SUB-NATIONAL RARITY RANK (SRANK) ³	GLOBAL RARITY RANKING OF SPECIES (GRANK) ⁴
Other						
<i>Alnus serrulata</i>	Brook-side Alder	-	-	-	S3	G5
<i>Goodyera repens ophiodes</i>	Dwarf Rattlesnake-plantain	-	-	-	S3S4	G5
<i>Teucrium canadense</i>	American Germander	-	-	-	S4	G5
<i>Pectenia plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	G5
<i>Epigaea repens</i>	Trailing Arbutus	-	-	-	S5	G5
<i>Gaylussacia baccata</i>	Black Huckleberry	-	-	-	S5	G5
<i>Ilex verticillata</i>	Common Winterberry	-	-	-	S5	G5
<i>Schoenoplectus acutus</i>	Hardstem Bulrush	-	-	-	S4	G5
<i>Viburnum nudum cassinoides</i>	Northern Wild Raisin	-	-	-	S5	GNR

¹ NPROT, National conservation status of species, as designated by COSEWIC.

Extinct (X) – A wildlife species that no longer exists.

Extirpated (XT) - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.

Endangered (E) - A wildlife species facing imminent extirpation or extinction.

Threatened (T) - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Data Deficient (DD)- A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

² SPROT=Provincial Rank/status of taxon & Provincial GS Rank.

Table 6. Provincially listed species of concern with potential to occur in the vicinity of the project site (~10 kilometers). Nova Scotia Museum records (Nova Scotia Communities, Culture and Heritage 2022).						
Scientific Name	Common Name	SARA	COSEWIC (NPROT¹)	NS ESA (SPROT²)	SUB-NATIONAL RARITY RANK (SRANK)³	GLOBAL RARITY RANKING OF SPECIES (GRANK)⁴
³ SRANK, Sub-National (Provincial) Rarity Rank. ⁴ GRANK, Global rarity rank of species, using CDC/Nature Serve methods						

4.2.10 NATURAL AREAS & WILDERNESS

The Granite Village area where the quarry is located is a relatively remote and undeveloped location in Nova Scotia. Situated in Southwest Nova Scotia along the South Shore, the area has a relatively high proportion of wilderness and natural areas both inland and along its coast. Although settlement and consequent expansion and logging in the past changed the character of the landscape, much of the land has returned to forest in most areas; however logging activity is currently taking place in a recent stage of forest harvesting. A high proportion of Crown Land in the area has been devoted to protected and managed wildlife areas, leaving many natural and untouched areas, including Thomas Raddall Provincial Park and Port L’Hebert Provincial Park, as well as a number of nature reserves and migratory bird sanctuaries (refer to Figure 33). Three migratory bird sanctuaries designated under the federal *Migratory Birds Convention Act* –The Port Joli Migratory Bird Sanctuary (MBS), the Port l’Hebert MBS, and the Haley Lake MBS near Sable River are located at or near the heads of inlets in those areas, and support large numbers of migratory water birds, including Canada Geese, Black Duck and Green-Winged Teal (refer to Figure 33). Wild land allows preservation for wildlife, hunting and outdoor recreation which are important to locals and visitors to the area. People living in these areas are exposed to the natural environment day-to-day and appreciate the presence of, and access to, undeveloped land and nature, while accepting the usual activities needed to use the resources (e.g. aggregate quarries, forestry operations) on which many of them depend for their livelihood. Trails located nearby are also used by residents for activities such as ATV riding, and the quarry is used as a stopping point to admire the view of the nearby land available from the quarry (see Figure 3) (comment from a local community member, 2022).

Queens County is also one of five counties that make up the Southwest Nova Biosphere Reserve (SNBR) (Figure 32). The SNBR is a UNESCO designated and internationally recognized unique region of natural and cultural heritage. It encompasses both terrestrial and coastal ecosystems, promotes the conservation of biological diversity, and contributes to the maintenance of healthy ecosystems. A goal is to educate about natural systems and how they are changing as well as traditional forms of land use through knowledge sharing and collaborative management (SNBR 2020). The Granite Village Quarry is located within the SNBR, however, is not in any specific protected areas within the Biosphere Reserve.

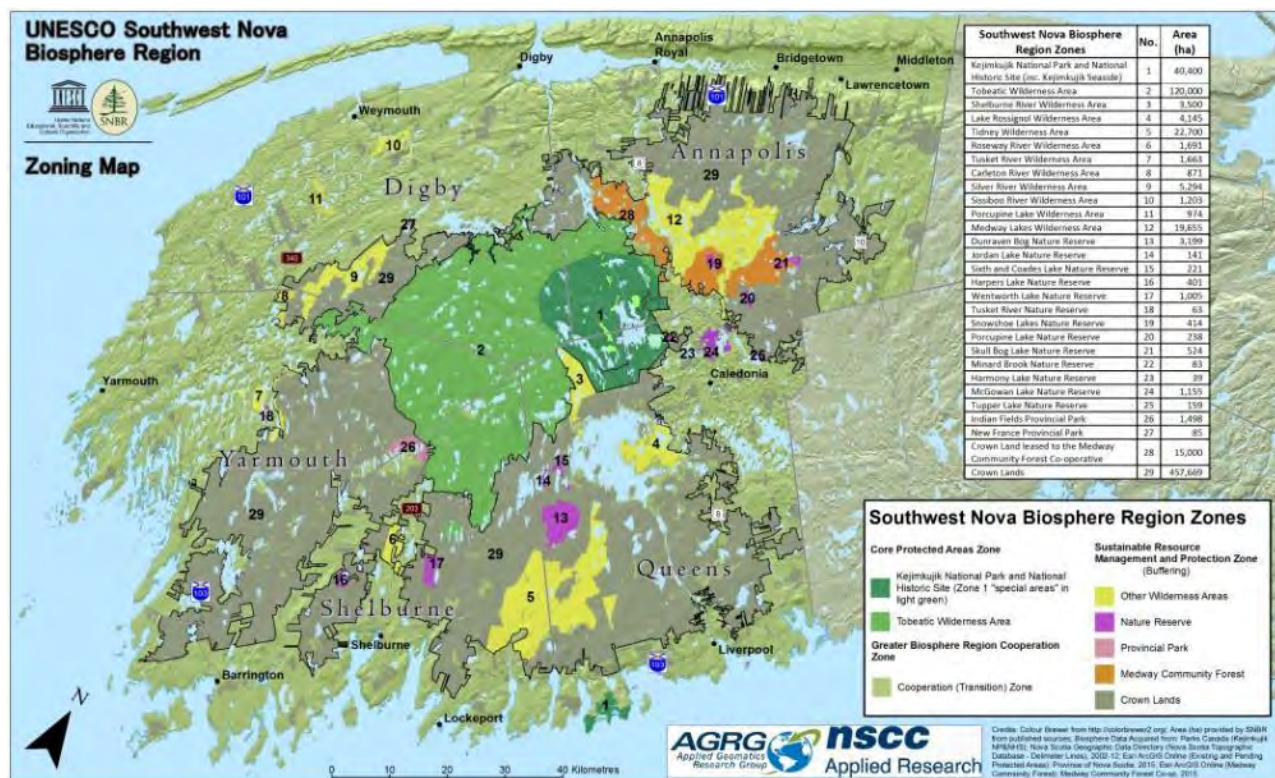


Figure 32. Southwest Nova UNESCO Biosphere Reserve (SNBR 2020).

4.3 HUMAN USES OF THE ENVIRONMENT

4.3.1 Mi'kmaq

The Mi'kmaq maintain aboriginal claim to all of the landmass of Nova Scotia, and the Province of Nova Scotia maintains a policy that proponents of industrial development projects engage with the Mi'kmaq concerning their activities. The nearest Mi'kmaq communities are Acadia First Nation and Bear River First Nation. Acadia First Nation includes the Southwestern Region of Nova Scotia, spanning five counties from Yarmouth to Halifax. The Yarmouth Reserve in Yarmouth County is considered the hub of Acadia First Nation and is located approximately 90 kilometers west of the study site, while the nearest communities are in Queens County. The Ponhook Lake Reserve No. 10 is approximately 32 kilometers north of the Granite Village Quarry and is the closest reserve to the study area. Medway River Reserve No. 11 and Wildcat Reserve No. 12 are approximately 45 kilometers northeast and 53 kilometers north of the study site, respectively. In addition to the five separate reserves, Acadia First Nation has two separate land holdings, including one in the Town of Shelburne, where many Band members live off reserve. Bear River First Nation is located in Digby County and is situated approximately 90 kilometers northwest of the study site. Among various community activities and pastimes are hunting and fishing, and harvesting wild foods for sustenance and traditional ceremonial activities.

Granite Village Quarry is in what was once was the Mi'kmaw territory known as *Kespukwitk*, meaning 'end of flow' or 'Lands End', and traditional place names near the study area include *Apsipukwejk* /*Apsipukwe'ji'jk*,

meaning ‘at the small river’ (currently known as Port L’Hebert/Tidney River); *Pemsik / Sa’msn Wteleke’wa’kim* translating to ‘blowing along/ Samson’s kingdom’ (currently known as Port Joli); and *Nisiamk/ Pijipukwek*, meaning ‘flowing down over sand’ (currently known as Sable River) (CRM 2022). These traditional Mi’kmaq place names reflect resources available and landscape features in the area. The study area is located at the head of the Port L’Hebert inlet which would have provided a sheltered harbour important for transportation and resource gathering and would have attracted Pre-contact occupation. Port Joli, located southeast of the study area, contains the densest concentrations of Pre-contact shell midden sites in the Maritime Provinces (Betts 2009, cited in CRM 2022)[a shell midden is a concentration of mollusc shells of pre-contact age].

There are no registered Mi’kmaq archaeological sites within the study area perimeter, however two registered archaeological sites have been identified within two kilometers of the study site: County-Line Brook (AIDf-16) and Sutherland (ADIf-17). These sites are small, shallow, probably Pre-contact camp sites at the mouth of the County-Line Brook in Granite Village and the head of Port L’Hebert (CRM 2022). In addition to these sites, 35 registered archaeological sites are located within 10 kilometers of the study area, predominantly within or near the boundaries of Thomas Raddall Provincial Park (CRM 2022). Traditional fishing and hunting likely continues in the general area and off the coast.

In current times, two tribal councils exist in Nova Scotia: The Confederacy of Mainland Mi’kmaq (CMM) and Union of Nova Scotia Indians (UNSI). CMM is a not-for-profit organization incorporated in 1986, whose mission is to promote and assist Mi’kmaq communities. The UNSI, created in 1969, was formed *to provide a cohesive political voice for Mi’kmaq people*. The Native Council of Nova Scotia (NCNS) represents Mi’kmaq living off reserve. The NCNS is a self-governing agency located in Truro. The Office of N’Lu Affairs (formerly Office of Aboriginal Affairs) in Nova Scotia estimates that approximately 35% of Mi’kmaq live off reserve. The goal of NCNS is “to operate and administer a strong and effective Aboriginal Peoples Representative Organization that serves, advocates and represents our community.”

The Mi’kmaq Rights Initiative (Kwilmu’kw Maw-klusuaq; KMK) also represent a number of the First Nations in Nova Scotia. The mission of KMK—whose name means, “we are seeking consensus”— is “to address the historic and current imbalances in the relationship between Mi’kmaq and non-Mi’kmaq people in Nova Scotia and secure the basis for an improved quality of Mi’kmaq life.” KMK’s objective is to negotiate between the Mi’kmaq of Nova Scotia whom it represents, the Province and the Government of Canada, and operates from its main office in Millbrook. The Atlantic First Nations Environmental Network (AFNEN) is an environmental organization of Mi’kmaq communities and organizations. The CMM and UNSI are members of the AFNEN, with the Mi’kmaq Confederacy of PEI in Charlottetown currently the acting coordinator. The AFNEN includes a representative from each Mi’kmaq organization and community interested in environmental issues. The Network meets regularly during the year through meetings, conferences, and the Internet to discuss environmental matters or concerns. Two First Nations—Millbrook First Nation, and Sipekne’katik (Indian Brook) operate independently of these organizations. Millbrook is situated outside Truro and includes activities in Cole Harbour, Sheet Harbour, and Beaver Dam. Sipekne’katik First Nation is one of 13 First Nations and is the second largest Mi’kmaq band in Nova Scotia. Sipekne’katik First Nation includes the communities of Indian Brook, New Ross, Pennal, Dodd’s Lot, Wallace Hills and Grand Lake.

4.3.2 POPULATION AND ECONOMY

The Granite Village Quarry is located in the Region of Queens Municipality, the municipal unit occupying the majority of Queens County. The Region of Queens had a population of approximately 10,422 in 2021, one that has been slowly increasing—overall 1.2% positive population percentage change since 2016 when the population was approximately 10,302 (Statistics Canada 2022). Three First Nations reserves occupy the remaining census subdivisions within Queens County (Medway River 11, Ponhook Lake 10, and Wildcat 10) and collectively had a population of 79 in 2021 (Statistics Canada 2022).

Although the Granite Village Quarry is in Queens County, it is less than one kilometer from the border of Shelburne County, and shares aspects of the economy and population trends. Local economies in Queens and Shelburne County are tied primarily to fishing and forestry, and their communities face some of the same challenges as elsewhere in Nova Scotia, including lack of economic growth and an aging population (NSDMA 2019). Forestry is a common occupation inland, and has been for generations, employing Queens County locals in resource harvesting, lumber production and sawmills, and in the trucking industry. Lobster fishing dominates the marine fishing industry in both Queens and Shelburne Counties, providing employment opportunities through year-round harvesting, processing and exporting of the species. Manufacturing, and shipbuilding and repair facilities also support the fishing industry in these areas. As of 2018, Shelburne County accounted for almost half of all aquaculture production in the province with approximately 101 full- and part-time employees; however, aquaculture has a limited presence in the waters off Queens County. Licensed seafood buyers in Shelburne County recorded the highest value of seafood purchases in 2017 with \$230,315,328 for a total of 24,248,322 kg of seafood of all species (Johnson 2018). Health care and social assistance is also a significant sector in both Queens and Shelburne County providing important sources of income. The annual median family income of the Region of Queens \$56, 800 and the Municipality and District of Shelburne is \$62, 000—both lower than the median of Nova Scotia (\$71, 500) (Statistics Canada 2022).

4.3.3 WATER SUPPLY AND RESIDENTIAL WELLS

Drinking water for Queens County and Shelburne County is supplied by both public and private water systems. In Queens County, the municipality operates a water utility centre to distribute water to over 1,000 households and businesses in the county in urban areas near and in Liverpool. Water is drawn from Town Lake in Milton and treated at South Queens Water Treatment Facility. The facility has the capacity to produce nearly 1,500 gallons of water every minute (Region of Queens Municipality 2022). There are two wastewater treatment facilities located within and by the Queens Municipality. The South Queens Waste Treatment Facility was constructed in 2000 and has the capacity to treat 3.2 million gallons of sewage daily. The second facility has been in operation since 1997 in Caledonia (Region of Queens Municipality 2022). In Shelburne County, public water supplies come from surface water sources originally developed to supply fish plants in the area (Drage et al. 2016).

Both drilled and dug wells are used as drinking water sources in Queens County, however drilled wells are used as a secondary drinking water source. There are no groundwater supply wells the immediate vicinity of the study area. The nearest groundwater well in Queens County is over three kilometers away from the study site along Highway 103. In Shelburne County, the majority of residents rely on private wells and the nearest groundwater well to the study site in Shelburne County lies over seven kilometers from the study site along Highway 103 (Drage et al. 2016).

4.3.4 LAND USE

Land in the vicinity of the quarry is predominantly wilderness and undeveloped forest land with no residential use of the area in the immediate vicinity of the study site. There is a forestry presence in the area, and the logging road used for quarry access, and accessory roads, have been used, and are currently used for logging. The Woodland Multi-use Trail is located at the end of this unnamed quarry access road, and is used by many locals year-round for activities such as ATV and snowmobiling (local community member, personal communications, 2022). This trail follows the abandoned CN railway route to the west around the north side of Wilken’s Lake to Sable River and beyond. There are multiple parks and protected areas within the general vicinity of the study site, the closest of which being Port L’Hebert Nature Reserve located 3.5 kilometers from the study site.

4.3.5 AQUACULTURE AND SHELLFISH HARVESTING

Aquaculture has a limited presence in the waters off the coast of Queens County. There are two issued, commercial marine finfish locations in Queens County for a variety of salmon (Atlantic Salmon and Steelhead Salmon) and Brook Trout. The nearest aquaculture site is located 8.3 kilometers from the study site and has been in operation since 2020 off the coast of Port Mouton. A second marine finfish aquaculture site is located in Liverpool Bay, and in addition, a number of commercial marine finfish sites are proposed. One land-based aquaculture facility in Queens County cultivates Tilapia and Koi, located in the community of Brooklyn approximately 30 kilometers from the study area (NSDFA 2022). No shellfish aquaculture occurs off the coast of Queens or Shelburne Counties. There are nine marine finfish facilities and three land based facilities located in Shelburne County. Shellfish harvesting is prohibited in the immediate waters adjacent to the Port L’Hebert Migratory Bird Sanctuary but is permitted elsewhere in nearby areas along the Atlantic Coast.

4.3.6 HUNTING AND TRAPPING

Lands in the vicinity of the Granite Village Quarry site support many of the common game and fur-bearing species characteristic of Nova Scotia in general. Hunting or trapping activity may take place in the general vicinity of the site, although trapping statistics indicate that Queens County has an intermediate harvest of most species. White-tailed deer are common with significant habitat for deer wintering located in the general vicinity, although the county typically ranks among the lowest for deer harvest, as it does for Black Bear, in Nova Scotia. The main furbearers trapped in the five-year period (2016 to 2021) were Raccoon, Eastern Coyote and beaver. No American Marten or Canadian Lynx were trapped within the county in the last five years. Snowshoe Hare are the most commonly hunted upland game in Queens County (Table 7).

Animal	Queens County Reported Harvest	Provincial Reported Harvest	Percent (%) of total for province
LARGE MAMMALS			
Deer (Zone 103)	4,437	35,671	12.44%
Bear	99	2,111	4.69%
UPLAND GAME			

Snowshoe Hare	13,295	203,354	6.54%
Ruffed Grouse	7,515	116,392	6.46%
Ring-necked Pheasant	0	12,772	0.00%
FUR HARVEST			
Beaver	374	8,903	4.20%
Muskrat	63	20,501	0.31%
Otter	38	1,316	3.57%
Mink	35	2,669	1.31%
Bobcat	177	3,710	4.77%
Fox	20	1,499	1.33%
Raccoon	191	4,307	4.43%
Skunk	1	158	0.63%
Squirrel	70	1,554	4.50%
Weasel	95	665	14.29%
Coyote	251	10,538	2.38%
Canadian Lynx*	0	20	0.00%
American Marten*	0	12	0.00%
Fisher	27	584	4.62%
Total Furbearers	1,342	56,436	2.38%
*Trapped incidentally. Trappers Association of Nova Scotia prepares incidental pelts for auction and all proceeds go to the NS Species at Risk Conservation Fund.			

4.3.7 FORESTRY & AGRICULTURE

Forestry and agriculture contribute to the economy of Queens County, but the influence is relatively small compared with the rest of Nova Scotia. The forest industry has been an historically important industry in Queens County due to the availability of accessible forested land (Region of Queens Municipality 2022). Forest and wood production today employs locals in various segments of the industry, including resource harvesting, lumber production sawmills, biomass production, and trucking. A review of harvest volumes by county shows a relatively consistent volume of non-industrial, private harvesting has occurred in Queens County; however, there was a decline in volume from 2006 to 2009, but a strong recovery (Williams 2018). Both logging of natural stands and plantations are found in the general vicinity of the quarry (Map A-3).

Agriculture is not a prominent activity in the general vicinity of the site and adjacent coastal areas. It is more important in inland areas of the Municipality and currently a wide range of agricultural operations take place in Queens County. These include dairy farms, a hydroponic cannabis producer, a blueberry grower and processor, greenhouse and market garden operation, Christmas trees, seaweed compost producer, beef producer, mixed livestock producer, several smaller scale growers, egg producers, and livestock producers. In addition to the primary producers, there are value-added enterprises including baked products, jams and jellies, honey, processed meat, brewery, and non-timber forest products (such as mushrooms, berries, wreaths) within the County. Farming is a small but significant activity in relation to Provincial levels. In 2011, there were 37 farms in the County, making up less than one percent of the province total. A large proportion of farms in Queens County (37.8%) are involved in greenhouse, nursery and floriculture production. Queens County farms reported farm receipts of \$1.13 million in 2011, making up 0.19% of total provincial receipts.

Farms in the County are operating at a deficit of \$0.03 million as operating expenses are reported at \$1.16 million (NSFA 2017). The low interest in agriculture in the area partly stems from geographical limitations due to the nutrient poor, stony soil and poor drainage. Other reasons include climate, focus on other industries, as well as a small agri-tourism sector compared to those found in other provinces. Other types of agricultural activity in Queens County—including hog, pig, poultry, sheep, grain, and vegetable farming—fall below the provincial average largely due to terrain and lack of agricultural land required for these activities, although in the early days of settlement, local agriculture had a more important presence (Region of Queens Municipality 2022). No agricultural lands currently being used for agricultural production in Queens County are located near the study site (Region of Queens Municipality 2022).

4.3.8 RECREATIONAL, COMMERCIAL, AND MI'KMAQ FISHING

Historically, Queens County has supported fisheries lobster, scallops, and groundfish. In the 2020-2021 fishing season, 680 fishing licences were held for lobster fishing from Halifax to Shelburne County (LFA 33) (DFO 2022). Fishing effort in this area is controlled with restrictions on the number of licenses, number of traps per licence, season length, Minimum Legal Size (MLS) and non-retention of berried females (Cook et al. 2020; DFO 2022). Captain Little Seafood Ltd, operates fish processing plant in Port Mouton, Nova Scotia, approximately 11 kilometers from the study site. Captain Little Seafood Ltd is also the nearest wholesale distributor of seafood products and includes lobster, Atlantic sea cucumber, snow crab, scallops, salmon caviar, herring, Jonah crab, capelin fish, whelk, red sea cucumber, cold water shrimp and tuna (Captain Little Seafood Ltd. 2016).

The Confederacy of Mainland Mi'kmaq (CMM) represents eight Mi'kmaw communities in Nova Scotia, including Acadia First Nation and Bear River, the two communities located closest to the study site. CMM has a branch called the Mi'kmaw Conservation Group, which focuses specifically on the conservation of aquatic environments that have historic ties to Mi'kmaw communities. Multiple different species have been harvested by Mi'kmaq people for many years.

Recreational fishing provides an important resource and pastime for residents and visitors to Queens County and marine fisheries are the mainstay of coastal communities. The study area itself is not particularly important for freshwater recreational fishing but rivers and lakes in the area including Wilkins Lake, Mitchell Brook, Louis Lake, and Path Lake in Queens County; and Granite Village Brook and Tidney River in Shelburne County are fished recreationally during the freshwater fishing season of April 1 and September 30. Commonly fished freshwater species in Queens County include trout (speckled, rainbow and brown), white and yellow perch, landlocked salmon, smallmouth bass and chain pickerel. Smallmouth bass fishing is among the most popular fishing in accessible lakes in Queens County with a number of fishing tournaments hosted regularly through the summer months. Fishing recreationally for Chain Pickerel [an invasive predator species] year-round is also popular in Lake Louis near Port Joli (Region of Queens Municipality 2022). Mi'kmaq residing in the area likely use the recreational fishing resource as well. Other streams in the area are either too small, are not accessible, or have too steep a gradient to promote fishing.

4.3.9 HISTORICAL, ARCHAEOLOGICAL AND PALAEOONTOLOGICAL RESOURCES

The study area is part of the greater Mi'kmaw territory known as *Kespukwitk* (CRM 2022). Mi'kmaq originally occupied the area and virtually all waterbodies of Mi'kma'ki, both marine and freshwater, and their shores

until the colonization of European settlers. The original French name for the area was Port Aux Oars, or Port of Bears, eventually changing to Port Hebert, possibly after Louis Hebert, known as the first apothecary to reach Nova Scotia, and who overwintered on an island in the Liverpool area in 1604 *en route* to Port Royal. Granite Village was named for the abundance of large granite boulders (glacial erratics) in the area and historically this area this part of Nova Scotia is known for its long-standing forestry industry—established well before 1903.

Permanent European settlement of Port L’Hebert occurred shortly after the American Revolution when Loyalists came to the area (CRM 2022). The study area was originally part of three lots granted to Duncan McLean, Colin Mitchel, and Donald Cutt, former soldiers of the British Legion, in 1785. By 1882, Granite Village consisted of houses, a barn, mill and shipyard, although no structures or roads were constructed within or near the study site at the time. In 1891, the properties were sold as new families moved to the area; however only three cottages were seasonally occupied in the area by the 1960’s (CRM 2022).

The Archaeology Resource Impact Assessment for the site concluded that the expansion site for the Quarry exhibits low potential for encountering either Mi’kmaq (both Pre-contact and historic) and/or Euro-Canadian or African-Nova Scotian archaeological resources based on moderately to steeped slopes with shallow soils and numerous large erratics (CRM 2022). The study area itself is relatively distant from significant sources of water and historic roadways and contained no evidence of occupation (CRM 2022).

4.3.10 PARKS AND PROTECTED AREAS

Both the Province of Nova Scotia and the Government of Canada, as well as private conservation organizations, actively protect natural environments in the general vicinity of the site, and there are a relatively large number of parks and protected areas near the Granite Village Quarry (Figure 33). These include: two wilderness areas, five nature reserves, two conservation lands, one Important Bird Area (IBA), several migratory or other bird sanctuaries, one national park (the Kejimikujik Seaside Adjunct), and seven Provincial parks (Figure 33) (Nova Scotia Environment 2021). Port L’Hebert Provincial Park which contains the Port L’Hebert Pocket Wilderness and Trail, is the closest feature, located between Highway 103 and the Atlantic Coast at the quarry. The closest component property of the Provincial Port L’Hebert Nature Reserve—a cluster of protected areas in the vicinity—is located approximately 3.5 kilometers southwest. Parks and protected areas in the general area are listed in Table 8, and include:

Wilderness Areas are provincially-significant areas that protect representative examples of natural landscapes, native biological diversity, and outstanding natural features of Nova Scotia. They are used for scientific research, education and a variety of recreation and nature-tourism related activities such as hiking, canoeing, sea-kayaking, sport-fishing and hunting. These areas are designated under Nova Scotia’s *Wilderness Areas Protection Act*.

Nova Scotia Nature Trust’s Conservation Lands are protected areas that are safeguarded and stewarded for the purposes of nature conservation. The properties have come under the care of the Nature Trust through donation, part-donation, purchase, or conservation easement, and protect Nova Scotia’s rare, outstanding and unique natural areas while fulfilling landowner wishes to permanently protect the natural legacy that so many of them have proudly stewarded for generations.

Nova Scotia Nature Reserves are established to preserve and protect areas representative of natural ecosystems and associated plant and animal species. Scientific research and education are the primary uses of nature reserves and recreation is generally restricted. These areas are protected under the *Special Places Protection Act*.

Provincial Parks protect provincially or regionally significant natural heritage values such as coastlines and beaches, scenic views, diverse landscapes, forests, and lakes and rivers, for recreational use and general enjoyment by residents and tourists. Provincial Parks are important in conserving biodiversity as well as contributing to a high quality nature experience for users of the parks and economic development for nearby communities. Provincial Parks are established under the *Provincial Parks Act*.

National Parks are protected areas that are used to protect nationally significant heritage values, including forests, lakes, rivers, scenic views, etc. National parks are used for recreational purposes, provide opportunity for economic development for communities, and are important to the conservation of biodiversity. National Parks are protected under the *Canada National Parks Act*.

Important Birdlife and Biodiversity Areas Program Canada (IBA's) are discrete sites that support specific groups of birds: threatened birds, large groups of birds, and birds restricted by range or by habitat. IBA is a joint project of Bird Studies Canada and Nature Canada coordinated by BirdLife International.

Migratory Bird Sanctuaries (MBSs) support significant abundances or key species of migratory birds, and are designated under regulations under the federal *Migratory Birds Convention Act*.

Significant Habitat in Nova Scotia include sites where species at risk or other species of conservation concern can be found, sites where usually large concentrations of wildlife occur and habitats that are rare in the province of Nova Scotia. The Department of Natural Resources and Renewables collects information and data supplied by department staff, government departments and members of the public to create a database to help make people aware of these habitats to ensure the conservation of vulnerable wildlife species.

Table 8. Parks and protected areas within a 20 kilometer radius of Granite Village Quarry in Queens and Shelburne Counties. Province of Nova Scotia, Nova Scotia Environment Database, 2021.

Name of Site	Primary Type of Protection	Protection Status	Area (ha)
Carters Beach Provincial Park	Provincial Park	Pending Designation	96
Dunraven Bog Nature Reserve	Nature Reserve	Designated (2016)	3,464
Haley Lake Bird Sanctuary	Bird Sanctuary	Designated (1980)	100
Kejimkujik Seaside Adjunct National Park (Kejimkujik National Park Seaside)	National Park	Designated (1998)	2,001
Louis Head Provincial Park	Provincial Park	Pending Designation	7
Northwest Brook Nature Reserve	Nature Reserve	Designated (2016)	271
Northwest Brook Nature Reserve	Nature Reserve	Designated (2015) (Subject to Mineral Interests)	130
Peppered Moon Nature Reserve	Nature Reserve	Designated (2020)	164
Port Joli Conservation Lands	Land Trust Property	Considered Protected	614

Name of Site	Primary Type of Protection	Protection Status	Area (ha)
Port Joli Migratory Bird Sanctuary	Migratory Bird Sanctuary	Designated (1941)	280
Port L'Hebert Migratory Bird Sanctuary	Migratory Bird Sanctuary	Designated (1941)	350
Port L'Hebert Nature Reserve	Nature Reserve	Designated (2016)	691
Port L'Hebert Provincial Park	Provincial Park	Pending Designation	71
Sable River Provincial Park	Provincial Park	Designated	54
South Shore (Port Joli Sector) IBA	Important Bird Area	--	43,552
Summerville Beach Protected Park	Provincial Park	Designated	34
Thomas Raddall Provincial Park	Provincial Park	Designated (1997)	615
Thomas Raddall Provincial Park	Provincial Park	Expansion (2014)	170
Tidney River Conservation Lands	Land Trust Property	Considered Protected (2003)	947
Tidney River Wilderness Area	Wilderness Area	Designated (1998)	17,790
Tidney River Wilderness Area	Wilderness Area	Designated (2015) (Subject to Mineral Interests)	113

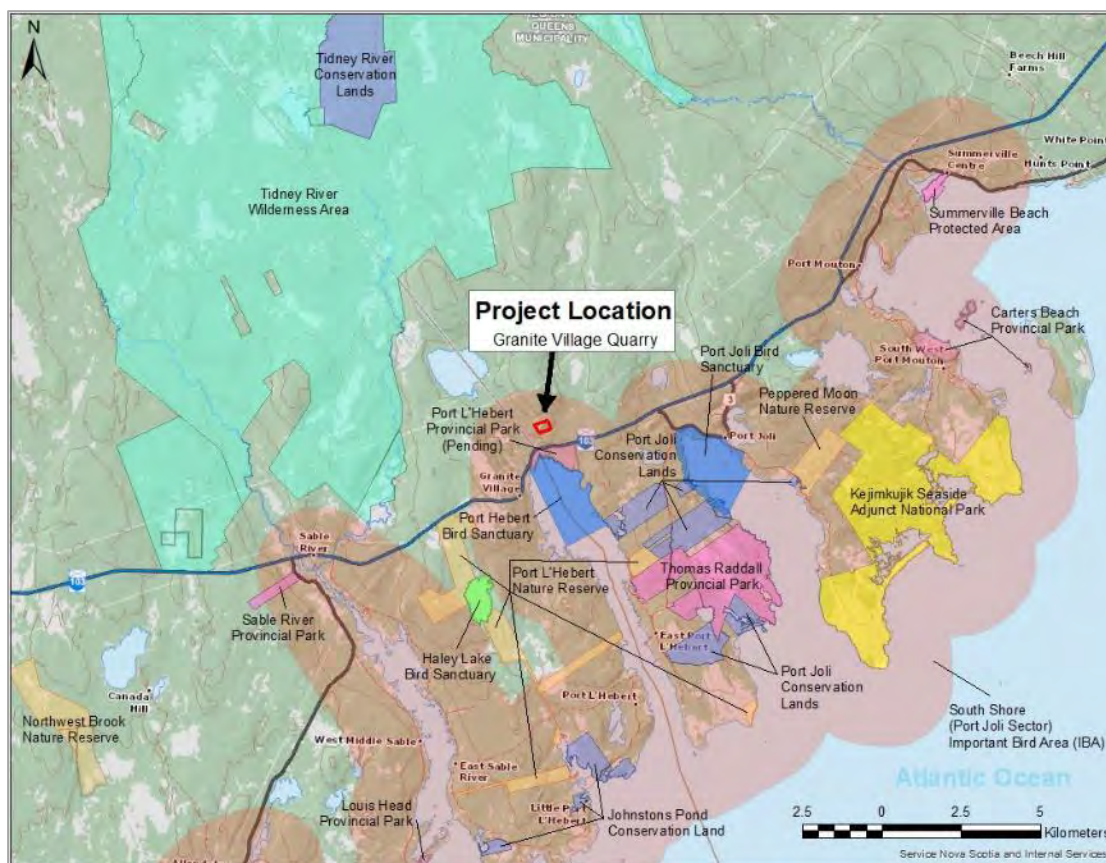


Figure 33. Parks and protected areas in the general vicinity of the Granite Village Quarry. Shading shows the extent of the South Shore Important Bird Area.

4.3.11 RECREATIONAL/CULTURAL FEATURES

Residents and visitors to Queens County access natural areas for a wide range of outdoor recreation activities. In the Port Joli to Sable River area, which brackets the quarry site, the predominant outdoor recreational activities are sightseeing, walking/hiking, birding, beachcombing, camping, boating (i.e., kayaking and canoeing), hunting, ATV and snowmobiling and angling. The Woodland Multi-Use Trail is an ATV trail on the abandoned Canadian National Railways rail bed north of the Granite Village Quarry, beginning and accessed from the logging road / quarry access road. The trail, which runs north of Wilkins Lake towards the community of Sable River and beyond, is maintained by the Woodland Multi-Use Trail Association. Port L'Hebert Provincial Park offers opportunities for ocean views and has viewing platforms for migratory birds. Thomas Raddall Provincial Park, offers scenic hiking trails that lead to the coast, beach access and camping, and views of the migratory bird sanctuary there. The Kejimikujik National Park Seaside Adjunct, located off Highway 103 near the community of Port Joli, is also a popular hiking destination along the Atlantic coastline.

4.3.12 RESIDENTIAL USE

The area between Port Mouton and Sable River is rural, with no large population centres and typically with homes spread along highways and in small subdivisions. There are no residences in the immediate vicinity of the Granite Village Quarry, and the nearest residences are in the small community of East Port L'Hebert, located near the entrance to Port l'Hebert inlet, and Port Joli, about 7.5 kilometers and 6.3 kilometers distant, respectively. Some residents occupy the area seasonally; while other permanent residents are in trades or fishers. East Side Port l'Hebert has a recently-upgraded DFO Small Craft Harbours wharf managed by a local harbour authority. Residents use the area for a variety of purposes including gardening, harvesting wild foods, hiking, hunting and fishing, ATV, and snowmobile use year round. Lot sizes in the area are large and may include surrounding tracts of forested land. Lifestyles of the residents of the general area tend towards retirees maintaining their homes and properties, residents working locally, seasonal cottage homes and younger individuals engaged in economic activities such as fishing in the area. As in other forested parts of rural Nova Scotia near the ocean, residents use the area and backcountry for recreation such as walking or hiking, canoeing or kayaking, and use ATVs and snowmobiles, as well as for access to natural resources (e.g. firewood). The quarry is 6.3 kilometers of the community of Port Joli, and approximately eight kilometers from the community of Sable River where residents can access various local services as well as recreational amenities such as walking trails and local businesses.

4.3.13 COMMERCIAL/INDUSTRIAL DEVELOPMENT

No businesses are located in the immediate vicinity of the study area, but logging occurs on private properties and Crown Land in the vicinity. The nearest business east of the quarry along Highway 103 is in the Village of Port Mouton and the community of Sable River, and centres on fishing (i.e., Sable River Fishing Supplies, Captain Little Seafood Ltd. and RBN Fisheries Ltd.); and tourism, including rental cottages and restaurants. Commercial activity occurs in the nearby community of Port Joli includes campsites, cottages and tourism shops (i.e., Little Robertson Campsite, Harbour Breeze Cottages and Rossignol Surf shop) focused on both locals and visitors to the many parks and protected areas (e.g. Port L'Hebert Provincial Park, Thomas Raddall Provincial Park and Kejimikujik National Park Seaside Adjunct, making tourism a growing industry in the immediate vicinity of the study area.

4.3.14 TOURISM AND VIEWSCAPE

Tourism in the vicinity of Granite Village is primarily focused on outdoor recreational activities, including angling, birding, camping, hiking, paddling and boating, surfing and ATV and snowmobiling. The area has a number of provincial parks and protected areas including Port L'Hebert Provincial Park, Kejimikujik National Park Seaside Adjunct, and Thomas Raddall Provincial Park that offer opportunities for camping and feature a variety of trails along the coast that are ideal for hiking, cross-country skiing and snowshoeing. The parks border Migratory Bird Sanctuaries (MBSs) (Port L'Hebert MBS and Port Joli MBS) and offer opportunities for observation of a diversity of bird species along the coastal salt marshes and beaches, including the endangered Piping Plover. The Thomas Raddall Provincial Park campgrounds offer multiple unserviced and walk-in campsites. It also includes beach access, where tourists can swim, canoe, kayak, surf and beachcomb. The Park is also the location of one of fifteen geocaching locations in Nova Scotia (Parks Nova Scotia 2016).

The Granite Village Quarry is briefly visible from several locations for eastward-travelling traffic along Highway 103, and activities and lights if the quarry operates night may also be visible (Figure 34).



Figure 34. Entrance to the Granite Village Quarry (also known as Port Joli Quarry) along Highway 103, facing northwest, June 2, 2022.

4.3.15 TRANSPORTATION

Highway 103 is the main 100-series highway linking the Halifax area with southwest Nova Scotia and Yarmouth. Several logging and access roads join the highway in the vicinity of the Quarry, although the number is not large, including the quarry access road to the north, and side roads which lead to parks and

protected areas on the south side. The Quarry access road is used periodically when the quarry is operating and when logging is taking place, as observed during the spring of 2022 when logging trucks were seen and heard passing the quarry. Highway 103 has comparatively high levels of both local and regional residential, commercial (fish products, logs and aggregate), and tourist traffic. Average daily traffic ranges from 1,209 to 2,873 vehicles per day (annual average of 990 to 2,430 vehicles per day) travelling between the town of Port Joli (Exit 22) and the Queens and Shelburne County line, over the 2006 to 2021 period, with peak average daily traffic at 2,873 vehicles per day in July 2021 (Nova Scotia Open Data Portal 2022). The percentage of trucks on Highway 103 was between 9-10% in 2006 (Nova Scotia Open Data Portal 2022).

When operating, the Granite Village Quarry contributes truck traffic and some heavy equipment traffic (e.g., trucks, crushers, asphalt trucks, etc.) in the vicinity of the site, typically in the summer and fall construction seasons. All equipment leaving the quarry, and production equipment moved to the Granite Village Quarry, must pass along on to Highway 103. Access to the quarry from Highway 103 is unobstructed with good sight lines and is not expected to be hazardous.

5 ENVIRONMENTAL IMPACTS, SIGNIFICANCE, AND MITIGATION

5.1 ASSESSMENT APPROACH AND METHODS

Information for the assessment was obtained from consultants' personal knowledge, from reviews of available information, and knowledge of the purpose and proposed design of the project. The environmental assessment follows *Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia* (NSE September 2009) and uses assessment methodology typical for environmental assessment screenings of this kind. For this assessment a list of valued environmental components (VECs)⁷ (also known as VCs)⁸, and project activities and outcomes for the proposed expansion of the existing quarry were developed, and the potential for interactions of these activities with VECs was identified. Where interactions were identified, and there was potential for significant impacts if mitigation was not undertaken, mitigating actions or activities have been suggested that will avoid the impact or reduce it to acceptable levels before the project proceeds. The process ensures that potentially significant impacts on VECs are identified and potential impacts on them have been considered, and sufficient mitigation planned.

⁷ Valued Environmental Components (VECs) are features or things in the environment, which are particularly important either ecologically, socially, economically or culturally. The environmental assessment addresses potential interactions of the project with each VEC identified and assesses potential impacts. The process followed involves identifying all the activities or outcomes of the project, which interact with each VEC, and then determining and rating the magnitude of the impact in a standard way, in this case in a manner guided by standard approaches that have been developed for environmental assessments.

⁸ Valued Environmental Components (VECs) and Valued Components (VCs) are equivalent. Use of the acronym VC was used in environmental assessments carried out under the federal environmental assessment process under the Canadian Environmental Assessment Act (2012) and is recommended to be used in assessments carried out under its replacement, the federal Impact Assessment Act (IAA) (2019).

5.2 VALUED ENVIRONMENTAL COMPONENTS

The list of Valued Environmental Components considered for the assessment, and interactions with project components, are presented in Table 9. The environmental effects and potential impacts of the project along with their significance and suggested mitigations are outlined in the following and are summarized in Tables 10 and 11.

Table 9. Valued Environmental Components (VECs) for Granite Village Quarry Expansion	
Biophysical	Socio-economic
Air Quality, Noise and Light	Mi'kmaq
Groundwater	Recreation, Tourism & Viewscape
Hydrology	Recreational, Commercial & Mi'kmaq Fishing
Water Quality	Archaeological, Cultural and Historical
Freshwater Aquatic Environments and Wetlands	Economy, Land Use and Value
Terrestrial Environments	Transportation
Coastal Environments	Residential Use
Fish & Fish Habitat	Commercial /Industrial Use
Flora & Fauna & Habitat	Water Supplies & Residential Wells
Species at Risk	Parks & Protected Areas
Natural Areas & Wilderness	Forestry, Hunting & Trapping

5.3 SOCIOECONOMIC IMPACTS

5.3.1 MI'KMAQ

The Mi'kmaq maintain a general interest in all lands in Nova Scotia which they claim to have never surrendered, ceded, or sold the Aboriginal title. As co-owners of the land and its resources, they expect that any potential impacts to rights and title be addressed. Mi'kmaq occupied much of Nova Scotia prior to European contact, and lands were used to varying degrees for habitation, hunting and fishing, as noted in Sections 4.3.1 and 4.3.8. In more recent times, treaties made with the British and continued through Canadian law have maintained their rights. The Atlantic Coast was used by Mi'kmaq, both as a source of food and as a transportation corridor; however, there is low potential for occurrence of Mi'kmaq archaeological resources at the quarry site (CRM 2022).

The quarry is not near Mi'kmaq First Nations in Southwestern Nova Scotia and no First Nation activities are expected to be directly affected by the Granite Village Quarry. Best management practices used at the site will reduce any potential impacts quarry activities may have on water quality and quantity and fish habitat, and will be validated through a surface water management and monitoring program that will be established through the subsequent Industrial Approval process. Land around the existing Granite Village Quarry may be used by Mi'kmaq living in the area and /or other local residents for nature-based activities such as walking, ATV use, bird watching, and hunting or fishing (either recreationally or for subsistence). The land area affected is small in relation to the available wildlife habitat in the area, and would not likely affect wildlife or fish populations, potentially used by Mi'kmaq. Activities are seasonal and therefore would not interfere with other uses such as hunting, trapping and snowmobile and recreational vehicle use during the winter and

spring. Since quarry operations are not expected to change in scope or to increase in frequency or intensity from past use, there is unlikely to be a change in the cumulative effects of other activities in the area; consequently none of these effects are considered significant.

5.3.2 RECREATIONAL ACTIVITIES

The coastal zone between Highway 103 and the Atlantic Ocean has been managed by the Province of Nova Scotia, the federal government, and conservation organizations and groups to protect environments and associated wildlife and species of conservation concern and to provide the public with opportunities to experience them. Residents of the area also have the opportunity to live in a relatively untouched natural environment with a low population density leading to local uses such as hunting and fishing, walking/hiking and home-based recreation (e.g., gardening) concentrated around roads and population centres in the area. The principal effects of the quarry on tourists and locals using the area for recreation would be from truck and vehicle traffic and noise associated with the operation of heavy equipment—however these interactions are a small part of other industrial activities including logging trucks and equipment; and general high-volume traffic along the major Highway 103 transportation route to which locals are exposed. Noise from routine operations at the Quarry would not be heard in the nearby communities of East Side Port l’Hebert and Port Joli or in Thomas Raddall Park; noise from blasting is likely to be heard over a wide area, one to two times a year. Unlike the other activities, the effects of the quarry would occur principally when the quarry is operating, while other activities in the area could occur year-round. Operations at the quarry would be cyclic, likely occupying several weeks to months during the construction season during the years in which the site is active, and the site is regulated and monitored through an Industrial Approval issued by the Province. Although quarry operations could likely be heard near the quarry and residents would experience truck traffic and other effects of quarry operations, the frequency and scope of the quarry is not expected to increase from past use, and any impact on normal activities of residents as a result of the proposed quarry expansion are expected to be negligible.

5.3.3 TOURISM AND VIEWSCAPE

Expansion of the existing Granite Village Quarry is not expected to have a significant impact on tourism and viewscape. The principal interactions would be noise, and truck traffic transporting aggregate to job sites. Some operations at the quarry may be heard at the nearby Port l’Hebert Provincial Park, but not at Thomas Raddall or Kejimkujik Seaside Adjunct, and if heard would be against a background of truck noise on Highway 103. Blasting, which may be heard at greater distances, is of short duration and occurs infrequently—one to two times a year. The expansion will not result in a change in annual or daily activity, or visibility. Highway 103 is an important local travel and tourist route and already has high volumes of traffic of various kinds, including those associated with local resource industries including forestry and fishing, and traffic associated with the quarry would be a minor component. Truck and equipment traffic accessing and exiting the site onto Highway 103 is expected to be the main interaction with tourists. This traffic is expected to be seasonal and occasional, will be similar now as in the future, and would likely be only a minor impediment to tourist vehicle traffic in the area. Overall, the impacts on viewscape and tourism are expected to be negligible.

5.3.4 RECREATIONAL, COMMERCIAL & MI’KMAQ FISHING

Recreational fishing in watercourses near the Quarry is not expected to be affected by activities at the quarry. The amount of runoff from the quarry is small and high quality, and will have a negligible impact on the

watercourses and fish habitat downstream. Surface waters at the site have high quality, including low turbidity and neutral pH, which would lead to good quality of waters downstream for fish. Overall, a negligible impact of the quarry on recreational, commercial, and Mi'Kmaq fishing is expected.

5.3.5 ARCHAEOLOGICAL/CULTURAL/HISTORICAL

The land proposed for the quarry expansion has low potential for pre-contact and/or early historic First Nations or European archaeological resources (CRM 2022). The site is not expected to have been a prime area used by Mi'Kmaq pre-contact. If an archaeological feature of significance is encountered during quarry activities, particularly evidence of Mi'kmaq occupation, operations will be stopped, and experts in the field will be consulted to ensure the artifact or feature is not disturbed and is adequately documented and preserved.

5.3.6 ECONOMY, LAND USE AND VALUE

Activities at the Granite Village Quarry do not restrict forestry in the area and in fact, support those operations by helping to maintain the access road to the site which is also used by logging trucks and equipment. Aggregate from the quarry is used in projects in the area at a competitive cost due to the proximity of the quarry. The quarry provides employment for locals and generates tax revenue. The existing quarry has been operating at the site with little to no impact, while providing economic development and a source of aggregate for local construction projects.

5.3.7 TRANSPORTATION

The Granite Village Quarry currently generates a comparatively low level of truck traffic on highways in the area, and activity levels are not expected to increase. Consequently, the quarry is not expected to change existing traffic volumes. The intersection of the Quarry access road with Highway 103 has good sightlines but may lead to hazardous encounters due to the long stretch of highway on either side which do not have significant on-turning traffic; this effect can be mitigated by applicable warning signs placed far in advance of the access road to indicate the likely presence of heavy equipment and trucks turning. Safe use of the road and avoidance of accidents is essential, both for human impacts and the potential impacts of vehicle accidents and spills on the local watercourses and environments. Equipment and truck operators for the quarry will be given instruction on safe and environmentally acceptable procedures. With suitable foresight and care, the impact of the project on transportation and safety is expected to be minimal, will little or no change from previous operations at the quarry.

5.3.8 RESIDENTIAL USE

There are no permanent residences within 800 meters of the Quarry and only a single seasonal residence—a cottage—is situated about 500m west of the quarry access road. Dexter currently monitors for blast intensity at the cottage. Therefore, overall, there are negligible concerns over effects on groundwater wells or impacts of blasting on building structures. Light-shine from the quarry, on rare occasions when the quarry may be operated at night, could be seen residents of East Side Port L'Hebert, but would be controlled by proper environmental management practices at the site (i.e. downward directional lighting).

Blasting could be heard by residents of distant communities, but would be instantaneous and infrequent (e.g., one to two times per year during years in which the quarry is active). All blasting events will continue to be monitored for concussion and ground vibration to ensure blasting limits are achieved.

Most operations at the site occur during daylight hours. On rare circumstances when they are undertaken at night, activities will involve minimal lighting, which likely will not be visible to residents of East Side Port l'Hebert or Port Joli and are unlikely to be a significant disturbance to residents. The quarry includes signage with phone numbers and contact persons should any members of the community have inquiries. A complaint resolution procedure will be put in place by Dexter to address complaints and concerns.

5.3.9 COMMERCIAL/INDUSTRIAL USE

There are no businesses in the vicinity of the Quarry which could be affected. The quarry contributes to net economic benefit in the community through supporting local trucking operations and providing access to aggregate and other quarry products.

5.3.10 WATER SUPPLIES AND RESIDENTIAL WELLS

Surface water and drilled wells associated with the nearest residences and businesses in Port Joli and East Side Port l'Hebert, as well as in Thomas Raddall Provincial Park are too far from the quarry and in different groundwater regimes, to be affected by blasting at the quarry. Groundwater recharge generated by the quarry is likely to be of high quality (low conductivity and dissolved solids and neutral in pH). Best management practices surrounding blasting will be followed, established operational procedures for fueling will be followed, and a contingency plan will be maintained to mitigate reasonable impacts on aquifers at the site.

5.3.11 PARKS AND PROTECTED AREAS

The proposed expansion of the Granite Village Quarry site will not change the intensity or frequency of activity at the site, and therefore the degree of any interactions with the managed parks and protected areas in the Port Joli to Sable River area is not expected change. The quarry and its expanded area will not be visible to tourists traveling by road. With no expected change in the scope or frequency of quarry activity due to the expansion, road traffic activity due to the quarry is not expected to change, or be high enough in volume to disrupt tourist traffic. Occasional blasting (one to two times a year) may be heard in the Provincial Parks in the area and at the Kejimikujik Seaside Adjunct, but noise levels generated from routine operations at the quarry are not expected to be heard. Occurrences of blasting are brief and infrequent, and not likely to be a significant concern to visitors/users of those areas. The quarry will be reclaimed at the end of its useful life. Expansion of the quarry will not affect the integrity of any nearby protected areas. The Granite Village Quarry is within the South Shore (Port Joli Sector) Important Bird Area (IBA) found along the coast. The IBA designation is intended to support marine and other coastal birds and wildlife and extends inland 2.5 kilometers from the coast, encompassing—including the lands around the quarry—Highway 103 which is a major source of noise and traffic. The expanded quarry will remove terrestrial upland forest habitat of the IBA which is not used by coastal birds, and is in an area already developed for transportation (the Highway 103 corridor), and high voltage electrical transmission lines, and therefore the habitat is in a highly modified state. Overall, the change due to the expansion of the quarry on the IBA will be negligible.

5.3.12 RESOURCE USE—FORESTRY, HUNTING & TRAPPING

Use of the land in the expansion area will remove the potential for future forestry use of the site, at least until after the quarry is closed and rehabilitated in future; however, the area occupied by the quarry is relatively small in relation to the available forest resources in the area, and the overall impact on economic return is expected to be small. The quarry will occupy a relatively small area of habitat for furbearing and game species and will not have a significant impact on hunting and trapping.

5.4 BIOPHYSICAL IMPACTS—IMPACTS OF THE PROJECT ON THE ENVIRONMENT

5.4.1 AIR QUALITY, NOISE, AND LIGHT

The intensity, frequency, and scope of quarry activities are not expected to change from present levels, which is governed by the amount of local demand for aggregate, which does not change appreciably from year to year, and which in a rural area such as Queens County, is not typically high. Operation of a quarry has the potential to generate dust, combustion emissions, noise, and light. In particular, operation of heavy equipment (e.g., earth movers, crushers), rock drilling and blasting, as well as onsite routine operations contribute to increased dust and particulate levels. Dust management will be undertaken, including use of water spray and covering working and laydown areas with blasted rock, dust suppression systems on crushing equipment, reducing vehicle speeds, and using tarpaulins on truck boxes. Airborne particulate emissions are typically monitored in accordance with the site Industrial Approval, the Pit and Quarry Guidelines, and the Nova Scotia Air Quality Regulations. Industry standards and best practices will be followed during all phases of operations.

Exhaust emissions are generated by the operation of vehicles and equipment. Vehicles and heavy equipment are expected to follow efficient operating procedures such as not idling unnecessarily when not in use. Given the relatively small size of the quarry and the scope of the planned operations, these emissions will be minimal (i.e., restricted to several pieces of heavy equipment, earth movers, trucks etc. as well as operation of crushers and asphalt plant) and will be localized and similar in type and amount to those produced during previous operations. Ambient air quality monitoring will be conducted at the request of NSECC, in accordance with the terms and conditions of the Industrial Approval.

With no anticipated change in scope or frequency of operation, noise levels from the expanded quarry are expected to be similar to those already produced at the site. Noise mitigation will include maintaining vehicles and heavy equipment in proper working order; planning traffic flow patterns around the site to reduce the need for heavy equipment to back up (thus reducing the frequency of backup signals); and ensuring that parts of equipment capable of causing noise (e.g., dump doors on truck boxes) are secured. Dexter will ensure that heavy equipment does not exceed the noise limits specified in the Nova Scotia Pit and Quarry Guidelines. Blasting is expected to occur infrequently (1-2 times per year). All blasting events will be monitored for concussion and ground vibrations to confirm adherence to regulated levels. Noise monitoring will be conducted at the request of NSECC, in accordance with the terms and conditions of the Industrial Approval.

Nighttime operations will only occur if necessary, and will adhere to directions in the Industrial Approval from NSECC. Light during nighttime operations— particularly during times of low-hanging cloud and fog— can attract migrating birds traveling over water towards the rest of the mainland of Nova Scotia. If nighttime

operations are required then directional lighting will be used to minimize emanation of light upward and laterally over the horizon.

5.4.2 GROUNDWATER

Activities associated with the project including forest clearing, grubbing and removal of overburden, and blasting, influence groundwater flow locally in the vicinity of the quarry, but are not expected to influence groundwater aquifers over a broader area. The amount of recharge area involved in project activities is small in relation to the overall size of the aquifers in the general vicinity; the water table in bedrock below the quarry floor will continue to recharge at approximately the same rate as at present. A contingency plan will be established to manage emergency response in the unlikely event of spills or releases of fuels or hazardous chemicals potentially impacting groundwater in the area. Following EA Approval, a groundwater monitoring program will be developed as part of the subsequent Industrial Approval Amendment process. The groundwater monitoring program will establish baseline groundwater quality and quantity prior to the quarry expansion, and will provide regular monitoring to ensure that any potential impacts associated with the quarry expansion are identified. Overall, the effect on overall groundwater distribution and flow are expected to be negligible.

5.4.3 HYDROLOGY

Due to the relatively small area of the expanded quarry, and its position in the local catchments, the Quarry will have a negligible effect on surface waters in the immediate vicinity. This was shown by a Water Balance Assessment conducted by Mr. Jim Fraser, M.A.SC, P.Geo, Consulting Hydrogeologist, for the environmental assessment of the quarry. The proposed expansion area is small and consequently the effect on supply to surface waters in the vicinity is not expected to be disrupted significantly. Surface water runoff from the quarry is inherently intermittent due to the dominance of precipitation in water balance, and most is expected to enter the water table directly through percolation through cracks and fissures in the bedrock; however, surface flows will be moderated by the surface water management system and will ensure that flow characteristics in downstream areas are not affected significantly. Runoff will be managed to ensure that it meets acceptable environmental standards.

5.4.4 WATER QUALITY

Water quality leaving the quarry via surface or groundwater is not expected to be impacted significantly outside the expansion area, in particular watercourses in the area which are tributaries of Port l'Hebert Brook. Water Quality at the site is high, because of the management measures to reduce erosion and sedimentation on the quarry floor; and the low-contaminant characteristics of the bedrock and location of the site high in the local catchment area. Quarry rock is within acceptable limits for sulphur and acid-generating potential. Blasting is not expected to result in groundwater quality changes. Forest clearing and grubbing activities can lead to releases of fines from the soil, resulting locally in elevated suspended sediment levels but little surface water flow from grubbed areas is expected off the site in part due to the small area involved, and sediments will be removed during flow through the adjacent landscapes. Possible release of other contaminants such as oils and lubricants from operating equipment is expected to be mitigated by normal precautions on equipment operations and fuelling locations. Contaminants arising from operations of the quarry are expected to be exceedingly low. All activities will conform to the Nova Scotia Erosion and Sedimentation Control Handbook (NSE 1988) and the Nova Scotia Pit & Quarry Guidelines (NSE 1999). Runoff

from road surfaces potentially can lead to temporarily elevated suspended sediment levels in flows in ditches adjacent to them, although effects would be short term. Impact of the quarry on water quality in adjacent streams and other waters is expected to be negligible. A surface water management and monitoring program will be established through the subsequent Industrial Approval Amendment process following the Environmental Assessment Approval.

5.4.5 FRESHWATER AQUATIC ENVIRONMENTS AND WETLANDS

There are no permanent streams in the proposed expansion area. Intermittent watercourses and flowages downstream from the quarry are not expected to be impacted significantly. Quantities of runoff arising from the site in future from the outer slopes of berms, product storage piles, and grubblings piles will be approximately the same as at present and will remain in the same watershed. The quarry is unlikely to generate significant quantities of contaminants or suspended sediments that could impact any freshwater habitat. Ponds and wetlands at the site will be avoided in the current expansion area. A 30 meter buffer will be maintained between future site operations and the wetland complex and ponds to the north. No further development of the quarry will occur where historic operations have previously encroached within the buffer. The small wetlands located at the southeast end of the study area may be fully or partially removed as a result of the quarry expansion. Prior to physical disturbance, a wetland alteration approval will be obtained, including appropriate wetland compensation for the impacted area.

5.4.6 TERRESTRIAL ENVIRONMENTS

Proposed expansion will utilize areas which are mainly medium-aged deciduous and mixed forest—types which are common in the general vicinity, and in particular locally at the site—and the quarry will not remove a large proportion of either type. No unique habitats were identified at the site. Dust from operations may affect adjacent forest communities although the impacts are likely to be negligible.

5.4.7 COASTAL ENVIRONMENTS

The coastal zone between Highway 103 and the Atlantic Ocean is a largely undisturbed and distinctive area, in an area which has been largely free of urban development. This area has become valuable not only for the natural features and scenic and wilderness values of undisturbed sites and for wildlife (e.g., Piping Plover), but also for tourism and recreation. Although the Quarry is on the margin of an important management zone which has been developed to protect these values, it is also in an industrial corridor due to the presence of Highway 103. The area is occupied by utility corridors for transmission lines and communications towers, is an active zone for forestry, and formerly held a railway line. Current levels of activity in the corridor have had minimal impact on the other uses of the coastal zone. The expansion of Granite Village quarry will not add to the noise and traffic and therefore the overall effect is expected to be minimal.

5.4.8 FISH AND FISH HABITAT

None of the proposed project activities will physically impact potentially fish bearing streams. There is no fish habitat on site. Surface runoff from the site enters intermittent flowages some distance from the site. No fish were found in flowages leading from the site and no fish habitat was found. The Water Balance Assessment indicates that the expansion will not affect the supply of water to adjacent areas significantly. Water quality typically found in runoff from the quarry will be monitored and is expected to meet NSECC guidelines and limits stipulated in the Industrial Approval. The closest watercourses are more distant than 200 meters from the study area which is considered a safe separation from blasting activities. All guidelines

for activities and timing of blasting in the quarry will be followed. Overall, the effects of the quarry construction and operations on fish and fish habitat are expected to be negligible.

5.4.9 FLORA AND FAUNA AND HABITAT

Expanding the Dexter Granite Village Quarry will remove existing terrestrial ecosystem (plants and animals) in the footprint of the quarry. With time, areas no longer suitable for quarry operations will be remediated, through a site reclamation plan which has been established as a condition of quarry Industrial approval. Plant and animal communities that arise in remediated areas will likely differ to some degree from those at present; however, a goal of remediation will be to ensure that conditions (e.g., soil types and topography) are reasonably restored to pre-existing conditions, to allow natural communities to re-establish. During recovery and revegetation of abandoned areas, the seeding in and succession of forest species will provide habitat for a moderate diversity of species which will change with time. Removal of forest cover is a feature that quarry development shares with logging activities, which affects local ecosystems to a moderate degree, and is allowed in Nova Scotia. Normal management practices regarding forest clearing, such as avoidance of cutting or major clearing activities during critical breeding periods of songbirds from mid-April to mid-September, will reduce harm to nesting birds in forest areas. Expansion of the Granite Village Quarry will result in only a comparatively small loss of less than 4 ha in the coverage of natural and mature forest stands in the area and is expected to have comparatively small impact on interior forest birds and wildlife. During normal operations, modified areas of the quarry offer potential nesting sites for certain species of birds and other wildlife, including hunting spaces for species such as owls and nesting for ground nesting birds such as nighthawks. Quarry employees should be educated on the need to check areas for activity and nests including both ground- and tree-nesting birds, before undertaking activities which would disturb established surfaces. Night operations and use of lights have various effects, including attracting insects which otherwise would need darkness to mate and reproduce; light pollution is considered to be an important factor globally in decline of songbird populations, through declines in populations of some insects. Many migrating birds follow the Atlantic coast on their southward migration; if night-time operations are required, in particular during fall migration periods (August-September) when lights have the potential to attract migrating birds, downward directional lighting will be used which focuses downward and below the normal horizon, to limit visibility by birds and insects from a distance.

5.4.10 SPECIES AT RISK

No federally or provincially-listed species at risk, or species more sensitive than S3 ranking (vulnerable), were found in the study area. No American Marten or Canada Lynx (both provincially listed as Endangered and which can occur in Queens County) have been recorded within 25 kilometers of the site and neither have been trapped recently in the area, and therefore the quarry will not have a significant potential for impacting them or their habitat. Common Nighthawk, a ground-nesting species, potentially could nest in grubbed and marginal but open areas of the quarry; employees should be made aware of the need to check areas for activity and nests before undertaking activities which would disturb established surfaces. Activities such as logging and site clearing should be scheduled outside the April to mid-September nesting period for breeding birds. Lights used during night operations during nesting and migration periods would attract various bird species and insects, which could include species at risk. Lighting used at the site should focus downward and below the normal horizon, to limit visibility from a distance.

5.4.11 NATURAL AREAS & WILDERNESS

Natural areas in the vicinity of the site such as the Tidney River Wilderness Area (Figure 24) and Provincial Parks such as Thomas Raddall and the Port l'Hebert Provincial Park are appreciated by locals and tourists alike. The proposed expansion of the Granite Village Quarry will affect a small proportion of the natural landscape at the site, in an area that has been actively logged, and is not in any protected area. Consequently, it will have a negligible effect on visitors to the area who are looking for nature experiences. Dexter is committed to minimizing potential effects of the quarry, in particular to minimize traffic, noise, dust and light from operations to the extent possible. The quarry expansion is not expected to change the frequency, intensity, or scope of operations, and consequently the already negligible impact on natural areas and wilderness is expected to continue to be low. Restoration will also consider values important in conservation of biological communities and ecosystems, as well as changes in physical conditions that could affect those communities. Normal procedures such as dust control and light management will help to minimize impacts on natural and wilderness values at the site.

6 IMPACTS OF THE ENVIRONMENT ON THE PROJECT

Granite Village Quarry will not be impacted to a significant degree by weather, including high rainfall and precipitation. Quarry design, which includes site water management, will allow flows generated by extreme rainfall events to be managed. As part of the subsequent Industrial Approval Amendment process, a Stormwater Management Plan and Erosion and Sediment Control Plan will be developed, which will help to control the effects of extreme rainfall events. The site may, from time to time, experience high winds due to its proximity to the coast, and potentially wind damage to temporary buildings and structures could occur, and will be considered in contingency planning for the site. Aggregate and other rock products produced and stored at the site are stable under varying conditions of rainfall. Although extreme rainfall events may currently lead to high flows in watercourses near the site, such flows will be manageable through site design and infrastructure.

Table 10. Potential interactions between project activities and operations and Valued Environmental Components (VECs) for Granite Village Quarry expansion.

General Category of VEC	Biophysical										Socioeconomic										
	Air Quality, Noise and Light	Groundwater & Hydrology	Water Quality	Freshwater Aquatic Environments and Wetlands	Terrestrial Environments	Coastal Environments	Natural Areas & Wilderness	Fish and Fish Habitat	Flora & Fauna Species & Habitat	Species at Risk	Mi'kmaq	Cultural/Historical	Recreation, Tourism & Viewscape	Residential Use	Recreational, Commercial & Mi'kmaq Fishing	Water Supplies/ Residential Wells	Economy, Land Use, and Value	Transportation	Commercial /Industrial Use	Parks & Protected Areas	Forestry Hunting /Trapping
Project Component (potential interactions shown by ✓)																					
CONSTRUCTION																					
Site Acquisition, Use/Removal of Resources	✓		✓		✓		✓		✓		✓	✓	✓				✓	✓	✓		✓
Site Clearing/Grubbing	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓						✓	✓
Drilling	✓	✓	✓			✓	✓		✓		✓		✓				✓			✓	
Blasting	✓	✓	✓			✓	✓	✓	✓	✓		✓	✓		✓	✓				✓	
Lights & Noise	✓					✓	✓		✓	✓		✓	✓							✓	
OPERATION																					
Moving/Transporting Rock and Product	✓					✓	✓		✓		✓		✓	✓			✓	✓	✓	✓	
Crushing	✓					✓	✓		✓	✓		✓	✓				✓			✓	
Washing		✓	✓	✓				✓		✓				✓							
Lights & Noise	✓					✓	✓		✓	✓		✓	✓							✓	
Site Runoff Management		✓	✓	✓				✓						✓							
Portable Asphalt Plant	✓					✓	✓		✓	✓		✓	✓				✓	✓		✓	
Onsite Materials Storage			✓																✓		
Accidents (Fires/Oil & Fuel Spills)	✓	✓	✓	✓			✓	✓	✓			✓	✓		✓					✓	✓

Table 11. Summary of impacts and mitigation on Valued Environmental Components, Granite Village Quarry Expansion.						
VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Suggested Mitigation	Significance after Mitigation
BIOPHYSICAL COMPONENTS						
Air Quality, Noise & Light	Construction	Noise and dust from heavy equipment during site clearing and grubbing.	Significant	Negative	Take steps to reduce noise sources such as engine braking. Maintain vehicles and equipment to reduce noise and emissions generated from worn parts.	Not significant.
		Drilling and blasting.	Significant	Negative	Monitor noise levels and undertake to avoid exceedances of regulatory levels.	Not significant.
		Light from the quarry can be seen in neighbouring areas.	Significant	Negative	Use directional lighting with downward and lateral focus to minimize light leaving the quarry during night operations.	Not significant.
	Operation	Noise from drilling and blasting; crusher; heavy equipment operation; dust.	Significant	Negative	Monitor noise levels and undertake to avoid exceedances of regulatory levels. Institute measures for dust control.	Not significant.
		Noise from engine braking of trucks on access Road interfering with local enjoyment of local Parks.	Significant	Negative	Instruct truck operators to avoid use engine braking leaving the quarry and in populated areas.	Not significant.
		Light from the quarry can be seen in neighbouring areas.	Significant	Negative	Use directional lighting with downward and lateral focus to minimize light leaving the quarry at night.	Not significant.
		Dust from crushing operations and site activities.	Significant	Negative	Water spray systems on crushing spreads to reduce dust. Water spray or other approved dust suppressant on quarry access road and working areas to reduce the resuspension of dust.	Not significant
		Forest and soil removal changes surface and ground water flow levels and patterns.	Negligible	Negative	Use site runoff management to minimize impacts. Likely changes in groundwater and runoff patterns will be small.	Not significant.
	Groundwater/ Hydrology	Construction	Forest and soil removal changes surface and ground water flow levels and patterns.	Negligible	Negative	Use site runoff management to minimize impacts. Likely changes in groundwater and runoff patterns will be small.
Operation		Blasting fractures bedrock, disturbs till, and changes groundwater flow patterns. Drilled wells	Significant	Negative	Analyze groundwater quality and movement to determine changes.	Not significant.

Table 11. Summary of impacts and mitigation on Valued Environmental Components, Granite Village Quarry Expansion.						
VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Suggested Mitigation	Significance after Mitigation
		in bedrock and surface wells can be disturbed				
	Operation	Quarry and work areas change surface water flows. Increased peak stormwater flows. Washing product creates silt-laden surface flows.	Significant	Negative	Onsite water management to moderate extreme surface water runoff and suspended sediment levels; measures to maintain normal flow regime. Aggregate washing arranged in closed loop system to retain all wash water onsite.	Not significant.
	Operation	Accidental hydrocarbon spills and blasting residues contaminate groundwater.	Significant	Negative	Measures to minimize danger of spills; monitor and control nitrates from blasting; proper fuel handling strategies, onsite emergency numbers, spill kits etc.; Avoid refueling near watercourses.	Not significant.
Water Quality	Construction	Altered surface water flows and turbidity in watershed flowages from site runoff.	Negligible	Negative	Erosion and sedimentation controls in work areas. Onsite water management to moderate surface water runoff and suspended sediment levels.	Not significant.
	Operation	Dust & suspended sediment from operations potentially enters local watershed. Chemicals (e.g., nitrates) from explosives entering runoff.	Significant	Negative	Onsite dust control and water management to moderate surface water runoff and suspended sediment levels. Erosion & sedimentation controls. Closely monitor chemical residues after blasting.	Not significant.
	Operation	Water chemistry changes in runoff from stockpiles stored on site.	Negligible	Negative	Best management practice allows leaving piles exposed to the environment. Monitor settling ponds; storm-water management.	Not significant.
Natural Areas & Wilderness	Construction & Operation	Presence of quarry, emissions, dust etc., detracts from public perception of wild quality of area. Site is not near popular wilderness areas.	Negligible	Negative	Area affected is small in relation to remaining natural areas, and previous development and logging has occurred in the area, diminishing value of natural areas and wilderness. Minimize footprint. Manage releases of dust and light, and control noise.	Not significant.

Table 11. Summary of impacts and mitigation on Valued Environmental Components, Granite Village Quarry Expansion.						
VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Suggested Mitigation	Significance after Mitigation
Freshwater Aquatic Environments	Construction	Potential for local high suspended sediments and nutrient levels from grubblings, road construction, and locally-diverted flows.	Negligible	Negative	Preserve wooded buffer areas for quarry. Onsite water management and sedimentation controls to moderate surface water runoff and suspended sediment levels.	Not significant.
	Operation	Surface runoff with dust, nutrients and contaminants. Residues from aggregate washing. Reduced water availability from evaporation from pit floor and exposed surfaces.	Negligible	Negative	Maintain forested buffers. Onsite water management. Use sedimentation ponds and store wash water during off peak season. Minimize unvegetated areas.	Not significant.
	Operation	Higher peak flows and suspended sediment during activities.	Significant	Negative	Onsite water management to store wash water. Preserve woodland in buffer areas of quarry.	Not significant.
	Operation	Releases of chemicals from blasting and runoff from materials stored on site.	Negligible	Negative	Isolate and treat runoff from work areas and stored materials piles.	Not significant.
	Construction & Operation	Accidental spills of hydrocarbons on site.	Significant	Negative	Provide pollution prevention and emergency measures.	Not significant.
Terrestrial Environments	Construction	Grubbing, road construction, pit preparation. Damage to natural forest ecosystem, and associated species.	Significant	Negative	Maintain property boundary buffers. Conduct species specific breeding bird surveys prior to development stages. Monitor species-at-risk birds. Monitor for invasive and exotic plant species. Conduct forest removal in small stages corresponding to site development and not in breeding period for birds.	Not significant.
	Operation	Dust, nutrient inputs from runoff, changes to environment and functioning of forest communities.	Negligible	Negative	Maintain property boundary buffers. Conduct species specific breeding bird surveys prior to excavation. Be aware of critical times for rare species which might occur.	Not significant.

Table 11. Summary of impacts and mitigation on Valued Environmental Components, Granite Village Quarry Expansion.						
VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Suggested Mitigation	Significance after Mitigation
Coastal Environments	Construction	Noise generated by equipment preparing the site may be heard in communities, parks and nature areas.	Negligible	Negative	Use best operational procedures and limit operations to acceptable times of day.	Not significant.
		Blasting can be heard in communities, parks and nature areas.	Negligible	Negative	Use efficient blasting techniques to minimize the number and intensity of blasts.	Not Significant
	Operation	Light pollution during night operations affects migratory birds and may affect park visitor experience.	Negligible	Negative	Limit operations to daylight hours, when possible. Use downward facing lighting equipment.	Not Significant
		Presence of quarry contrasts with natural environmental features in coastal zone.	Negligible	Negative	Area around Highway 103 is already subject to industrial and commercial uses such as forestry. Maintain entrance to quarry in natural condition.	Not Significant
		Quarry is within Important Bird Area.	Negligible	Negative	The IBA focuses on coastal birds and wildlife which are not affected directly by quarry activities. Procedures to limit light and avoidance of night-time operations, when possible.	Not Significant
Fish & Fish Habitat	Construction	Change runoff patterns at site in local and adjacent watersheds.	Negligible	Negative	Runoff management to maintain flow to natural watersheds and to avoid sudden runoff events.	Not significant.
	Operation	Site runoff management and water use affects hydrological and groundwater regime.	Negligible	Negative	Ensure the runoff from the site is managed to avoid sudden runoff events.	Not significant.
	Construction & Operation	Small releases of oils, hydraulic fluids etc. from operating equipment. Accidental spills of hydrocarbons on site.	Negligible	Negative	Maintain equipment to minimize loss of lubricants and fuels. Provide pollution prevention and emergency measures.	Not significant.
	Operation	Accidental spills into watercourses due to vehicle accidents on roads in area.	Negligible	Negative	Recommend safe driving practices for truckers and staff and reduce speed in vicinity of quarry key intersections. Provide	Not significant.

Table 11. Summary of impacts and mitigation on Valued Environmental Components, Granite Village Quarry Expansion.						
VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Suggested Mitigation	Significance after Mitigation
					pollution prevention and emergency measures.	
Terrestrial Flora & Fauna & Habitat	Construction	Removal of Existing Forest Communities	Negligible	Negative	Restore damaged and unused parts of the site (e.g. grubblings and waste rock piles) as soon as possible. Long-term site rehabilitation plan developed with NSECC. Cut forest short term only as needed to expand quarry. Conduct species specific breeding bird survey in northeast part the property prior to excavation.	Not significant.
	Construction & Operation	Accidental contaminant releases, contamination of habitat.	Significant	Negative	Provide pollution prevention and emergency measures & response capability. Remediate areas affected by spills.	Not significant.
		Artificial light from operations influences movements of birds and insects.	Significant	Negative	Use directional lighting with downward focus to minimize light leaving the quarry.	Not significant.
		Removal of potential forest and wildlife resource (i.e. wildlife habitat)	Negligible	Negative	Small area affected relative to total available. Minimize footprint of quarry. Restore and rehabilitate areas not used. Leave mature standing trees where possible as nest cavities.	Not significant.
		Quarry affects wildlife movement patterns and connectivity of habitats.	Negligible	Negative.	Restoration should include consideration for wildlife movement through the restored site.	Not significant.
Species at Risk	Construction	Removal of potential habitat for SAR occurring in the area.	Negligible	Negative	Small area affected relative to total available. Minimize footprint of quarry.	Not significant.
	Operation	Sound from blasting can harm bats and birds.	Negligible	Negative	Minimize blasting activity and concentrate in summer (outside breeding and migratory periods for birds and bats).	Not significant.
		Light influences movements of species at risk birds migrating overland.	Significant	Negative	Use directional lighting with downward and lateral focus to minimize light leaving the quarry.	Not significant.

Table 11. Summary of impacts and mitigation on Valued Environmental Components, Granite Village Quarry Expansion.						
VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Suggested Mitigation	Significance after Mitigation
		Open and revegetated areas and grubblings piles may be occupied by nesting species such as nighthawks.	Significant	Negative	Educate personnel to look for bird life prior to activities; periodically conduct nesting bird survey at site to identify bird issues.	Not significant.
SOCIOECONOMIC COMPONENTS						
Mi'kmaq	Construction and Operation	Any land use conflicts with Mi'kmaq Right to Use land	Significant	Neutral	Engage with Mi'kmaq in developing quarry.	Not significant.
		Contamination of surface waters may affect fish populations in area watercourses	Negligible	Negative	Employ surface water monitoring program. Use Best Management Practices for quarries. Avoid accidental releases of contaminants. Avoid vehicle accidents.	Not significant.
Archaeological, Cultural and Historical Significance	Construction	Expansion may affect undiscovered artifacts.	Not significant	Negligible	Unlikely that artifacts occur at site. Stop work and report discoveries. Minimize project footprint.	Not significant.
Recreation	Construction & Operation	Quarry traffic uses both resident and tourist use on Highway 103.	Not significant	Negative	Users will be aware of activity at quarry but will not be otherwise impacted by it. Signage of truck use, dangers, and quarry activity.	Not significant.
Tourism and Viewscape	Construction & Operation	Presence of quarry affects public perception of wilderness values.	Negligible	Negative	Cannot be seen from Highway 103 or other nearby areas. Maintain entrance to quarry access road in natural condition.	Not significant.
Residential Use	Construction & Operation	Noise; light pollution perceived by rural residents and in Port Joli, Port l'Hebert; operation of trucks and transportation of heavy equipment along highways used by locals.	Significant	Negative	Use best management practice. Provide community with safety information for truck traffic and quarry operations.	Not significant.
Recreational and Mi'kmaq Hunting and Fishing	Construction & Operation	Accidental hydrocarbon spills and blasting residues contaminate surface waters.	Negligible	Negative	Not an important local activity. Provide pollution prevention, emergency measures & response capability. Identify and control contaminant releases.	Not significant.

Table 11. Summary of impacts and mitigation on Valued Environmental Components, Granite Village Quarry Expansion.						
VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Suggested Mitigation	Significance after Mitigation
	Construction	Loss of forested area under quarry footprint.	Not significant	Negative	Small area affected. Rehabilitate areas no longer needed for activity and future development. Minimize cutting outside quarry footprint.	Not significant.
Water Supplies & Residential Wells	Construction and Operation	Blasting potentially impacts local aquifers.	Negligible	Negative	No wells within 1 km. Develop groundwater-monitoring plan in consultation with NSECC.	Not significant.
Economy, Land Use and Value	Construction & Operation	Removal of potential forest and wildlife resource (e.g., forestry & trapping).	Not significant	Negative	Small area affected relative to total land available. Minimize footprint of quarry. Restore and rehabilitate areas not used.	Not significant.
Transportation	Operation	Wear on highway	Negligible	Negative	Current levels low and will not increase.	Not significant.
	Operation	Collisions with trucks and equipment on Hwy 103.	Not significant	No Change	Use good signage, have speed policy in vicinity of quarry. Safety training for truck drivers.	Not significant
Industrial & Commercial Use	Operation	Use of access road for forestry.	Negligible	Neutral	Quarry helps to maintain access roads to site for future development.	Not significant.
Resource Use Forestry, Hunting & Trapping	Construction & Operation	Removes woodland; game habitat.	Not significant	Negative	Relatively small area is used. Minimize footprint.	Not significant.
Parks and Protected areas	Construction & Operation	Noise and blasting likely can be heard from Thomas Raddall and Port l'Hebert Provincial Park and other parks and nature areas in the general vicinity.	Not significant	Neutral	Employ best management practices for all aspects of quarry operation, in particular control of noise, light, & dust.	Not significant.

7 MONITORING

As part of the subsequent Industrial Approval Amendment application (following successful EA approval) Dexter will establish several management and monitoring programs to validate the environmental mitigation strategies that will be implemented at the site. Monitoring programs will include:

- Surface water monitoring plan to monitor water quality in local water resources which may be impacted by the quarry;
- Groundwater monitoring plan to monitor hydrogeological conditions and groundwater quality;

- Blast monitoring plan (noise and concussion) for all blasting events conducted at the site;
- Noise monitoring plan (at NSE request);
- Dust monitoring plan (at NSE request); and
- Additional monitoring for select species and/or other environmental features (as necessary).

8 PUBLIC CONSULTATION

Informing the public and Mi'kmaq about proposed industrial activities which potentially affect them is an important part of environmental and project management. Potential benefits include exposure to local knowledge, which may improve environmental performance, and overall operations of the project; and public involvement and support in subsequent operations. In addition to contacts already made in developing this assessment and in conducting operations in the area, Dexter will be undertaking consultations with the local community through public notices, contacts with municipal and provincial government officials, and engagement with the Mi'kmaq about the project and its implications; as well as the plans for using the resources at the site in an environmentally acceptable manner.

9 PERSONAL COMMUNICATIONS

Local community member ATVing near property, June 2022.

Mr. Peter Kydd, Regional Biologist, Western Region, Nova Scotia Department of Lands and Forestry, August 2022.

10 REFERENCES

Anderson, A.R. and W.A. Broughm. 1988. Evaluation of Nova Scotia's Peatland Resources. Bulletin 6. Nova Scotia Department of Mines and Energy, Halifax, Nova Scotia.

Atlantic Conservation Data center (ACCDC). 2022. Report on the database search of species of conservation status for Granite Village, NS. Report to Envirosphere Consulting Ltd., March 2022.

Bartlett. 2021. The Amazing Adventures of Piping Plover "HL". Birds Canada. Featured News Stories. September 15, 2021.

Bush, P. and C. Baldo. 2019. Ecological Landscape Analysis, Ecodistrict 760: Sable 2019 Update for Part 1 and 2. Nova Scotia Department of Lands and Forestry, Forestry Division. 41 p.

Canadian Council of Ministers of the Environment (CCME). 1999. Water Quality Guidelines for the Protection of Aquatic Life. <http://st-ts.ccme.ca/en/index.html?chems=all&chapters=1&pdf=1>

Canadian Climate Normals. 2022. Canadian Climate Normals 1981-2010 Station Data: Liverpool Big Falls. Government of Canada. March 2022.

Cann, G.B. and J.D. Hilchey. 1959. Soil Survey of Queens County. Report No. 8, Nova Scotia Survey. 48 p.

Captain Little Seafood Ltd. 2016. <https://www.scotiafish.com/>

Cook, A.M., Hubley, P.B., Denton, C., and Howse, V. 2020. 2018 Framework Assessment of American Lobster (*Homarus americanus*) in LFA 27–33. DFO Can. Sci. Advis. Sec. Res. Doc. 2020/017. vi + 251 p.

Cultural Resource Management Group (CRM) Ltd. 2022. Granite Village Quarry Expansion, Archaeological Resource Impact Assessment 2022. Final Report to Municipal Enterprises Limited and the Special Places Program of NS Department of Communities, Culture and Heritage, April 2022.

Department of Fisheries and Oceans Canada [DFO]. 2022. Stock Status Update for American Lobster (*Homarus americanus*) in Lobster Fishing Area 33 for 2021. DFO Can. Sci. Advis. Sec. Sci. Resp. 2022/010.

Drage, N., Drage, J., Tipton, E., and Hartley, E. 2016. Results of a well water quality survey in Eastern Shelburne County. *Geoscience and Mines Branch*. Nova Scotia Department of Natural Resources, p. 29-37. <https://novascotia.ca/natr/meb/data/pubs/16re01/16re01-05drage.pdf>

Douma, S. L. 1992. Field relationships, mineralogy and structural features of the Port Mouton pluton, southwestern Nova Scotia. *Atlantic Geology*, 28(1), 85–100.

Environment and Climate Change Canada. 2016. Wind Atlas. <http://www.windatlas.ca/nav-en.php?field=E1&height=50&season=ANU&no=10>.

Johnson, K. 2018. Shelburne County is King of N.S. Seafood Purchase Values. *Atlantic Fisherman*. December 12, 2018. <https://atlanticfisherman.com/shelburne-county-is-king-of-n-s-seafood-purchase-values/>

Keppie, J. D. 2000. Geological Map of the Province of Nova Scotia, scale 1: 500000, digital version of Nova Scotia Department of Natural Resources Map ME 2000-1 compiled by BE Fisher and JC Poole. Scale, 1, 500000.

Maritime Breeding Bird Atlas. 2021. Second Atlas of Breeding Birds of the Maritime Provinces. Bird Studies Canada & Partners.

Moseley, M. 2007. Records of Bats (Chiroptera) at Caves and Mines in Nova Scotia. Curatorial Report 99, Nova Scotia Museum, Halifax: 21 p.

Nav Canada 2001. The Weather of Atlantic Canada and Eastern Quebec. Graphic Area Forecast 34. NavCan, Ottawa.

Nova Scotia. 2021. Nova Scotia Geoscience Atlas, <https://novascotia.ca/natr/meb/geoscience-online/about-database-am0.asp>, accessed August 2022.

Nova Scotia Communities, Culture and Heritage. 2022. Environmental Screening – Granite Village Quarry. Report to EnviroSphere Consultants Ltd, April 2022.

Nova Scotia Department of the Environment (NSE). 1988. Erosion and Sedimentation Control Handbook for Construction Sites. Nova Scotia Department of the Environment, Environmental Assessment Division. Canada.

Nova Scotia Department of Environment (NSE). 1999. Nova Scotia Pit & Quarry Guidelines. Nova Scotia Environment and Labour, Nova Scotia Environment Monitoring and Compliance Division. Canada.

Nova Scotia Department of Fisheries and Aquaculture (NSDFA). 2022. Licensed Aquaculture Sites in Nova Scotia. Information for the public. <https://novascotia.ca/fish/aquaculture/public-information/>

Nova Scotia Department of Lands and Forestry. 2020. Recovery Plan for Little Brown Myotis (*Myotis lucifugus*) in Nova Scotia. Nova Scotia Endangered Species Act Recovery Plan Series.

Nova Scotia Department of Lands and Forestry (NSDLF). 2022. Hunter and Trapper Harvest Statistics. Large Mammals. Furbearer Harvest Statistics. Upland Game. <https://novascotia.ca/natr/hunt/stats-index.asp>

Nova Scotia Department of Lands and Forestry (NSDLF). 2015. Ecological Landscape Analysis Sable Ecodistrict 760. https://novascotia.ca/natr/ELA/pdf/ELA_2015part1_2/760SableParts1&2.pdf

Nova Scotia Department of Municipal Affairs (NSDMA). 2019. Municipal Statistics Annual Report 2017-18. <https://beta.novascotia.ca/sites/default/files/documents/1-1759/municipal-statistics-annual-report-2018-en.pdf>

Nova Scotia Department of Natural Resources and Renewables (NSNRR). 2021. Recovery Plan for the Moose (*Alces alces Americana*) in Mainland Nova Scotia. Nova Scotia Endangered Species Act Recovery Plan Series. 96 pp.

Nova Scotia Environment. 2021. Nova Scotia Well Logs Database. <https://novascotia.ca/nse/welldatabase/wellsearch.asp>

Nova Scotia Environment. 2021. Protected Areas Interactive Map. Province of Nova Scotia. <https://novascotia.ca/parksandprotectedareas/plan/interactive-map/>

Nova Scotia Federation of Agriculture (NSFA). 2017. Statistical Profile of Queens County. <https://nsfa-fane.ca/wp-content/uploads/2017/07/Statistical-Profile-of-Queens-County.pdf>

Nova Scotia Open Data Portal. 2020. Traffic Volumes – Provincial Highway System. <https://data.novascotia.ca/Roads-Driving-and-Transport/Traffic-Volumes-Provincial-Highway-System/8524-ec3n>. Accessed August 2022.

Parks Nova Scotia. 2016. Thomas Raddall. <https://parks.novascotia.ca/park/thomas-raddall>

Pulsifer, M. 2022. An assessment for mammals and herptofauna at a proposed quarry expansion near Granite Villae, Nova Scotia. Edgewood Environmental Services. June 15, 2022.

Randall, J. and H.G. Broders. 2014. Identification and characterization of swarming sites used by bats in Nova Scotia, Canada. *Acta Chiropterologica* 16: 109-116.

Region of Queens Municipality. 2022. <https://www.regionofqueens.com/>

Rousseu, F. and B. Drolet. 2015. Prediction of the nesting phenology of birds in Canada. In: J. Hussell and D. Lepage. 2015. Bird Nesting Calendar Query Tool. Project NestWatch. Bird Studies Canada / Études d'Oiseaux Canada. <https://www.birdscanada.org/apps/rnest/index.jsp>

Statistics Canada. 2022. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released August 17, 2022. <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E> (accessed September 1, 2022).

Stea, R. R., Conley, H., & Brown, Y. 1992. Surficial Geology Map of the Province of Nova Scotia, scale 1: 500000, digital version of Nova Scotia Department of Natural Resources Map ME 2000-1 compiled by BE Fisher and JC Poole. Scale, 1, 500000.

Southwest Nova Biosphere Reserve (SNBR). 2020. Your Biosphere. Frequently Asked Questions. <http://swnovabiosphere.ca/your-biosphere/>

Webb, K.T., and Marshall, L.B. 1999. Ecoregions and ecodistricts of Nova Scotia. Crops and Livestock Research Center, Research Branch, Agriculture and Agri-Food Canada, Truro, Nova Scotia; Indicators and Assessment Office, Environmental Quality Branch, Environment Canada, Hull Quebec.

Williams, J. 2018. Independent Review of Forest Practices in Nova Scotia – Addendum. Section 21: Market Access. https://novascotia.ca/natr/forestry/Forest_Review/FP_Addendum.pdf

11 LIMITING CONDITIONS

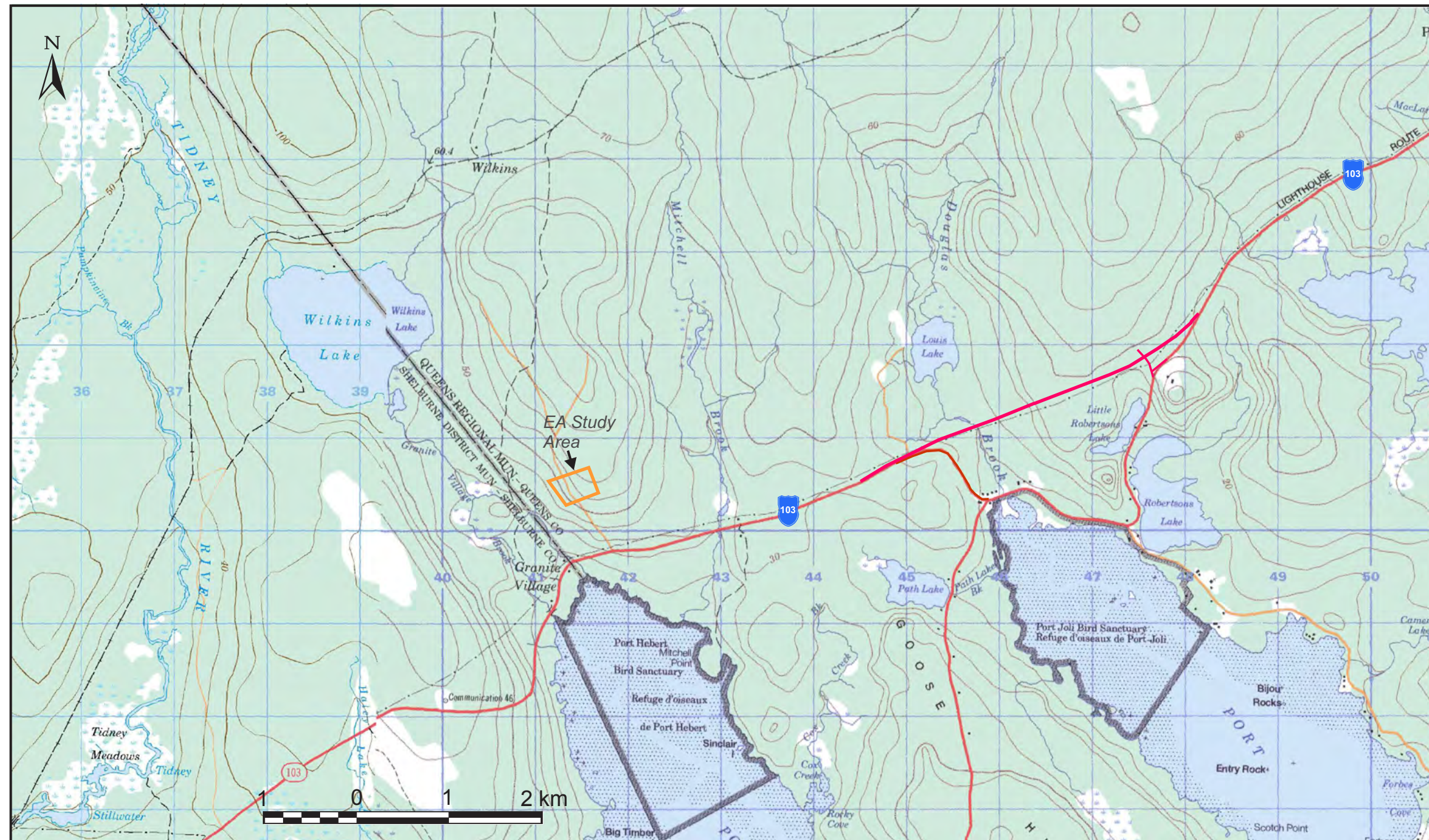
The American Society for Testing and Materials Standards of Practice and the Canadian Standards Association state that no environmental assessment can wholly eliminate uncertainty regarding the recognition of potential environmental liabilities. The intent of the assessment is to reduce, but not eliminate, uncertainty regarding projects, giving reasonable limits of time and costs.

The conclusions of this report are based in part on the information provided by others, which is assumed to be correct. The potential exists that unexpected environmental conditions may be encountered at the site and with the project, not specifically investigated. Should this occur, the proponent and regulatory authorities must be notified so that we may decide if modifications to our conclusions are necessary.

The findings of this investigation are based on research and investigations carried out in October 2021 – October 2022 and the generally accepted assessment practices of our industry. No other warranty is made.

APPENDIX A

MAPS



**THE MUNICIPAL GROUP
OF COMPANIES**

**DEXTER CONSTRUCTION
COMPANY LTD.**

**GRANITE VILLAGE QUARRY
EXPANSION**

**Queens County,
Nova Scotia**

**Site Location and
Features**

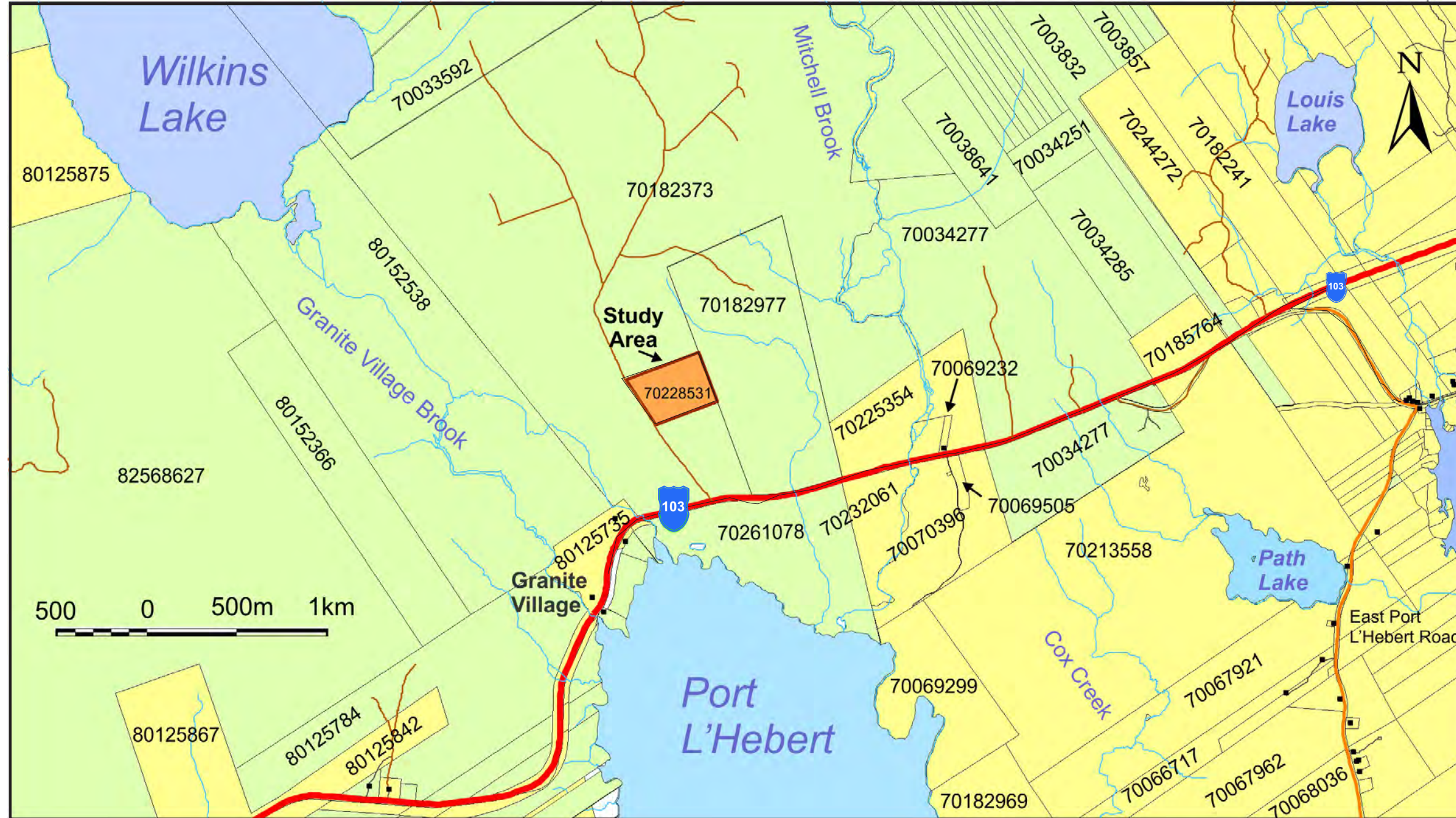
 EA Study Area

Mapping by:
Envirosphere Consultants Ltd.
Windsor, Nova Scotia
July 2022

Base Map: NTS 1:50,000
20 P14 & 20 P15



Map A-1



THE MUNICIPAL GROUP OF COMPANIES

DEXTER CONSTRUCTION COMPANY LTD.

GRANITE VILLAGE QUARRY EXPANSION

Queens County, Nova Scotia

Property Ownership

- Crown Land
- Quarry Property
- Property Boundaries
- Major Roads
- 50209980 Property Identification Number (PID)
- Building

Mapping by:
 Envirosphere Consultants Ltd.
 Windsor, Nova Scotia
 July 2022

Property Mapping: Province of
 Nova Scotia, Updated March 2022



Map A-2



THE MUNICIPAL GROUP OF COMPANIES

DEXTER CONSTRUCTION COMPANY LIMITED

GRANITE VILLAGE QUARRY EXPANSION

Queens County, Nova Scotia

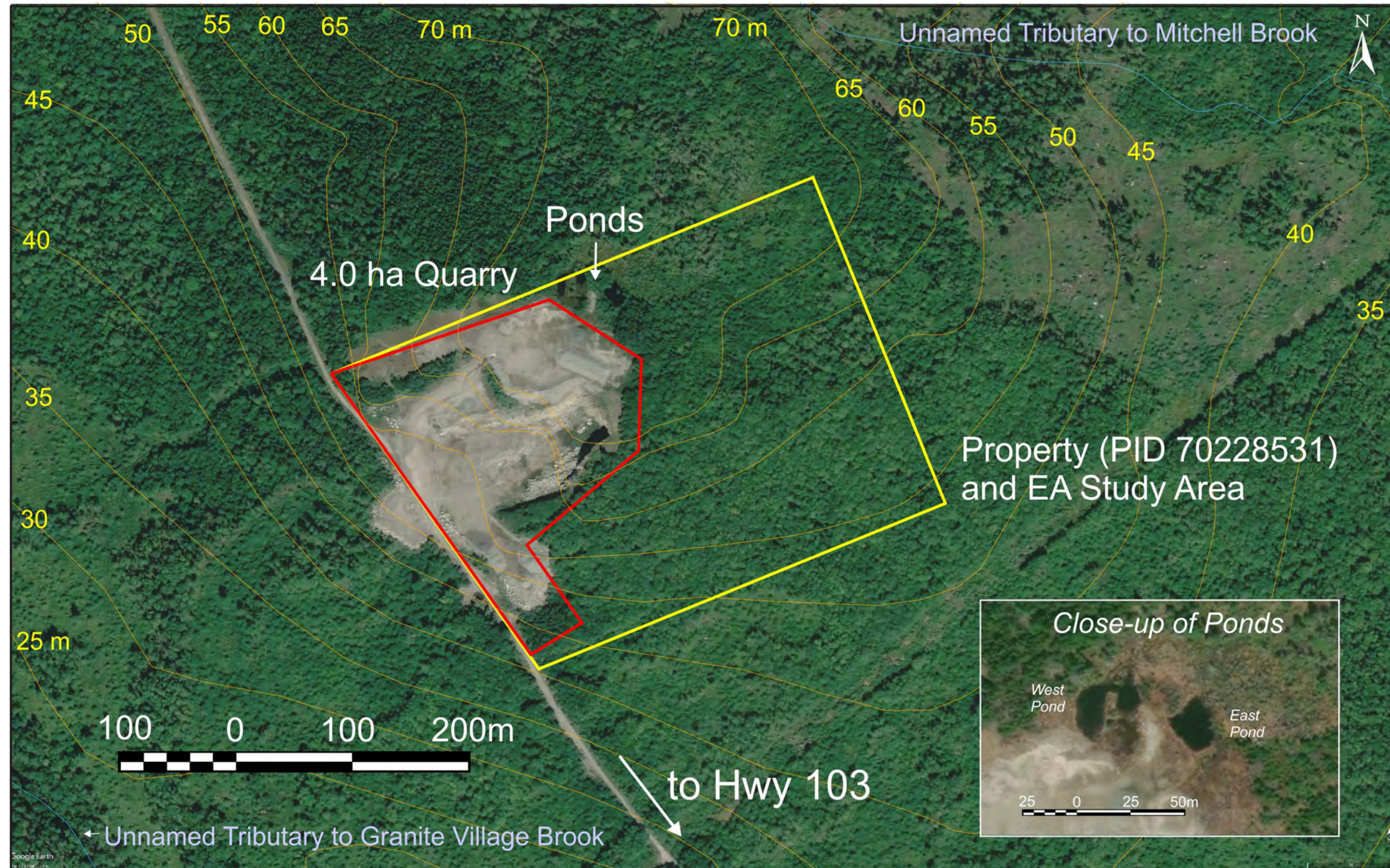
Forest Classification

-  Lake Wetland
-  Salt Marsh
-  Beaver Flowage
-  Shrub Swamp
-  Plantation
-  Alders
-  Clearcut
-  Natural Stand
-  Quarry
-  Wetlands General
-  Graminoid Marsh
-  Treated
-  Brush
-  Fen
-  Treed Bog
-  Inland Water
-  Barren
-  Watercourse
-  Main Highway
-  Trunk Highway
-  Secondary Roads & Trails

Map by:
 EnviroSphere Consultants Limited.
 Windsor, Nova Scotia, October 2022



Map A-3



**THE MUNICIPAL GROUP
OF COMPANIES**

**DEXTER CONSTRUCTION
COMPANY LIMITED**

**GRANITE VILLAGE
QUARRY EXPANSION**
Queens County,
Nova Scotia

Site Features

- Study area
- 4.0 ha Quarry
- Elevation Contour (m)
- Watercourse




Map by:
Envirosphere Consultants Limited.
Windsor, Nova Scotia, November 2022

Map A-4

APPENDIX B

BOTANICAL SURVEYS

Fall 2020 & Spring/Early Summer 2021



Spring & Fall Botanical Surveys of a Proposed Quarry Expansion in Granite Village, Shelburne County, Nova Scotia

Ruth E. Newell, B.Sc. (Hons.), M.Sc.
1-11-2023

Fall & Spring Botanical Surveys of a Proposed Quarry Expansion in Granite Village, Shelburne County, Nova Scotia

Introduction

Fall and Spring vascular plant surveys were conducted at the site of a proposed quarry expansion in Granite Village, Shelburne County, Nova Scotia, on October 19th and 20th, 2021, and June 18th and 19th, 2022 by botanist Ruth E. Newell, B.Sc. (Hons.), M.Sc. Observations from both surveys are presented in this report.

The main survey area is indicated by the solid orange line shown in Figure 1.

Primary habitats present within the survey area include highly disturbed habitat such as the open quarry areas and areas recently cleared for property access, several ponds and associated wetlands, open shrub barren with a scattered to dense tree component and boggy areas of various sizes, and deciduous woodland.

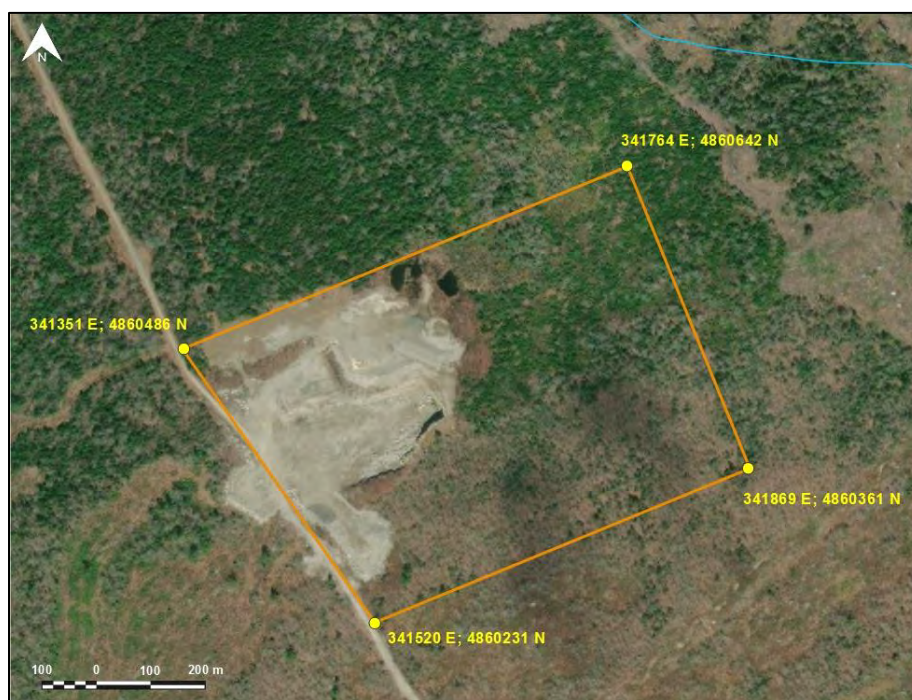


Figure 1. The delineated survey area (orange line) for the Granite Village quarry vascular plant survey.

All vascular plants observed during these surveys as well as the habitats in which they occur, and both their provincial general status rank and the Atlantic Canada Conservation Data Centre (ACDC) subnational status rank are provided in the APPENDIX located at the end of this document. Information on these status ranks including status rank definitions can be found on the Wild Species 2015, The General Status of Species in Canada website (<https://www.wildspecies.ca/>) and the Atlantic Canada Conservation Data Centre (ACDC) website (<http://www.accdc.com>).

Results

Habitat Descriptions

1) Open, highly disturbed habitat (includes quarry pit and recently cutover/grubbed barren habitat)

Vascular plants occurring in the open quarry pit (Fig. 2) consist of a mix of native and non-native, generally weedy species.

Non-native, herbaceous, vascular plant species occurring within the quarry area include Bull Thistle (*Cirsium vulgare*), Queen Anne's Lace (*Daucus carota*), Common Hemp Nettle (*Galeopsis tetrahit*), Pineapple Weed (*Matricaria discoidea*), English Plantain (*Plantago lanceolata*), Common Plantain (*Plantago major*) and Colt's-foot (*Tussilago farfara*). Native herbaceous vascular plant species present include Rough Bent Grass (*Agrostis scabra*), Bristly Sarsaparilla (*Aralia hispida*), Wild Strawberry (*Fragaria virginiana*) and Pinweed (*Lechea intermedia*).

Tree species present include Trembling Aspen (*Populus tremuloides*) and Wire Birch (*Betula populifolia*).

Vascular plant species present in the recently cutover/grubbed barren area (skidder road) (Fig. 3) northeast of the open quarry area include: Elliot's Goldenrod (*Solidago latissimifolia*), Bracken Fern (*Pteridium aquilinum*), White Birch (*Betula papyrifera*), Large-toothed Aspen (*Populus grandidentata*), Sweet Fern (*Comptonia peregrina*), Black Huckleberry (*Gaylussacia baccata*) and Canada St. John's-wort (*Hypericum canadense*).

Vascular plant species observed during both Fall and Spring surveys are listed in TABLE 1.



Figure 2. Open quarry pit.



Figure 3. Relatively recent, cutover/grubbing activity (skidder road) northeast of the open quarry pit.

Species of conservation concern:

Several plants of Bicknell's Crane Bill (*Geranium bicknellii*) were observed in a highly disturbed area near the mouth of the skidder road (43°52'49"N, 64°58'17"W) (Fig. 3) located southeast of the ponds. This species is listed as a vulnerable/YELLOW species under the Nova Scotia General Status of Plant Species program. It also has an Atlantic Canada Conservation Data Centre (ACDC) Subnational Status Rank of S3 (vulnerable).

2) Ponds and associated wetlands

At the northeast end of the active quarry area are two small ponds situated in close proximity to each other (Figs. 1, 4 & 5) plus a relatively extensive, shared wetland immediately north and northeast of the ponds. The wetland is primarily marsh habitat (Fig. 6) although the northeast (top) end, i.e., the end furthest from the ponds) transitions to more bog-like habitat (Fig. 7).

Vascular plants occurring within and adjacent to the ponds include Broad-leaved Cattail (*Typha latifolia*), Bebb's Willow (*Salix bebbiana*), Fowl Manna Grass (*Glyceria striata*), Elliot's Goldenrod (*Solidago latissimifolia*) (previously mis-identified as Rough Goldenrod/*Solidago rugosa* in the Fall report), Sensitive Fern (*Onoclea sensibilis*), Red Maple (*Acer rubrum*), alders (*Alnus alnobetula* ssp. *crispa* and *Alnus incana* ssp. *rugosa*), Cinnamon Fern (*Osmundastrum cinnamomeum*), Trembling Aspen (*Populus tremuloides*), Steeplebush (*Spiraea tomentosa*), Soft Rush (*Juncus effusus*), Common Woolly Bulrush (*Scirpus cyperinus*), etc.

Vascular plants occurring in marsh habitat adjacent to and northeast of the two ponds include Fowl Manna Grass (*Glyceria striata*), Crested Wood Fern (*Dryopteris cristata*), Spinulose Wood Fern (*Dryopteris carthusiana*), White Meadowsweet (*Spiraea alba* var. *latifolia*), a cottongrass (*Eriophorum* sp.), Soft Rush (*Juncus effusus*), Sweet Gale (*Myrica gale*) and Large Cranberry (*Vaccinium macrocarpon*).

Vascular plant species present at the far end of the wetland include Labrador-tea (*Rhododendron groenlandicum*), Bayberry (*Morella pensylvanica*), Canada Holly (*Ilex verticillata*), Sheep Laurel (*Kalmia angustifolia*), Large Cranberry (*Vaccinium macrocarpon*) and Bog Aster (*Oclemena nemoralis*). Sphagnum mosses (*Sphagnum* spp.) are also more prevalent in this section of the wetland.



Figure 4. The smaller of the two ponds at the northeast end of the quarry pit. Cattails (*Typha* sp.) are dominant in both ponds.



Figure 5. A section of the larger of the two ponds at the northeast end of the quarry. Cattails have filled in this section of the pond leaving little open water.



Figure 6. A photo of the marsh in the vicinity of the larger pond. Bulrushes (*Scirpus* spp.) are dominant at this location.



Figure 7. The northeast end of the wetland associated with the two ponds. The wetland at this location is boggy in nature.

Species of conservation concern:

Sharp Fruit Rush (*Juncus acuminatus*) was located at one location in marsh habitat near the northeast end of the larger of the two ponds (43°52' 51"N, 64°58'19"W).

This species has a general status rank of S3S4/vulnerable (yellow) to apparently secure (light green) and an Atlantic Canada Conservation Data Centre (ACCDC) Subnational Status Rank of vulnerable to apparently secure (S3S4).

Although only one clump of this species was observed at the time of the fall survey, it is considered likely that more plants are present within and adjacent to the general area of the two ponds.

3) Shrub barrens with scattered boggy habitat

The top half of the property (northeast of the quarry, ponds, and associated wetlands) appears to be primarily open, shrub barren, with Black Huckleberry (*Gaylussacia baccata*) the dominant shrub species (Fig. 8). There is a significant young (10-25 years old) tree component present including Red Maple (*Acer rubrum*), White Pine (*Pinus strobus*), Red Spruce (*Picea rubens*), Red Oak (*Quercus rubra*) and Balsam Fir (*Abies balsamea*). Other plant species present within this barren habitat include Bracken Fern (*Pteridium aquilinum*), Bunchberry (*Cornus canadensis*), Northern Bayberry (*Morella pensylvanica*) and Wild Sarsaparilla (*Aralia nudicaulis*).

Also present within the shrub barren are scattered boggy openings (Fig. 9) of various sizes. Species occurring within these wet areas include sphagnum mosses (*Sphagnum* spp.), Cinnamon Fern (*Osmundastrum cinnamomeum*), Labrador-tea (*Rhododendron groenlandicum*), Common Woolly Bulrush (*Scirpus cyperinus*), Bristly Dewberry (*Rubus hispidus*), Sheep Laurel (*Kalmia angustifolia*), Three-seeded Sedge (*Carex trisperma*), White Meadowsweet (*Spiraea alba* var. *latifolia*), etc.



Figure 8. Shrub barren habitat with Black Huckleberry (*Gaylussacia baccata*) plus scattered trees including Balsam Fir (*Abies balsamea*), Red Oak (*Quercus rubra*) and White Birch (*Betula papyrifera*).



Figure 9. One of many small boggy areas occurring within the shrub barren located at the north corner of the quarry property. Species present within this habitat include sphagnum mosses (*Sphagnum* spp.), Large Cranberry (*Vaccinium macrocarpon*), Cinnamon Fern (*Osmundastrum cinnamomeum*), Black Spruce (*Picea mariana*) and Red Maple (*Acer rubrum*).

Species of conservation concern:

There were no vascular plant species of conservation concern observed in these habitats during this survey.

4) Deciduous woodland



Figure 10. Primarily deciduous woodland occurring along the southeast side of the quarry property.

Primarily deciduous woodland (Figs. 10 & 11) occurs along the southeast side of the quarry property. Tree species present include Red Oak (*Quercus rubra*), Red maple (*Acer rubrum*), Moose Maple (*Acer pensylvanicum*), White Birch (*Betula papyrifera*), Red Spruce (*Picea rubens*) and Balsam Fir (*Abies balsamea*). Shrubs are abundant within this habitat and include American Witch-hazel (*Hamamelis virginiana*), Black Huckleberry (*Gaylussacia baccata*), Sheep laurel (*Kalmia angustifolia*), Witherod (*Viburnum nudum* var. *cassinoides*), Common Winterberry (*Ilex verticillata*) and Northern Bayberry (*Morella pensylvanica*).

Herbaceous vascular plant species present include Wild Sarsaparilla (*Aralia nudicaulis*), Bunchberry (*Cornus canadensis*), Mayflower (*Epigaea repens*), Eastern Teaberry (*Gaultheria procumbens*), Cinnamon Fern (*Osmundastrum cinnamomeum*) and Bracken Fern (*Pteridium aquilinum*).

Also present within this habitat/area are scattered large boulders (Fig. 11).



Figure 11. Deciduous woodland showing one of the many large boulders scattered throughout this habitat

Species of conservation concern:

There were no vascular plant species of conservation concern observed in this habitat during this survey.

Discussion

No vascular plant species listed under either federal species-at-risk legislation or provincial species-at-risk-legislation were observed on the Granite Village quarry property during this survey.

All the vascular plant species observed and recorded during this current survey (with two exceptions) fall into the Nova Scotia general status rank categories of **GREEN, LIGHT GREEN, LIGHT GREEN TO GREEN** or **EXOTIC** with GREEN indicating a plant with a secure conservation status within the province, LIGHT GREEN indicating a species that is at a fairly low risk of extirpation within the province and EXOTIC meaning a species that is non-native to Nova Scotia.

The Atlantic Canada Conservation Data Centre subnational status ranks (with two exceptions) all fall into the categories of S5, S4, S4S5 or SNA, also indicating that all species documented on site during this survey, are not of conservation concern (S5 = **Secure** - Common, widespread, and abundant in the province; S4 = **Apparently Secure** - uncommon but not rare; some cause for long-term concern due to declines or other factors; S4S5 = a status rank ranging from **Apparently Secure to Secure**; SNA = **Not**

Applicable - a conservation status rank is not applicable because the species is not a suitable target for conservation activities a for example, non-native (exotic) species.

Several plants of Bicknell's Crane Bill (*Geranium bicknellii*) were observed in a highly disturbed area (skidder trail) (Fig. 3) located southeast of the ponds. This species is listed as a vulnerable/YELLOW species under the Nova Scotia General Status of Plant Species program. It also has an Atlantic Canada Conservation Data Centre (ACCDC) Subnational Status Rank of S3 (vulnerable).

Sharp Fruit Rush (*Juncus acuminatus*) was located near the larger pond in wetland habitat (marsh). This species was only observed at this one location, but it is considered likely to be present at other locations in the vicinity of the two ponds. It has a general status rank of S3S4/vulnerable (yellow) to apparently secure (light green) and an Atlantic Canada Conservation Data Centre (ACCDC) Subnational Status Rank of vulnerable to apparently secure (S3S4).

Species listed in the APPENDIX not identified to species are not expected to be of conservation concern.

APPENDIX

List of all vascular plant species observed on the Granite Village quarry property during surveys conducted on October 19 & 20, 2021 and June 18th and 19th, 2022, the habitats in which they were found and their status ranks (both the Nova Scotia General Status Rank* and the Atlantic Canada Conservation Data Centre Subnational s-rank** are provided for each species). Habitats present on site include open disturbed areas such as the open quarry footprint (Q) and recently cutover/disturbed barren habitat (DB), several ponds and associated wetlands (W), barrens and associated scattered, boggy areas (B) and relatively undisturbed, deciduous woodland (DW).

Latin Name	Common Name	Nova Scotia General Status Rank*	ACCDC Subnational Status Rank**	Habitat(s)
<i>Abies balsamea</i>	Balsam Fir	S5/secure (green)	S5/secure	B, DW, W
<i>Acer pensylvanicum</i>	Moose Maple	S5/secure (green)	S5/secure	DW
<i>Acer rubrum</i>	Red Maple	S5/secure (green)	S5/secure	B, DW, W
<i>Agrostis scabra</i>	Rough Bent Grass	S5/secure (green)	S5/secure	Q
<i>Alnus alnobetula ssp. crispa</i>	Mountain Alder	S5/secure (green)	S5/secure	Q, W
<i>Alnus incana ssp. rugosa</i>	Speckled Alder	S5/secure (green)	S5/secure	B, W
<i>Anaphalis margaritacea</i>	Pearly Everlasting	S5/secure (green)	S5/secure	Q, W
<i>Aralia hispida</i>	Bristly Sarsaparilla	S5/secure (green)	S5/secure	DB, Q
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	S5/secure (green)	S5/secure	B, DW
<i>Betula alleghaniensis</i>	Yellow Birch	S5/secure (green)	S5/secure	DW, MW
<i>Betula papyrifera</i>	White Birch	S5/secure (green)	S5/secure	B, DB, DW, Q
<i>Betula populifolia</i>	Wire birch	S5/secure (green)	S5/secure	Q
<i>Bulbostylis capillaris</i>	Dense-tufted Hair sedge	NA/exotic	SNA	Q

Latin Name	Common Name	Nova Scotia General Status Rank*	ACCDC Subnational Status Rank**	Habitat(s)
<i>Carex bullata</i>	Button Sedge	S4/apparently secure (light green)	S4/apparently secure	W
<i>Carex cumulata</i>	Dense sedge	S4/apparently secure (light green)	S4S5/apparently secure to secure (light green to green)	Q
<i>Carex trisperma</i>	Three-seeded Sedge	S5/secure (green)	S5/secure	B
<i>Carex umbellata</i>	Umbellate Sedge	S4/apparently secure (light green)	S4/apparently secure	Q
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	Common Chickweed	NA/exotic	SNA	Q
<i>Cirsium vulgare</i>	Bull Thistle	NA/exotic	SNA	Q
<i>Comptonia peregrina</i>	Sweet-fern	S5/secure (green)	S5/secure	Q, DB, W
<i>Cornus canadensis</i>	Bunchberry	S5/secure (green)	S5/secure	B, DW, W
<i>Cypripedium acaule</i>	Pink Lady's-slipper	S5/secure (green)	S5/secure	DW
<i>Daucus carota</i>	Queen Anne's Lace	NA/exotic	SNA	Q
<i>Dichanthelium implicatum</i>	Slender-stemmed Panic Grass	S5/secure (green)	S5/secure	Q
<i>Doellingeria umbellata</i>	Tall White Aster	S5/secure (green)	S5/secure	B, Q, W
<i>Dryopteris cristata</i>	Crested Wood Fern	S5/secure (green)	S5/secure	B, W
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	S5/secure (green)	S5/secure	W
<i>Epigaea repens</i>	Mayflower	S5/secure (green)	S5/secure	B, DW
<i>Equisetum arvense</i>	Field Horsetail	S5/secure (green)	S5/secure	Q, W
<i>Erigeron</i> sp.	a fleabane	-	-	Q, W
<i>Eriophorum</i> sp.	a cottongrass	-	-	B
<i>Eriophorum virginicum</i>	Tawny Cottongrass	S5/secure (green)	S5/secure	W
<i>Eupatorium perfoliatum</i>	Boneset	S5/secure (green)	S5/secure	W
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5/secure (green)	S5/secure	Q, W
<i>Fragaria virginiana</i>	Wild Strawberry	S5/secure (green)	S5/secure	Q
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	NA/exotic	SNA	Q
<i>Gaultheria hispidula</i>	Creeping Snowberry	S5/secure (green)	S5/secure	B, W
<i>Gaultheria procumbens</i>	Eastern Teaberry	S5/secure (green)	S5/secure	B, DW
<i>Gaylussacia baccata</i>	Black Huckleberry	S5/secure (green)	S5/secure	B, DB, DW, W
<i>Geranium bicknellii</i>	Bicknell's Crane's-bill	S3/vulnerable (yellow)	S3/vulnerable	DB
<i>Glyceria striata</i>	Fowl Manna Grass	S5/secure (green)	S5/secure	W
<i>Gnaphalium uliginosum</i>	Marsh Cudweed	NA/exotic	SNA	Q

Latin Name	Common Name	Nova Scotia General Status Rank*	ACCDC Subnational Status Rank**	Habitat(s)
<i>Hamamelis virginiana</i>	American Witch-hazel	S5/secure (green)	S5/secure	DW
<i>Hieracium piloselloides</i>	Glaucous Hawkweed	NA/exotic	SNA	Q
<i>Hypericum canadense</i>	Canada St. John's-wort	S5/secure (green)	S5/secure	DB, Q
<i>Hypericum gentianoides</i>	False St. John's-wort	NA/exotic	SNA	Q
<i>Hypericum perforatum</i>	Common St. John's-wort	NA/exotic	SNA	Q
<i>Ilex glabra</i>	Inkberry	S5/secure (green)	S5/secure	B
<i>Ilex mucronata</i>	Mountain Holly	S5/secure (green)	S5/secure	B, DW, W
<i>Ilex verticillata</i>	Common Winterberry	S5/secure (green)	S5/secure	B, DW, W
<i>Juncus acuminatus</i>	Sharp-fruit Rush	S3S4/vulnerable (yellow) to apparently secure (light green)	S3S4/vulnerable to apparently secure	W
<i>Juncus effusus</i>	Soft Rush	S5/secure (green)	S5/secure	W
<i>Juncus tenuis</i>	Slender Rush	S5/secure (green)	S5/secure	Q
<i>Kalmia angustifolia</i>	Sheep Laurel	S5/secure (green)	S5/secure	B, DB, DW, W
<i>Kalmia polifolia</i>	Pale Bog Laurel	S5/secure (green)	S5/secure	B
<i>Larix laricina</i> *	Larch	S5/secure (green)	S5/secure	B
<i>Lechea intermedia</i>	Pinweed	S4/apparently secure (light green)	S4/apparently secure	Q, DB
<i>Leucanthemum vulgare</i> *	Ox-eye Daisy	NA/exotic	SNA	Q
<i>Linaria repens</i> *	Striped Toadflax	NA/exotic	SNA	Q
<i>Linnaea borealis</i>	Twinflower	S5/secure (green)	S5/secure	W
<i>Lysimachia borealis</i>	Northern Starflower	S5/secure (green)	S5/secure	DW
<i>Maianthemum canadense</i>	Wild Lily-of-the-valley	S5/secure (green)	S5/secure	DW
<i>Matricaria discoidea</i>	Pineapple Weed	NA/exotic	SNA	Q
<i>Medeola virginiana</i> *	Cucumber-root	S5/secure (green)	S5/secure	DW
<i>Mitchella repens</i>	Partridgeberry	S5/secure (green)	S5/secure	B, DW
<i>Monotropa uniflora</i>	Indian Pipe	S5/secure (green)	S5/secure	DW
<i>Morella pensylvanica</i>	Northern Bayberry	S5/secure (green)	S5/secure	B, DW, W
<i>Myrica gale</i>	Sweet Gale	S5/secure (green)	S5/secure	W
<i>Nabalus sp.</i>	a rattlesnakeroot	-	-	DW
<i>Nuttallanthus canadensis</i>	Canada Toadflax	NA/exotic	SNA	Q
<i>Oclemena acuminata</i> *	Whorled Wood Aster	S5/secure (green)	S5/secure	B, DW
<i>Oclemena nemoralis</i>	Bog Aster	S5/secure (green)	S5/secure	W
<i>Oenothera biennis</i> *	Common Evening Primrose	S5/secure (green)	S5/secure	Q
<i>Onoclea sensibilis</i>	Sensitive Fern	S5/secure (green)	S5/secure	W
<i>Osmundastrum cinnamomeum</i>	Cinnamon Fern	S5/secure (green)	S5/secure	B, DW, W

Latin Name	Common Name	Nova Scotia General Status Rank*	ACCDC Subnational Status Rank**	Habitat(s)
<i>Parathypteris noveboracensis</i>	New York Fern	S5/secure (green)	S5/secure	DW
<i>Picea glauca</i>	White Spruce	S5/secure (green)	S5/secure	DW
<i>Picea mariana</i> *	Black Spruce	S5/secure (green)	S5/secure	B
<i>Picea rubens</i>	Red Spruce	S5/secure (green)	S5/secure	B, DW
<i>Pinus strobus</i>	White Pine	S5/secure (green)	S5/secure	B, DW
<i>Plantago lanceolata</i>	English Plantain	NA/exotic	SNA	Q
<i>Plantago major</i> *	Common Plantain	SNA/exotic	SNA	Q
<i>Poa compressa</i>	Canada Bluegrass	SNA/exotic	SNA	Q
<i>Populus grandidentata</i>	Large-toothed Aspen	S5/secure (green)	S5/secure	DB, Q, W
<i>Populus tremuloides</i>	Trembling Aspen	S5/secure (green)	S5/secure	Q, W
<i>Potentilla sp.</i>	a cinquefoil	-	-	Q
<i>Prunus serotina</i>	Black Cherry	S5/secure (green)	S5/secure	Q
<i>Peridium aquilinum</i>	Bracken Fern	S5/secure (green)	S5/secure	B, DB, DW, Q
<i>Quercus rubra</i>	Northern Red Oak	S5/secure (green)	S5/secure	B, DW
<i>Rhododendron canadense</i> *	Rhodora	S5/secure (green)	S5/secure	B, Q
<i>Rhododendron groenlandicum</i>	Labrador Tea	S5/secure (green)	S5	B, W
<i>Rubus idaeus ssp. strigosus</i>	Wild Raspberry	S5/secure (green)	S5	Q, W
<i>Rubus hispida</i>	Bristly Dewberry	S5/secure (green)	S5	B
<i>Rubus sp.</i>	a blackberry	-	-	B, Q, W
<i>Salix bebbiana</i>	Bebb's Willow	S5/secure (green)	S5	W
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	S5/secure (green)	S5/secure	B, W
<i>Scirpus sp.</i>	a bulrush	-	-	W
<i>Solidago latissimifolia</i>	Elliot's Goldenrod	S3S4/vulnerable (yellow) to apparently secure (light green)	S4/apparently secure	B, DB, W
<i>Sparganium sp. (non-flowering)</i>	a bur-reed	-	-	W
<i>Spiraea alba var. latifolia</i>	White Meadowsweet	S5/secure (green)	S5/secure	B, W
<i>Spiraea tomentosa</i>	Steeplebush	S5/secure (green)	S5/secure	W
<i>Trifolium arvense</i>	Rabbit's-foot Clover	NA/exotic	SNA	Q
<i>Trifolium hybridum</i>	Alsike Clover	NA/exotic	SNA	Q
<i>Trifolium repens</i>	White Clover	NA/exotic	SNA	Q
<i>Tussilago farfara</i>	Colts-foot	NA/exotic	SNA	Q
<i>Typha latifolia</i>	Broad-leaved Cattail	S5/secure (green)	S5/secure	W
<i>Vaccinium angustifolium</i> *	Lowbush Blueberry	S5/secure (green)	S5/secure	B
<i>Vaccinium macrocarpon</i>	Large cranberry	S5/secure (green)	S5/secure	B, W
<i>Vaccinium myrtilloides</i>	Velvet-leaved Blueberry	S5/secure (green)	S5/secure	B

Latin Name	Common Name	Nova Scotia General Status Rank*	ACCDC Subnational Status Rank**	Habitat(s)
<i>Veronica officinalis</i> *	Common Speedwell	NA/exotic	SNA	Q
<i>Viburnum nudum</i> var. <i>cassinoides</i>	Witherod	S5/secure (green)	S5/secure	B, DW, Q
<i>Viola lanceolata</i>	Lance-leaved Violet	S5/secure (green)	S5/secure	Q

*The Nova Scotia general status ranks used in this report are based on the ranks used in the 2015 Wild Species of Canada Report (available at <https://www.wildspecies.ca/>) ; **S5 = Secure/green** (at very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats; **S4 = Apparently secure/light green** (at a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors; **S3 = Vulnerable/yellow** (at moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors; **S2 = Imperilled/orange** (at high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors); **SNA = not applicable** (non-native/exotic).

ACCDC: Atlantic Canada Conservation Data Centre explanation of status ranks used in this report (<http://accdc.com/en/rank-definitions.html>): **S5 = Secure (common, widespread, and abundant in the province); **S4 = Apparently Secure** (uncommon but not rare; some cause for long-term concern due to declines or other factors); **S3 = Vulnerable** (Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.); **S2 = Imperilled** (imperilled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province. **SNA = Not Applicable** - a conservation status rank is not applicable because the species is not a suitable target for conservation activities, e.g., a non-native species.

APPENDIX C

MAMMAL AND WILDLIFE SURVEY


May 2022



15 JUNE 2022

AN ASSESSMENT FOR MAMMALS AND
HERPETOFAUNA AT A PROPOSED QUARRY
EXPANSION NEAR GRANITE VILLAGE,
NOVA SCOTIA

MARK PULSIFER MSC
EDGEWOOD ENVIRONMENTAL SERVICES
Antigonish, Nova Scotia



An Assessment for Mammals and Herpetofauna at a Proposed Quarry Expansion Near Granite Village, Nova Scotia

1.0 Introduction and Background

Edgewood Environmental Services was subcontracted by Envirosphere Consultants Ltd. to complete a preliminary assessment for mammals and amphibians to provide background information for an application by Dexter Construction Ltd. for an expansion of their Port Joli (Granite Village) Quarry (Figure 1; UTM 20T 341650E 4860437N). The assessment area was approximately 8 ha and consisted primarily of a variable age forest matrix with a small wetland complex along the northern boundary of the property.

Various legislation in Nova Scotia protects wildlife, and biodiversity in general. The Nova Scotia Wildlife Act (1989), Species at Risk Act (1998), and Biodiversity Act (2021) protects species and habitats within the province from adverse impacts. The results of this survey will be used (in part) to address possible mitigation strategies for wildlife in general that may arise as a result of the quarry expansion, and specifically for any species at risk or species of conservation concern.



Figure 1. 2012 Google Earth image of the Port Joli Quarry expansion area outlined in red. Numbered photo waypoints correspond with images found in the results section of this report.

Potential impacts on all biodiversity are noteworthy; however, potential impacts on “species at risk” (SAR) or “species of conservation concern” (SCC) take priority because of their conservation status and potential vulnerability to human activities. In Nova Scotia the responsibility for

conservation of SAR is jointly shared by the Nova Scotia Department of Natural Resources and Renewables under the provincial Endangered Species Act (NSES), and by Environment and Climate Change Canada under the federal Species at Risk Act (SARA). Both jurisdictions maintain a listing of species prioritized by level of threat. The conservation status for a species is informed in part by population data supplied by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the Atlantic Canada Conservation Data Center (AC CDC), and the General Status of Wild Species in Canada.

The Port Joli Quarry study area lies within and adjacent to a complex of conservation areas associated with the South Shore Important Bird Area (IBA), Port L’Hebert Provincial Park, Port L’Hebert Bird Sanctuary, and Port Joli Conservation Lands.

The Atlantic Canada Conservation Data Center (AC CDC) records (May 2022) for the area surrounding the Port Joli Quarry study area show only one mammalian, or herpetofauna species at risk or conservation concern within a 5 km radius of the study area. Records indicate that provincially endangered moose (*Alces alces americana*) have been reported within 2.3 km of the center of the study area. The Port Joli Quarry study area is located within a provincial moose concentration area; however; it does not fall within designated core moose habitat identified in the Recovery Plan for Moose (*Alces alces americana*) in Mainland Nova Scotia (NSDRR 2021).

The provincially and federally endangered Little Brown Myotis (*Myotis lucifugus*) has been reported within a 10 km radius of the quarry. Similarly, there are records of provincially threatened Eastern ribbonsnake (*Thamnophis saurita*) within 7 km, and vulnerable snapping turtle (*Chelydra serpentina*) within 10 km of the study area. For a complete list of AC CDC records for rare and uncommon mammals and herpetofauna within a 100 km radius of the study area see Table 1.

2.0. Methodology

Walkover surveys for mammals and herpetofauna were conducted throughout the survey area identified in red in Figure 1 prior to full leaf-out. All surveys were conducted by a single observer and were designed to intersect major habitats, or follow existing roads or trails within the study area. Because this was a reconnaissance survey, effort was not standardized. Observations within forest habitat were made along indeterminate survey routes. Surveys on grubbed trails involved scanning the entire trail width between start and stop points. Evidence of species occurrence was confirmed by visual observation of individuals or egg masses, or indirect evidence such as calls, scat, tracks, dens, and foraging behaviours (i.e., grubbing, rock and log rolling, browse, seed middens). Amphibian surveys were more focused in wetland habitats and generally required more search effort. Reference waypoints for points of interest and photos were recorded using a Garmin Oregon 750t[®] GPS, and all photos were recorded with an Apple iPhone 11[®].



3.0. Results

All surveys were completed on 18 May 2022 between 1100 hrs and 1300 hrs. Environmental conditions for the survey were favourable with light winds, predominantly sunny skies, no precipitation, and air temperature was 17° C. Approximately 1.6 km of walkover surveys within predominant habitat types were completed in the study area (Figure 2).

Figure 2. Garmin BaseCamp image of track log for Port Joli Quarry mammal and herpetofauna walk-over surveys on 18 May 2022.

AC CDC Records for Species at Risk and Species of Conservation Concern Within 100 km of the Center of the Study Area						
Common Name	Scientific Name	COSEWIC Status	SARA Status	Provincial Status	Provincial S-Ranks	Closest Distance to Center of Study Area (Km)
Little Brown Myotis	<i>Myotis lucifugus</i>	Endangered	Endangered	Endangered	S1	8
Northern Myotis	<i>Myotis septentrionalis</i>	Endangered	Endangered	Endangered	S1	29
Tricolored Bat	<i>Perimyotis subflavus</i>	Endangered	Endangered	Endangered	S1	27
Canada Lynx	<i>Lynx canadensis</i>	Not at Risk		Endangered	S2/S3	65
American Marten	<i>Martes americana</i>			Endangered	S2/S3	24
Moose	<i>Alces alces americana</i>			Endangered	S1	2
Fisher	<i>Pekania pennanti</i>				S3	32
Southern Flying Squirrel	<i>Glaucomys volans</i>	Not at Risk			S3/S4	56
Blanding's Turtle	<i>Emydoidea blandingii</i>	Endangered	Endangered	Endangered	S1	26
Eastern Ribbonsnake	<i>Thamnophis saurita</i>	Threatened	Threatened	Threatened	S2/S3	7
Wood Turtle	<i>Glyptemys insculpta</i>	Threatened	Threatened	Threatened	S2	27
Snapping Turtle	<i>Chelydra serpentina</i>	Special Concern	Special Concern	Vulnerable	S3	8
Eastern Painted Turtle	<i>Chrysemys picta</i>	Special Concern	Special Concern		S4	27
Four-toed Salamander	<i>Hemidactylium scutatum</i>	Not at Risk			S3	9

Table 1. May 2022 AC CDC records for SAR and SCC within 100 km of the center of the study area. Distances were rounded down to a whole integer. Blank cells indicate that there was no conservation status reported by AC CDC.

Surveys resulted in the identification of four mammal species and one amphibian species (Table 2). No reptiles were observed to be present.

Species Observed Directly or Indirectly During Walk-over Survey of Port Joli Quarry Proposed Expansion Area		
Common Name	Scientific Name	Type of Sign
White-tail Deer	<i>Odocoileus virginianus</i>	Pellets, tracks
Snowshoe Hare	<i>Lepus americanus</i>	Pellets
Eastern Coyote	<i>Canis latrans</i>	Scat
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	Seed middens
Bullfrog	<i>Lithobates catesbeianus</i>	Sighting

Table 2. Mammal and herpetofauna species identified in the study area during walk-over surveys on 18 May 2022 at Port Joli Quarry.

4.0 Representative Habitats and Species

4.1 General Habitat Description

The Port Joli Quarry expansion study area includes approximately 8 ha of forest cover and wetlands. General forest cover consists of hardwood dominated stands of red oak (*Quercus rubra*) and red maple (*Acer rubrum*) with regenerating balsam fir (*Abies balsamea*) and dogwood (*Viburnum sp.*) dominating the understory (Figures 3 a, b; Photo waypoints 148, 149) in the southern portion of the study area; and regenerating mixedwood stands of balsam fir,

white pine (*Pinus strobus*), white birch (*Betula papyrifera*), red spruce (*Picea rubens*), and red maple in the northern portion (Figures 4 a, b; Photo waypoints 151, 155).

Aquatic habitats consisted of a small brook (Figure 5 a), and two wetlands located along the northern boundary of the study area (Figures 5 b and c). The brook had ≤ 10 cm of water flowing through rocky substrate and may be ephemeral. The wetlands consisted of a small open water pond (Figure 5 b) and a bog dominated by trees and shrubs (Figure 5 c). The pond was ≥ 30 cm deep except near the shoreline. Several small diameter (≤ 20 cm dbh) snag trees were scattered throughout the bog, and occasional large diameter (≥ 40 -50 cm dbh) white pine snag was also present on higher elevations. Scattered mature white pine and red spruce were present along the northern boundary of the study area.

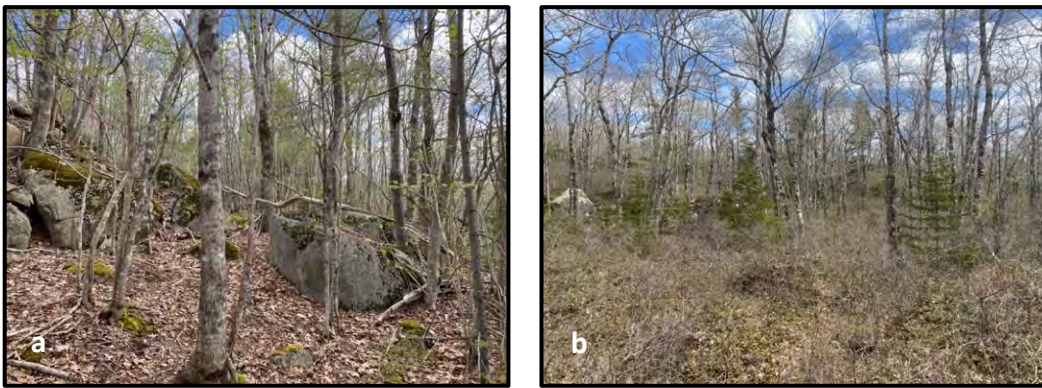


Figure 3 a, b. Typical forest cover at photo waypoints 148 and 149 respectively, representative of the southern portion of the study area. Red oak and red maple were the dominant hardwood species with balsam fir regeneration and *Viburnum* undergrowth.



Figure 4 a, b. Typical forest cover at photo waypoints 151 and 155 respectively, representative of the northern portion of the study area. Young regenerating mixedwood consisting of balsam fir, white pine, white birch, red spruce and red maple with ericaceous undergrowth. Figure 4 b had conspicuous trails, likely created and maintained by mammals such as white-tail deer and eastern coyote.



Figure 5 a, b, c. Aquatic habitats found in the Port Joli Quarry study area on 18 May 2022. Figure 5 a (Photo waypoint 149) is a small drainage, 5 b (Photo waypoint 152) is a small pond at the northern boundary of the property, and 5 c (Photo waypoint 153) is a treed-shrub bog adjacent to the pond.

Figures 3, 4, and 5 represent various early to late seral stage woodland and wetland habitats that likely support a variety of terrestrial vertebrate species. By their nature, both mammals and amphibians tend to be nocturnal and therefore less conspicuous. Consequently, their presence is often indicated by indirect sign (scat, tracks, calls, prey remains etc.) or inferred by habitat availability. Based on the type of habitats present at the study site, there may be a broad range of more common species present in or near the study area.

4.2 Mammals

White-tail deer, coyote, snowshoe hare and red squirrel sign was found throughout the study area. A black bear (*Ursus americanus*) was observed crossing the highway approximately 1 km from the quarry and may include the study area within its home range. A large amount of red oak mast (acorns) was observed in the southern portion of the study area. This is a highly nutritious food source that would attract a wide variety of vertebrate species ranging from small mammals such as white-footed mice (*Peromyscus leucopus*), deer mice (*Peromyscus maniculatus*), chipmunks (*Tamias striatus*), flying squirrels (*Glaucomys spp*), and red squirrels, to large mammals such as white-tail deer, moose, and black bear. Similar to black bear, moose may utilize the study area seasonally as part of their home range. AC CDC records (May 2022) show many records of moose within a 100 km radius, with the closest being 2.3 km from the center of the study area. The combination of aquatic habitats with abundant browse, and areas with high mast production, may be attractive to moose at specific times of year, and therefore, moose may use this area to meet some of their seasonal life-history needs.

High densities of small mammals may attract predators such as short-tailed weasel (*Mustela erminea*), Eastern coyote, and red fox (*Vulpes vulpes*). Both inhabit a variety of habitats such as open and regenerating forest, and wetland edges, which can be found within the study area.

Mid-sized mammals such as American marten (*Martes americana*) and fisher (*Pekania pennanti*) generally prefer mature and late seral forests with large diameter trees and abundant coarse woody material. There was little evidence of these habitat elements on the study site. Both fisher and marten are present in western Nova Scotia but have not been documented by the AC CDC within tens of kilometers of the study site (Table 1).

Provincially and federally endangered bat species have not been reported at or near the study area (Table 1); however, the presence of mature trees and snags for roosting cover, as well as open water and bog wetland types for a source of aerial insects suggests the potential presence of these species. Consequently, a targeted survey for bats may be appropriate.

Aquatic habitats that could contribute to furbearer, and herpetofauna habitat were present in the study area - a small drainage brook, a small pond, and a shrub bog (Figures 5 a, b, c; Photo waypoints 149, 152, 153). The small watercourse may serve as a travel and foraging corridor for mammals such as raccoon (*Procyon lotor*), mink (*Neovison vison*), and otter (*Lontra canadensis*).

4.3 Herpetofauna

A single bullfrog was the only amphibian detected in the small pond, and no other herptiles were found either in the pond or adjacent wetland. Bullfrogs are ambush predators that eat a wide variety of prey types including other frogs and salamanders.

No reptiles, including snakes, or turtles were observed. Snapping turtle are not likely to be present in the study area because the wetlands are not large or productive enough to support them. Wood turtle have been located several kilometers away (Table 1) but there is no suitable habitat present at the study site. Wood turtle prefer mid-sized slow to moderately flowing meandering watercourses through nutrient rich sites. The watercourses observed on the study site did not appear to meet these criteria or provide critical habitats such as nesting areas and overwintering opportunities. Eastern painted turtle do inhabit small ponds; however, the closest reported occurrences are 27 km away (AC CDC 2022), and this study area lacks an obvious ecological connection to other known populations. Similarly, there was no high probability habitat present for Blandings turtle or Eastern ribbonsnake. Both species use a variety of habitats depending on their seasonal needs but generally show an affinity for wetlands with slow moving water that are large and productive enough to sustain abundant aquatic vegetation such as lake shore coves, and fens that have pools and side channels (NSDNR 2020 a, b); therefore, it is unlikely that either species occurs at the site.

5.0 References

Nova Scotia Department of Natural Resources and Renewables. 2021. Recovery Plan for the Moose (*Alces alces americana*) in Mainland Nova Scotia. Nova Scotia Endangered Species Act Recovery Plan Series. 96pp

Nova Scotia Department of Natural Resources and Renewables. 2020 a. Recovery Plan for the Blanding's turtle (*Emydoidea blandingii*) in Nova Scotia [Final]. Nova Scotia Endangered Species Act Recovery Plan Series.

Nova Scotia Department of Natural Resources and Renewables. 2020 b. Recovery Plan for the Eastern Ribbonsnake (*Thamnophis sauritus*) in Nova Scotia [Final]. Nova Scotia Endangered Species Act Recovery Plan Series.

APPENDIX D

ATLANTIC CANADA CONSERVATION DATA CENTRE REPORT

DATA REPORT 7229: Granite Village, NS

Prepared 24 March 2022
by J. Pender, Data Manager

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- 5.1 Source Bibliography



Map 1. A 100 km buffer around the study area

1.0 PREFACE

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

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

1.1 DATA LIST

Included datasets:

<u>Filename</u>	<u>Contents</u>
GraniteVillaNS_7229ob.xls	Rare or legally-protected Flora and Fauna in your study area
GraniteVillaNS_7229ob100km.xls	A list of Rare and legally protected Flora and Fauna within 100 km of your study area
GraniteVillaNS_7229msa.xls	Managed and Biologically Significant Areas in your study area

1.2 RESTRICTIONS

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

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

1.3 ADDITIONAL INFORMATION

The accompanying Data Dictionary provides metadata for the data provided.

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

Plants, Lichens, Ranking Methods, All other Inquiries

Sean Blaney
Senior Scientist / Executive Director
(506) 364-2658
sean.blaney@accdc.ca

Animals (Fauna)

John Klymko
Zoologist
(506) 364-2660
john.klymko@accdc.ca

Data Management, GIS

James Churchill
Conservation Data Analyst / Field Biologist
(902) 679-6146
james.churchill@accdc.ca

Billing

Jean Breau
Financial Manager / Executive Assistant
(506) 364-2657
jean.breau@accdc.ca

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

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in New Brunswick, please contact Hubert Askanas, Energy and Resource Development: (506) 453-5873.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in Nova Scotia, please contact Donna Hurlburt, NS DLF: (902) 679-6886. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NS DLF Regional Biologist:

Western: Emma Vost
(902) 670-8187
Emma.Vost@novascotia.ca

Western: Sarah Spencer
(902) 541-0081
Sarah.Spencer@novascotia.ca

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(902) 893-0816
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Central: Kimberly George
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Kimberly.George@novascotia.ca

Eastern: Harrison Moore
(902) 497-4119
Harrison.Moore@novascotia.ca

Eastern: Maureen Cameron-MacMillan
(902) 295-2554
Maureen.Cameron-MacMillan@novascotia.ca

Eastern: Elizabeth Walsh
(902) 563-3370
Elizabeth.Walsh@novascotia.ca

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

2.0 RARE AND ENDANGERED SPECIES

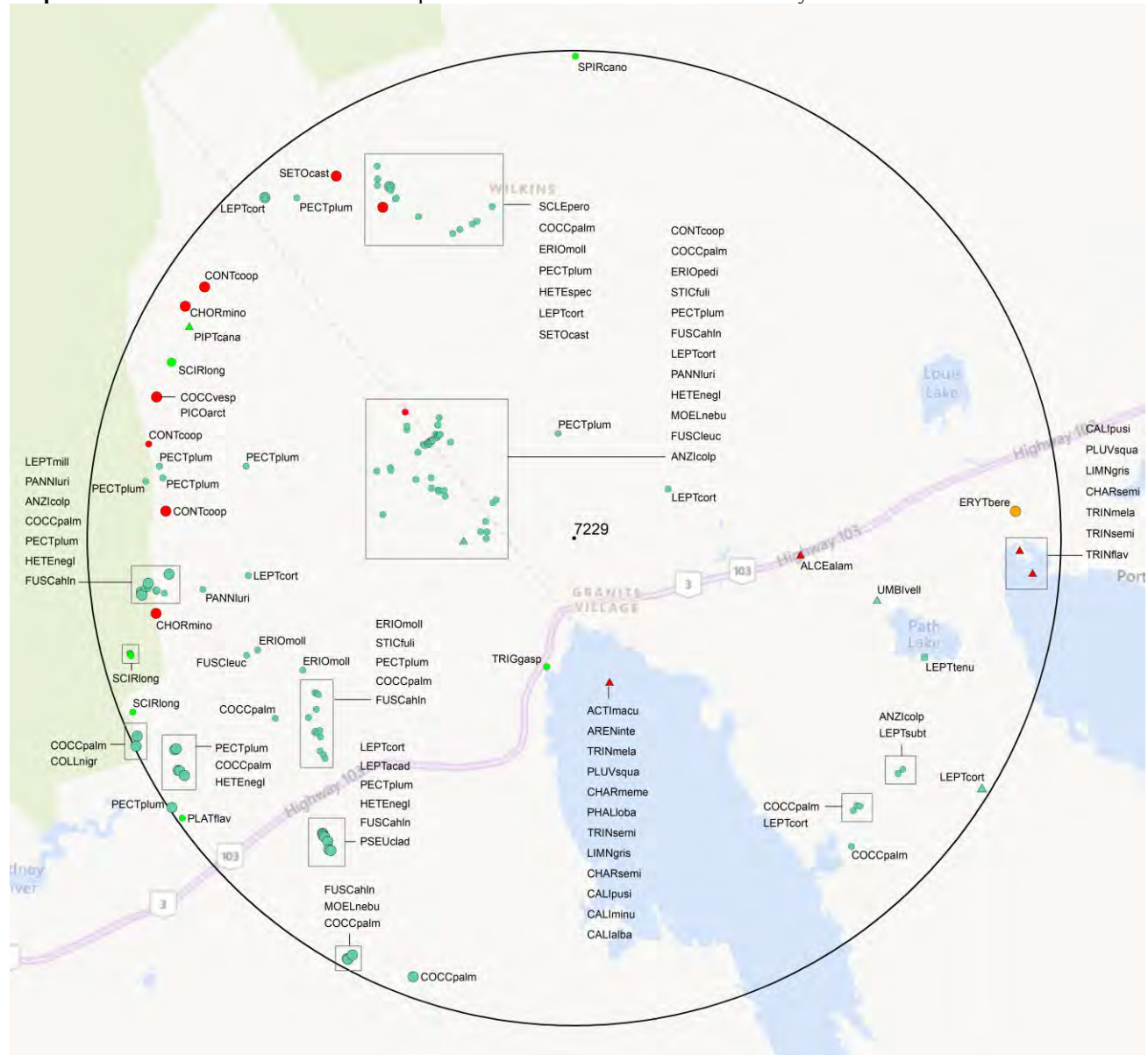
2.1 FLORA

The study area contains 10 records of 5 vascular, 137 records of 21 nonvascular flora (Map 2 and attached: *ob.xls), excluding 'location-sensitive' species.

2.2 FAUNA

The study area contains 101 records of 19 vertebrate, 1 record of 1 invertebrate fauna (Map 2 and attached data files - see 1.1 Data List), excluding 'location-sensitive' species. Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

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



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

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

3.0 SPECIAL AREAS

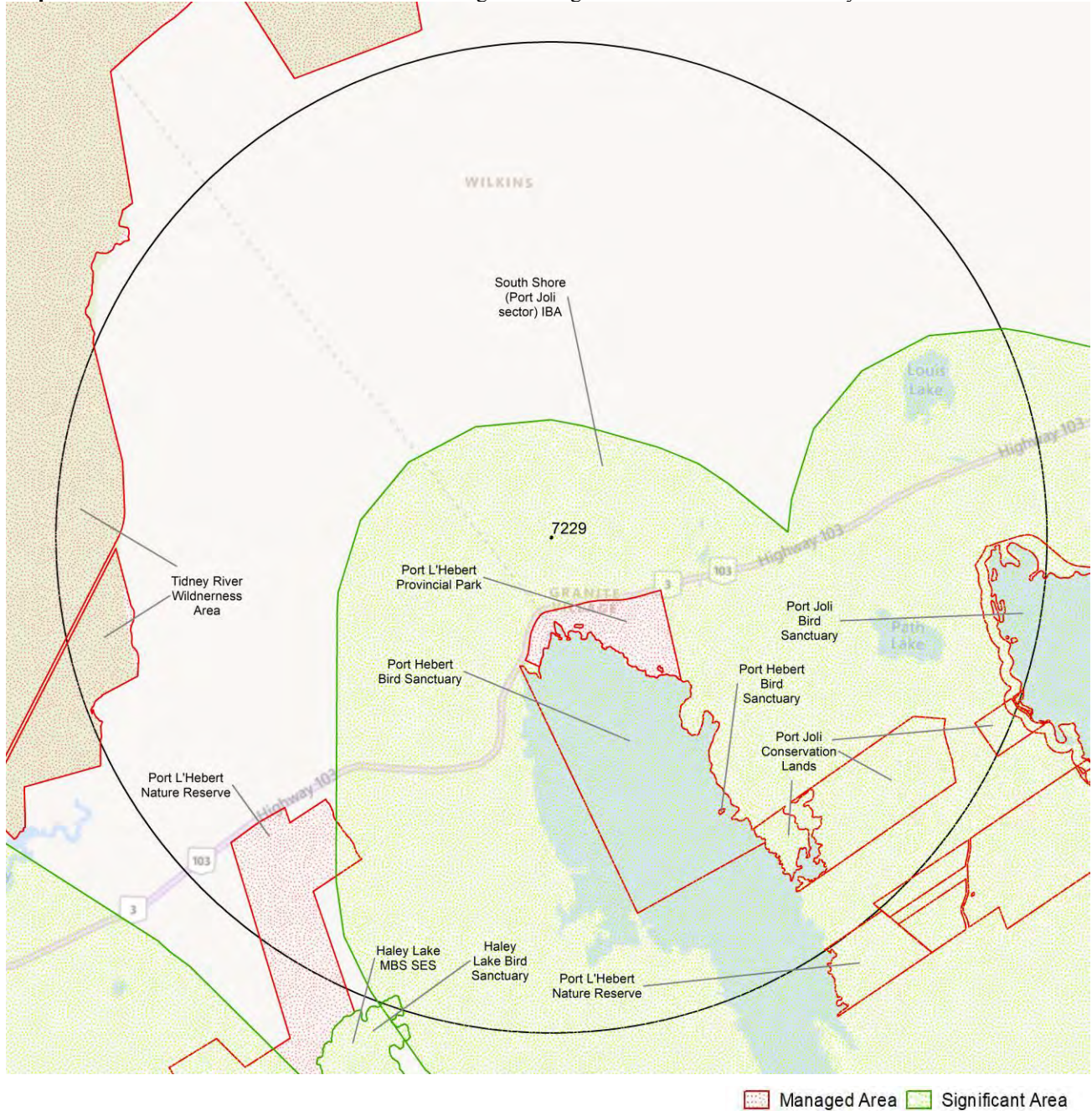
3.1 MANAGED AREAS

The GIS scan identified 9 managed areas in the vicinity of the study area (Map 3 and attached file: *msa.xls).

3.2 SIGNIFICANT AREAS

The GIS scan identified 2 biologically significant sites in the vicinity of the study area (Map 3 and attached file: *msa.xls).

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



4.0 RARE SPECIES LISTS

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

4.1 FLORA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
N	<i>Erioderma mollissimum</i>	Graceful Felt Lichen	Endangered	Endangered	Endangered	S1	4	3.1 \pm 0.0
N	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	9	1.1 \pm 0.0
N	<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened	Threatened	Threatened	S2S3	3	2.1 \pm 0.0
N	<i>Anzia colpodes</i>	Black-foam Lichen	Threatened	Threatened	Threatened	S3	4	0.9 \pm 0.0
N	<i>Fuscopannaria leucosticta</i>	White-rimmed Shingle Lichen	Threatened			S3	3	1.1 \pm 0.0
N	<i>Pectenaria plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	29	0.9 \pm 0.0
N	<i>Sclerophora peronella</i> (Atlantic pop.)	Frosted Glass-whiskers (Atlantic population)	Special Concern	Special Concern		S3S4	3	4.1 \pm 0.0
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	1	4.1 \pm 0.0
N	<i>Umbilicaria vellea</i>	Grizzled Rocktripe Lichen				S1	1	3.2 \pm 0.0
N	<i>Moelleropsis nebulosa</i>	Blue-gray Moss Shingle Lichen				S2S3	4	0.9 \pm 0.0
N	<i>Scytinium tenuissimum</i>	Birdnest Jellyskin Lichen				S2S3	1	3.8 \pm 6.0
N	<i>Collema nigrescens</i>	Blistered Tarpaper Lichen				S3	1	4.9 \pm 0.0
N	<i>Fuscopannaria ahlneri</i>	Corrugated Shingles Lichen				S3	7	1.8 \pm 0.0
N	<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen				S3	2	4.5 \pm 0.0
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3S4	5	1.6 \pm 0.0
N	<i>Leptogium acadiense</i>	Acadian Jellyskin Lichen				S3S4	1	4.0 \pm 0.0
N	<i>Scytinium subtile</i>	Appressed Jellyskin Lichen				S3S4	1	4.1 \pm 0.0
N	<i>Heterodermia speciosa</i>	Powdered Fringe Lichen				S3S4	1	3.7 \pm 0.0
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S3S4	11	1.1 \pm 0.0
N	<i>Coccocarpi palmicola</i>	Salted Shell Lichen				S3S4	39	0.9 \pm 0.0
N	<i>Heterodermia neglecta</i>	Fringe Lichen				S3S4	7	1.6 \pm 0.0
P	<i>Scirpus longii</i>	Long's Bulrush	Special Concern		Vulnerable	S3	6	4.5 \pm 0.0
P	<i>Spiranthes casei</i> var. <i>novaescotiae</i>	Case's Ladies'-Tresses				S2S3	1	4.9 \pm 0.0
P	<i>Platanthera flava</i>	Southern Rein-Orchid				S3	1	4.9 \pm 0.0
P	<i>Piptatheropsis canadensis</i>	Canada Ricegrass				S3	1	4.5 \pm 0.0
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3S4	1	1.3 \pm 0.0

4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	<i>Charadrius melodus melodus</i>	Piping Plover <i>melodus</i> subspecies	Endangered	Endangered	Endangered	S1B	3	1.5 \pm 0.0
A	<i>Tringa flavipes</i>	Lesser Yellowlegs	Threatened			S3M	1	4.7 \pm 0.0
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern	Special Concern		S2S3M	1	1.5 \pm 0.0
A	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Threatened	Threatened	S3B	2	4.4 \pm 0.0
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S3B	6	1.8 \pm 0.0
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B,S3N,S3M	1	4.5 \pm 0.0
A	<i>Alces alces americana</i>	Moose			Endangered	S1	1	2.3 \pm 0.0
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S4M	9	1.5 \pm 0.0
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S4M	9	1.5 \pm 0.0
A	<i>Calidris alba</i>	Sanderling				S2N,S3M	7	1.5 \pm 0.0
A	<i>Tringa semipalmata</i>	Willet				S3B	11	1.5 \pm 0.0
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S4M	7	1.5 \pm 0.0
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	8	1.5 \pm 0.0
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	5	1.5 \pm 0.0
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	10	1.5 \pm 0.0

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	8	1.5 ± 0.0
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	2	4.5 ± 0.0
A	<i>Setophaga castanea</i>	Bay-breasted Warbler				S3S4B,S4S5M	2	3.9 ± 0.0
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B,S5M	8	1.5 ± 0.0
I	<i>Erythrodiplax berenice</i>	Seaside Dragonlet				S3S4	1	4.5 ± 0.0

4.3 LOCATION SENSITIVE SPECIES

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

Nova Scotia

Scientific Name	Common Name	SARA	Prov Legal Prot	Known within the Study Site?
<i>Fraxinus nigra</i>	Black Ash		Threatened	No
<i>Emydoidea blandingii</i>	Blanding's Turtle - Nova Scotia pop.	Endangered	Vulnerable	No
<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	No
<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Vulnerable	No
Bat hibernaculum or bat species occurrence		[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 NS Endangered Species Act.

4.4 SOURCE BIBLIOGRAPHY

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

# recs	CITATION
87	Morrison, Guy. 2011. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Ottawa, 15939 surveys. 86171 recs.
48	Neily, T.H. & Pepper, C.; Toms, B. 2013. Nova Scotia lichen location database. Mersey Tobeatic Research Institute, 1301 records.
30	Cameron, R.P. 2009. Cyanolichen database. Nova Scotia Environment & Labour, 1724 recs.
22	Neily, T.H. 2017. Nova Scotia lichen records. Mersey Tobeatic Research Institute.
10	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
8	Canadian Wildlife Service. 2019. Canadian Protected and Conserved Areas Database (CPCAD). December 2019. ECCC. https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/protected-conserved-areas-database.html .
7	Belliveau, A.G. 2018. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2018. E.C. Smith Herbarium, 6226 recs.
5	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2015. Atlantic Canada Conservation Data Centre Fieldwork 2015. Atlantic Canada Conservation Data Centre, # recs.
5	Cameron, R.P. 2011. Lichen observations, 2011. Nova Scotia Environment & Labour, 731 recs.
5	Mazerolle, D.M. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 13515 recs.
5	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-03-18]. Mersey Tobeatic Research Institute.
3	iNaturalist. 2020. iNaturalist Data Export 2020. iNaturalist.org and iNaturalist.ca, Web site: 128728 recs.
2	Benjamin, L.K. 2012. NSDNR fieldwork & consultant reports 2008-2012. Nova Scotia Dept Natural Resources, 196 recs.
2	Misc. rare species records gathered by NSDNR staff or communicated to NSDNR and forwarded to ACCDC
2	Munro, Marian K. Tracked lichen specimens, Nova Scotia Provincial Museum of Natural History Herbarium. Atlantic Canada Conservation Data Centre. 2019.
2	Neily, T.H. & Pepper, C.; Toms, B. 2015. Nova Scotia lichen location database [as of 2015-02-15]. Mersey Tobeatic Research Institute, 1691 records.
2	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: http://luxor.acadiau.ca/library/Herbarium/project/ . 582 recs.
1	Belliveau, A.G. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
1	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
1	Benjamin, L.K. (compiler). 2012. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 4965 recs.
1	Bird Studies Canada. 2020. Important Bird and Biodiversity Areas in Canada database (Retrieved: 28 July, 2020 from https://www.ibacanada.com/explore.jsp?lang=EN). IBA Program.
1	Blaney, C.S.; Spicer, C.D. 2001. Fieldwork 2001. Atlantic Canada Conservation Data Centre. Sackville NB, 981 recs.
1	Brunelle, P.-M. (compiler). 2009. ADIP/MDDS Odonata Database: data to 2006 inclusive. Atlantic Dragonfly Inventory Program (ADIP), 24200 recs.
1	Cameron, R.P. 2017. 2017 rare species field data. Nova Scotia Environment, 64 recs.
1	Chapman, C.J. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 11171 recs.
1	Clayden, S. Digitization of Wolfgang Maass Nova Scotia forest lichen collections, 1964-2004. New Brunswick Museum. 2018.
1	Haughian, S.R. 2018. Description of Fuscopannaria leucosticta field work in 2017. New Brunswick Museum, 314 recs.
1	Neily, T.H. & Pepper, C.; Toms, B. 2018. Nova Scotia lichen database [as of 2018-03]. Mersey Tobeatic Research Institute.
1	Nova Scotia Department of Lands and Forestry. 2020. NS Lands Proposed or Pending Protection. NSDLF, 231 features. Received via email.
1	Richardson, D., Anderson, F., Cameron, R, McMullin, T., Clayden, S. 2014. Field Work Report on Black Foam Lichen (<i>Anzia colpodes</i>). COSEWIC.
1	Richardson, D., Anderson, F., Cameron, R, Pepper, C., Clayden, S. 2015. Field Work Report on the Wrinkled Shingle lichen (<i>Pannaria lurida</i>). COSEWIC.
1	Westwood, A., Staicer, C. 2016. Nova Scotia landbird Species at Risk observations. Dalhousie University.

5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 48644 records of 139 vertebrate and 578 records of 43 invertebrate fauna; 18736 records of 199 vascular, 4793 records of 143 nonvascular flora (attached: *ob100km.xls).

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

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	<i>Coregonus huntsmani</i>	Atlantic Whitefish	Endangered	Endangered	Endangered	S1	132	53.7 \pm 1.0	NS
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	556	8.5 \pm 0.0	NS
A	<i>Myotis septentrionalis</i>	Northern Myotis	Endangered	Endangered	Endangered	S1	81	28.9 \pm 0.0	NS
A	<i>Perimyotis subflavus</i>	Tricolored Bat	Endangered	Endangered	Endangered	S1	182	27.5 \pm 0.0	NS
A	<i>Emydoidea blandingii</i>	Blanding's Turtle	Endangered	Endangered	Endangered	S1	10049	26.4 \pm 0.0	NS
A	<i>Salmo salar pop. 1</i>	Atlantic Salmon - Inner Bay of Fundy population	Endangered	Endangered		S1	4	90.5 \pm 1.0	NS
A	<i>Salmo salar pop. 6</i>	Atlantic Salmon - Nova Scotia Southern Upland population	Endangered			S1	21	26.7 \pm 1.0	NS
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus subspecies	Endangered	Endangered	Endangered	S1B	2541	1.5 \pm 0.0	NS
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	136	11.3 \pm 0.0	NS
A	<i>Dermodochelys coriacea pop. 2</i>	Leatherback Sea Turtle - Atlantic population	Endangered	Endangered		S1S2N	1	79.0 \pm 1.0	NS
A	<i>Morone saxatilis pop. 2</i>	Striped Bass - Bay of Fundy population	Endangered			S2S3B,S2S3N	2	96.5 \pm 1.0	NS
A	<i>Prothonotaria citrea</i>	Prothonotary Warbler	Endangered	Endangered		SNA	4	72.3 \pm 0.0	NS
A	<i>Icteria virens</i>	Yellow-Breasted Chat	Endangered	Endangered		SNA	2	67.9 \pm 0.0	NS
A	<i>Colinus virginianus</i>	Northern Bobwhite	Endangered	Endangered			9	62.3 \pm 7.0	NS
A	<i>Antrostomus vociferus</i>	Eastern Whip-Poor-Will	Threatened	Threatened	Threatened	S1?B	7	49.0 \pm 7.0	NS
A	<i>Asio flammeus</i>	Short-eared Owl	Threatened	Special Concern		S1B	11	67.9 \pm 0.0	NS
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2	10	27.4 \pm 5.0	NS
A	<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Endangered	S2B	491	5.8 \pm 7.0	NS
A	<i>Thamnophis saurita</i>	Eastern Ribbonsnake	Threatened	Threatened	Threatened	S2S3	2133	7.5 \pm 0.0	NS
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2S3B,S1M	286	5.6 \pm 0.0	NS
A	<i>Limosa haemastica</i>	Hudsonian Godwit	Threatened			S2S3M	248	12.8 \pm 0.0	NS
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	Threatened	Vulnerable	S3B	190	6.5 \pm 7.0	NS
A	<i>Hydrobates leucorhous</i>	Leach's Storm-Petrel	Threatened			S3B	76	14.7 \pm 0.0	NS
A	<i>Tringa flavipes</i>	Lesser Yellowlegs	Threatened			S3M	876	4.7 \pm 0.0	NS
A	<i>Anguilla rostrata</i>	American Eel	Threatened			S3N	257	12.6 \pm 0.0	NS
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened	Threatened		SHB	2	96.5 \pm 7.0	NS
A	<i>Ixobrychus exilis</i>	Least Bittern	Threatened	Threatened		SUB	1	67.9 \pm 0.0	NS
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened	Threatened		SUB	22	27.7 \pm 7.0	NS
A	<i>Passerculus sandwichensis princeps</i>	Ipswich Sparrow	Special Concern	Special Concern		S1B	5	67.9 \pm 0.0	NS
A	<i>Bucephala islandica</i>	Barrow's Goldeneye	Special Concern	Special Concern		S1N,SUM	1	92.8 \pm 0.0	NS
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	168	7.9 \pm 7.0	NS
A	<i>Balaenoptera physalus</i>	Fin Whale	Special Concern	Special Concern		S2S3	1	76.4 \pm 0.0	NS
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern	Special Concern		S2S3M	8	1.5 \pm 0.0	NS
A	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern population	Special Concern	Special Concern	Endangered	S2S3N,SUM	34	5.9 \pm 6.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	358	8.4 ± 0.0	NS
A	<i>Hirundo rustica</i>	Barn Swallow	Special Concern	Threatened	Endangered	S3B	726	5.8 ± 7.0	NS
A	<i>Cardellina canadensis</i>	Canada Warbler	Special Concern	Threatened	Endangered	S3B	387	5.1 ± 0.0	NS
A	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Threatened	Threatened	S3B	394	4.4 ± 0.0	NS
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S3B	693	1.8 ± 0.0	NS
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B,S3N,S3M	536	4.5 ± 0.0	NS
A	<i>Podiceps auritus</i>	Horned Grebe	Special Concern	Special Concern		S3N,SUM	8	5.8 ± 1.0	NS
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	786	6.5 ± 7.0	NS
A	<i>Phocoena phocoena</i>	Harbour Porpoise	Special Concern			S4	6	67.3 ± 1.0	NS
A	<i>Chrysemys picta picta</i>	Eastern Painted Turtle	Special Concern	Special Concern		S4	556	27.0 ± 10.0	NS
A	<i>Calidris subruficollis</i>	Buff-breasted Sandpiper	Special Concern	Special Concern		SNA	92	20.2 ± 0.0	NS
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1?B,SUN,SUM	3	64.8 ± 0.0	NS
A	<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius	Not At Risk	Special Concern	Vulnerable	S1B,SUM	8	54.4 ± 0.0	NS
A	<i>Lynx canadensis</i>	Canada Lynx	Not At Risk		Endangered	S2S3	3	64.8 ± 1.0	NS
A	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk			S3	15	9.0 ± 0.0	NS
A	<i>Megaptera novaeangliae</i>	Humpback Whale	Not At Risk			S3	1	95.6 ± 0.0	NS
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	360	6.5 ± 7.0	NS
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	20	6.5 ± 7.0	NS
A	<i>Buteo lagopus</i>	Rough-legged Hawk	Not At Risk			S3N	2	67.9 ± 1.0	NS
A	<i>Accipiter gentilis</i>	Northern Goshawk	Not At Risk			S3S4	40	41.6 ± 7.0	NS
A	<i>Glaucomys volans</i>	Southern Flying Squirrel	Not At Risk			S3S4	9	55.7 ± 0.0	NS
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4	1	7.8 ± 2.0	NS
A	<i>Ammospiza nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	98	12.5 ± 0.0	NS
A	<i>Calidris canutus rufa</i>	Tierra del Fuego / Patagonia wintering population	E,SC	Endangered	Endangered	S2M	819	12.3 ± 0.0	NS
A	<i>Morone saxatilis</i>	Striped Bass	E,SC			S2S3B,S2S3N	8	25.7 ± 1.0	NS
A	<i>Alces alces americana</i>	Moose			Endangered	S1	118	2.3 ± 0.0	NS
A	<i>Uria aalge</i>	Common Murre				S1?B	2	67.9 ± 0.0	NS
A	<i>Passerina cyanea</i>	Indigo Bunting				S1?B,SUM	24	22.6 ± 7.0	NS
A	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1B	22	65.0 ± 7.0	NS
A	<i>Gallinula galeata</i>	Common Gallinule				S1B	1	67.9 ± 0.0	NS
A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S1B	30	27.7 ± 7.0	NS
A	<i>Cistothorus palustris</i>	Marsh Wren				S1B	4	69.6 ± 7.0	NS
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S1B	14	6.5 ± 7.0	NS
A	<i>Toxostoma rufum</i>	Brown Thrasher				S1B	5	14.3 ± 7.0	NS
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S4M	2266	1.5 ± 0.0	NS
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S4M	1583	1.5 ± 0.0	NS
A	<i>Anas acuta</i>	Northern Pintail				S1B,SUM	7	10.2 ± 8.0	NS
A	<i>Vireo gilvus</i>	Warbling Vireo				S1B,SUM	11	5.1 ± 0.0	NS
A	<i>Vespertilionidae sp.</i>	bat species				S1S2	241	4.6 ± 0.0	NS
A	<i>Pooecetes gramineus</i>	Vesper Sparrow				S1S2B,SUM	2	50.4 ± 7.0	NS
A	<i>Vireo philadelphicus</i>	Philadelphia Vireo				S2?B,SUM	7	33.1 ± 0.0	NS
A	<i>Alca torda</i>	Razorbill				S2B	28	22.1 ± 0.0	NS
A	<i>Fratercula arctica</i>	Atlantic Puffin				S2B	58	22.1 ± 0.0	NS
A	<i>Empidonax traillii</i>	Willow Flycatcher				S2B	17	16.7 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	103	6.5 ± 7.0	NS
A	<i>Spatula clypeata</i>	Northern Shoveler				S2B,SUM	2	67.9 ± 0.0	NS
A	<i>Mareca strepera</i>	Gadwall				S2B,SUM	4	67.9 ± 0.0	NS
A	<i>Piranga olivacea</i>	Scarlet Tanager				S2B,SUM	37	27.8 ± 0.0	NS
A	<i>Calidris alba</i>	Sanderling				S2N,S3M	1775	1.5 ± 0.0	NS
A	<i>Martes americana</i>	American Marten			Endangered	S2S3	24	24.2 ± 0.0	NS
A	<i>Asio otus</i>	Long-eared Owl				S2S3	11	36.9 ± 7.0	NS
A	<i>Rallus limicola</i>	Virginia Rail				S2S3B	2	71.7 ± 0.0	NS
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S2S3B	8	71.9 ± 0.0	NS
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	129	14.3 ± 7.0	NS
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2S3B,S2S3N	30	12.6 ± 0.0	NS
A	<i>Cathartes aura</i>	Turkey Vulture				S2S3B,S4S5M	15	11.7 ± 1.0	NS
A	<i>Setophaga pinus</i>	Pine Warbler				S2S3B,S4S5M	10	46.5 ± 0.0	NS
A	<i>Bucephala clangula</i>	Common Goldeneye				S2S3B,S5N,S5M	92	7.5 ± 1.0	NS
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B,SUM	47	6.5 ± 7.0	NS
A	<i>Pluvialis dominica</i>	American Golden-Plover				S2S3M	315	12.3 ± 0.0	NS
A	<i>Numerius phaeopus hudsonicus</i>	Whimbrel				S2S3M	567	9.3 ± 0.0	NS
A	<i>Phalaropus fulicarius</i>	Red Phalarope				S2S3M	4	20.2 ± 0.0	NS
A	<i>Perisoreus canadensis</i>	Canada Jay				S3	267	6.5 ± 7.0	NS
A	<i>Poecile hudsonicus</i>	Boreal Chickadee				S3	239	6.5 ± 7.0	NS
A	<i>Spinus pinus</i>	Pine Siskin				S3	183	8.5 ± 7.0	NS
A	<i>Salvelinus fontinalis</i>	Brook Trout				S3	12	50.6 ± 1.0	NS
A	<i>Pekania pennanti</i>	Fisher				S3	8	31.7 ± 5.0	NS
A	<i>Calcarius lapponicus</i>	Lapland Longspur				S3?N,SUM	2	62.4 ± 0.0	NS
A	<i>Spatula discors</i>	Blue-winged Teal				S3B	25	6.5 ± 7.0	NS
A	<i>Charadrius vociferus</i>	Killdeer				S3B	478	6.5 ± 7.0	NS
A	<i>Tringa semipalmata</i>	Willet				S3B	2490	1.5 ± 0.0	NS
A	<i>Sterna paradisaea</i>	Arctic Tern				S3B	138	7.9 ± 0.0	NS
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B	34	6.5 ± 7.0	NS
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	104	6.5 ± 7.0	NS
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S3B	131	22.6 ± 7.0	NS
A	<i>Alosa pseudoharengus</i>	Alewife				S3B	19	7.4 ± 1.0	NS
A	<i>Somateria mollissima</i>	Common Eider				S3B,S3M,S3N	564	6.5 ± 7.0	NS
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S4M	2138	1.5 ± 0.0	NS
A	<i>Falco sparverius</i>	American Kestrel				S3B,S4S5M	73	7.9 ± 7.0	NS
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B,S5M	283	6.5 ± 7.0	NS
A	<i>Setophaga striata</i>	Blackpoll Warbler				S3B,S5M	42	11.3 ± 0.0	NS
A	<i>Cardellina pusilla</i>	Wilson's Warbler				S3B,S5M	35	15.8 ± 7.0	NS
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S3B,S5N,S5M	68	7.9 ± 7.0	NS
A	<i>Setophaga tigrina</i>	Cape May Warbler				S3B,SUM	40	5.3 ± 0.0	NS
A	<i>Branta bernicla</i>	Brant				S3M	11	50.1 ± 12.0	NS
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	2394	1.5 ± 0.0	NS
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	1065	1.5 ± 0.0	NS
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	2162	1.5 ± 0.0	NS
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S3M	410	11.5 ± 0.0	NS
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	1460	1.5 ± 0.0	NS
A	<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S3N	3	67.9 ± 1.0	NS
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	37	4.5 ± 0.0	NS
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	181	6.5 ± 7.0	NS
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B,S4S5M	114	41.3 ± 0.0	NS
A	<i>Setophaga castanea</i>	Bay-breasted Warbler				S3S4B,S4S5M	179	3.9 ± 0.0	NS
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B,S5M	769	1.5 ± 0.0	NS
A	<i>Leiothlypis peregrina</i>	Tennessee Warbler				S3S4B,S5M	80	6.5 ± 7.0	NS
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B,S5M	45	6.5 ± 7.0	NS
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3S4B,S5M,S5N	54	10.2 ± 8.0	NS
A	<i>Calidris maritima</i>	Purple Sandpiper				S3S4N	192	8.8 ± 8.0	NS
A	<i>Lanius borealis</i>	Northern Shrike				S3S4N	2	60.7 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	<i>Morus bassanus</i>	Northern Gannet				SHB	10	27.8 ± 0.0	NS
A	<i>Leucophaeus atricilla</i>	Laughing Gull				SHB	6	46.5 ± 0.0	NS
A	<i>Progne subis</i>	Purple Martin				SHB	3	67.9 ± 0.0	NS
A	<i>Eremophila alpestris</i>	Horned Lark				SHB,S4S5N,S5M	3	67.9 ± 0.0	NS
I	<i>Bombus bohemicus</i>	Ashton Cuckoo Bumble Bee	Endangered	Endangered	Endangered	S1	5	44.6 ± 5.0	NS
I	<i>Danaus plexippus</i>	Monarch	Endangered	Special Concern	Endangered	S2?B,S3M	250	6.3 ± 0.0	NS
I	<i>Danaus plexippus plexippus</i>	Monarch	Endangered	Special Concern		S2?B,S3M	1	77.9 ± 0.0	NS
I	<i>Bombus suckleyi</i>	Suckley's Cuckoo Bumble Bee	Threatened			SH	2	64.5 ± 0.0	NS
I	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern	Special Concern	Threatened	S3	2	67.8 ± 0.0	NS
I	<i>Bombus terricola</i>	Yellow-banded Bumble Bee	Special Concern	Special Concern	Vulnerable	S3	32	14.7 ± 0.0	NS
I	<i>Ophiogomphus anomalus</i>	Extra-Striped Snaketail				S1	8	40.5 ± 0.0	NS
I	<i>Pachydiplax longipennis</i>	Blue Dasher				S1	1	67.9 ± 0.0	NS
I	<i>Atlanticoncha ochracea</i>	Tidewater Mucket				S1	1	90.3 ± 0.0	NS
I	<i>Margaritifera margaritifera</i>	Eastern Pearlshell				S2	4	59.6 ± 0.0	NS
I	<i>Pantala hymenaea</i>	Spot-Winged Glider				S2?B	2	33.8 ± 0.0	NS
I	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S2S3	5	57.8 ± 0.0	NS
I	<i>Somatochlora kennedyi</i>	Kennedy's Emerald				S2S3	4	26.8 ± 0.0	NS
I	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S2S3	3	26.8 ± 0.0	NS
I	<i>Enallagma geminatum</i>	Skimming Bluet				S2S3	4	62.0 ± 0.0	NS
I	<i>Hippodamia parenthesis</i>	Parenthesis Lady Beetle				S3	2	68.1 ± 0.0	NS
I	<i>Naemia seriata</i>	Seaside Lady Beetle				S3	3	68.0 ± 1.0	NS
I	<i>Chilocorus stigma</i>	Twice-stabbed Lady Beetle				S3	4	50.0 ± 0.0	NS
I	<i>Myzia pullata</i>	Streaked Lady Beetle				S3	1	83.6 ± 0.0	NS
I	<i>Astylopsis sexguttata</i>	Six-speckled Long-horned Beetle				S3	1	13.5 ± 0.0	NS
I	<i>Satyrium calanus</i>	Banded Hairstreak				S3	2	36.1 ± 2.0	NS
I	<i>Callophrys lanoraieensis</i>	Bog Elfin				S3	9	66.8 ± 2.0	NS
I	<i>Strymon melinus</i>	Gray Hairstreak				S3	10	40.1 ± 0.0	NS
I	<i>Ophiogomphus aspersus</i>	Brook Snaketail				S3	2	38.2 ± 1.0	NS
I	<i>Ophiogomphus mainensis</i>	Maine Snaketail				S3	9	42.1 ± 0.0	NS
I	<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail				S3	12	39.8 ± 0.0	NS
I	<i>Epitheca princeps</i>	Prince Baskettail				S3	10	25.7 ± 1.0	NS
I	<i>Somatochlora forcipata</i>	Forcipate Emerald				S3	3	26.8 ± 0.0	NS
I	<i>Polygonia interrogationis</i>	Question Mark				S3B	21	27.3 ± 0.0	NS
I	<i>Amblyscirtes hegon</i>	Pepper and Salt Skipper				S3S4	1	71.5 ± 2.0	NS
I	<i>Cupido comyntas</i>	Eastern Tailed Blue				S3S4	2	27.8 ± 1.0	NS
I	<i>Argynnis aphrodite</i>	Aphrodite Fritillary				S3S4	10	46.9 ± 0.0	NS
I	<i>Polygonia faunus</i>	Green Comma				S3S4	1	89.1 ± 20.0	NS
I	<i>Aeshna clepsydra</i>	Mottled Darner				S3S4	28	8.5 ± 0.0	NS
I	<i>Boyeria grafiana</i>	Ocellated Darner				S3S4	14	32.1 ± 0.0	NS
I	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3S4	29	25.3 ± 1.0	NS
I	<i>Somatochlora franklini</i>	Delicate Emerald				S3S4	1	84.9 ± 1.0	NS
I	<i>Erythrodiplax berenice</i>	Seaside Dragonlet				S3S4	33	4.5 ± 0.0	NS
I	<i>Nannothemis bella</i>	Elfin Skimmer				S3S4	19	25.0 ± 0.0	NS
I	<i>Sympetrum danae</i>	Black Meadowhawk				S3S4	1	73.3 ± 0.0	NS
I	<i>Enallagma vesperum</i>	Vesper Bluet				S3S4	19	33.5 ± 0.0	NS
I	<i>Amphiagrion saucium</i>	Eastern Red Damsel				S3S4	3	59.8 ± 1.0	NS
I	<i>Chlosyne nycteis</i>	Silvery Checkerspot				SH	4	83.6 ± 2.0	NS
N	<i>Erioderma mollissimum</i>	Graceful Felt Lichen	Endangered	Endangered	Endangered	S1	304	3.1 ± 0.0	NS
N	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	58	1.1 ± 0.0	NS
N	<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened	Threatened	Threatened	S2S3	87	2.1 ± 0.0	NS
N	<i>Pannaria lurida ssp. russellii</i>	Wrinkled Shingle Lichen	Threatened	Threatened		S2S3	1	57.2 ± 0.0	NS
N	<i>Anzia colpodes</i>	Black-foam Lichen	Threatened	Threatened	Threatened	S3	229	0.9 ± 0.0	NS
N	<i>Fuscopannaria leucosticta</i>	White-rimmed Shingle	Threatened			S3	419	1.1 ± 0.0	NS

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		Lichen							
N	<i>Pectenیا plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	613	0.9 ± 0.0	NS
N	<i>Sclerophora peronella</i> (Atlantic pop.)	Frosted Glass-whiskers (Atlantic population)	Special Concern	Special Concern		S3S4	99	4.1 ± 0.0	NS
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	15	4.1 ± 0.0	NS
N	<i>Frullania selwyniana</i>	Selwyn's Scalewort				S1	8	89.5 ± 0.0	NS
N	<i>Harpalejeunea molleri</i> ssp. <i>integra</i>	a liverwort				S1	3	89.5 ± 0.0	NS
N	<i>Homalotheciella subcapitata</i>	Few-haired Moss				S1	1	85.4 ± 0.0	NS
N	<i>Orthotrichum pallens</i>	Pale Bristle Moss				S1	1	58.8 ± 0.0	NS
N	<i>Sematophyllum demissum</i>	a Moss				S1	1	77.7 ± 1.0	NS
N	<i>Cyrto-hyphnum minutulum</i>	Tiny Cedar Moss				S1	1	60.2 ± 0.0	NS
N	<i>Umbilicaria vellea</i>	Grizzled Rocktripe Lichen				S1	3	3.2 ± 0.0	NS
N	<i>Heterodermia leucomela</i>	Elegant Fringe Lichen				S1	3	22.5 ± 0.0	NS
N	<i>Flavoparmelia baltimorensis</i>	Rock Greenshield Lichen				S1	1	13.2 ± 1.0	NS
N	<i>Ephebe hispidula</i>	Dryside Rockshag Lichen				S1	1	14.2 ± 1.0	NS
N	<i>Parmotrema perforatum</i>	Perforated Ruffle Lichen				S1	4	58.0 ± 0.0	NS
N	<i>Pseudevernia consocians</i>	Common Antler Lichen				S1	1	67.2 ± 0.0	NS
N	<i>Sticta limbata</i>	Powdered Moon Lichen				S1	5	17.4 ± 0.0	NS
N	<i>Leptogium hibernicum</i>	Hibernia Jellyskin Lichen				S1	62	26.4 ± 0.0	NS
N	<i>Hypotrachyna horrescens</i>	Hairy-spined Shield Lichen				S1	3	48.0 ± 0.0	NS
N	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen				S1	1	96.7 ± 0.0	NS
N	<i>Hypogymnia hultenii</i>	Powdered Honeycomb Lichen				S1	3	96.9 ± 0.0	NS
N	<i>Campylostelium saxicola</i>	a Moss				S1?	1	13.0 ± 1.0	NS
N	<i>Grimmia anodon</i>	Toothless Grimmi Moss				S1?	2	62.1 ± 3.0	NS
N	<i>Homomallium adnatum</i>	Adnate Hairy-gray Moss				S1?	2	59.6 ± 5.0	NS
N	<i>Sphagnum cyclophyllum</i>	a Moss				S1?	11	45.2 ± 1.0	NS
N	<i>Sphagnum molle</i>	Blushing Peat Moss				S1?	2	69.2 ± 0.0	NS
N	<i>Syntrichia ruralis</i>	a Moss				S1?	1	23.6 ± 0.0	NS
N	<i>Enchylium limosum</i>	Lime-loving Tarpaper Lichen				S1?	1	99.4 ± 0.0	NS
N	<i>Scytinium intermedium</i>	Forty-five Jellyskin Lichen				S1?	1	68.0 ± 1.0	NS
N	<i>Metzgeria crassipilis</i>	Hairy Veilwort				S1S2	3	11.2 ± 0.0	NS
N	<i>Porella pinnata</i>	Pinnate Scalewort				S1S2	1	48.6 ± 0.0	NS
N	<i>Arrhenopterum heterostichum</i>	One-sided Groove Moss				S1S2	1	72.7 ± 5.0	NS
N	<i>Didymodon rigidulus</i>	Rigid Screw Moss				S1S2	2	65.0 ± 0.0	NS
N	<i>Plagiothecium latebricola</i>	Alder Silk Moss				S1S2	1	96.9 ± 5.0	NS
N	<i>Sematophyllum marylandicum</i>	a Moss				S1S2	1	64.8 ± 0.0	NS
N	<i>Sphagnum trinitense</i>	a peatmoss				S1S2	6	57.4 ± 0.0	NS
N	<i>Tortula mucronifolia</i>	Mucronate Screw Moss				S1S2	1	62.1 ± 3.0	NS
N	<i>Pseudotaxiphyllum distichaceum</i>	a Moss				S1S2	5	68.9 ± 0.0	NS
N	<i>Pilophorus cereolus</i>	Powdered Matchstick Lichen				S1S2	1	98.4 ± 3.0	NS
N	<i>Parmotrema reticulatum</i>	Netted Ruffle Lichen				S1S2	6	69.6 ± 0.0	NS
N	<i>Cladonia subtenuis</i>	Dixie Reindeer Lichen				S1S2	1	46.9 ± 0.0	NS
N	<i>Parmeliella parvula</i>	Poor-man's Shingles Lichen				S1S2	40	5.2 ± 0.0	NS
N	<i>Umbilicaria polyrhiza</i>	Ballpoint Rocktripe Lichen				S1S3	2	13.1 ± 1.0	NS
N	<i>Peltigera neckeri</i>	Black-saddle Pelt Lichen				S1S3	1	33.4 ± 0.0	NS
N	<i>Usnea fragilecens</i>	Inflationary Beard Lichen				S1S3	2	13.4 ± 2.0	NS
N	<i>Stereocaulon grande</i>	Grand Foam Lichen				S1S3	1	45.5 ± 0.0	NS
N	<i>Stereocaulon intermedium</i>	Pacific Brain Foam Lichen				S1S3	2	58.8 ± 0.0	NS
N	<i>Anacamptodon splachnoides</i>	a Moss				S2	1	59.8 ± 0.0	NS
N	<i>Sphagnum platyphyllum</i>	Flat-leaved Peat Moss				S2	1	69.1 ± 0.0	NS
N	<i>Sphagnum subnitens</i>	Lustrous Peat Moss				S2	4	54.2 ± 0.0	NS
N	<i>Usnea flavocardia</i>	Blood-splattered Beard				S2	1	7.5 ± 1.0	NS

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N	<i>Cystocoleus ebeneus</i>	Lichen				S2	3	10.8 ± 0.0	NS
N	<i>Hypotrachyna catawbiensis</i>	Rockgossamer Lichen				S2	2	47.2 ± 0.0	NS
N	<i>Scytinium imbricatum</i>	Powder-tipped Antler Lichen				S2	1	68.3 ± 0.0	NS
N	<i>Nephroma resupinatum</i>	Scaly Jellyskin Lichen				S2	3	11.5 ± 0.0	NS
N	<i>Atrichum angustatum</i>	a lichen				S2?	7	57.7 ± 0.0	NS
N	<i>Ptychostomum pendulum</i>	Lesser Smoothcap Moss				S2?	1	37.1 ± 1.0	NS
N	<i>Drepanocladus polygamus</i>	Drooping Bryum				S2?	1	60.6 ± 0.0	NS
N	<i>Pseudocampyllum radicale</i>	Polygamous Hook Moss				S2?	2	58.7 ± 0.0	NS
N	<i>Climacium americanum</i>	Long-stalked Fine Wet Moss				S2?	9	58.2 ± 0.0	NS
N	<i>Dicranum condensatum</i>	American Tree Moss				S2?	4	40.8 ± 0.0	NS
N	<i>Ditrichum rhynchostegium</i>	Condensed Broom Moss				S2?	5	59.6 ± 5.0	NS
N	<i>Fissidens bushii</i>	a Moss				S2?	2	60.2 ± 0.0	NS
N	<i>Fontinalis hypnoides</i>	Bush's Pocket Moss				S2?	1	60.3 ± 0.0	NS
N	<i>Fontinalis sullivantii</i>	a moss				S2?	4	41.3 ± 4.0	NS
N	<i>Grimmia olneyi</i>	Sullivant's Water Moss				S2?	10	58.0 ± 0.0	NS
N	<i>Grimmia anomala</i>	a Moss				S2?	1	90.9 ± 1.0	NS
N	<i>Orthotrichum anomalum</i>	Mountain Forest Grimmia				S2?	1	58.8 ± 0.0	NS
N	<i>Philonotis marchica</i>	Anomalous Bristle Moss				S2?	1	65.0 ± 0.0	NS
N	<i>Rauvella scita</i>	a Moss				S2?	16	56.0 ± 0.0	NS
N	<i>Platylorella lescurii</i>	Smaller Fern Moss				S2?	5	58.7 ± 0.0	NS
N	<i>Phyllicium demangeonii</i>	a Moss				S2?	3	63.9 ± 2.0	NS
N	<i>Oxyrrhynchium hians</i>	Black Rock-wafer Lichen				S2S3	1	59.6 ± 5.0	NS
N	<i>Platydictya subtilis</i>	Light Beaked Moss				S2S3	1	65.2 ± 0.0	NS
N	<i>Plagiomnium rostratum</i>	Bark Willow Moss				S2S3	3	58.2 ± 0.0	NS
N	<i>Moelleropsis nebulosa</i>	Long-beaked Leafy Moss				S2S3	153	0.9 ± 0.0	NS
N	<i>Moelleropsis nebulosa ssp. frullaniae</i>	Blue-gray Moss Shingle				S2S3	9	7.9 ± 0.0	NS
N	<i>Ramalina thrausta</i>	Lichen				S2S3	1	69.3 ± 2.0	NS
N	<i>Collema leptaleum</i>	Angelhair Ramalina Lichen				S2S3	18	9.5 ± 4.0	NS
N	<i>Usnea ceratina</i>	Crumpled Bat's Wing Lichen				S2S3	3	44.8 ± 0.0	NS
N	<i>Usnea rubicunda</i>	Warty Beard Lichen				S2S3	8	12.6 ± 0.0	NS
N	<i>Ahtiana aurescens</i>	Red Beard Lichen				S2S3	16	27.7 ± 0.0	NS
N	<i>Usnocetraria oakesiana</i>	Eastern Candlewax Lichen				S2S3	4	48.6 ± 0.0	NS
N	<i>Cladonia incrasata</i>	Yellow Band Lichen				S2S3	3	41.6 ± 3.0	NS
N	<i>Cladonia mateocyatha</i>	Powder-foot British Soldiers				S2S3	2	50.5 ± 0.0	NS
N	<i>Cladonia parasitica</i>	Lichen				S2S3	1	5.6 ± 1.0	NS
N	<i>Scytinium tenuissimum</i>	Mixed-up Pixie-cup				S2S3	4	3.8 ± 6.0	NS
N	<i>Parmelia fertilis</i>	Fence-rail Lichen				S2S3	1	85.4 ± 0.0	NS
N	<i>Hypotrachyna minarum</i>	Birdnest Jellyskin Lichen				S2S3	4	68.0 ± 1.0	NS
N	<i>Racodium rupestre</i>	Fertile Shield Lichen				S2S3	2	96.9 ± 0.0	NS
N	<i>Usnea cavernosa</i>	Hairless-spined Shield				S2S3	1	10.4 ± 0.0	NS
N	<i>Fuscopannaria soredata</i>	Lichen				S2S3	18	9.2 ± 0.0	NS
N	<i>Hypotrachyna revoluta</i>	Granulating Loop Lichen				S2S3	3	74.1 ± 2.0	NS
N	<i>Cetraria arenaria</i>	Sand-loving Icelandmoss				S2S3	2	43.9 ± 1.0	NS
N	<i>Usnea flammea</i>	Lichen				S2S3	1	12.7 ± 0.0	NS
N	<i>Microlejeunea ulicina</i>	Coastal Bushy Beard Lichen				S3	6	89.5 ± 0.0	NS
N	<i>Anomodon tristis</i>	a pouncewort				S3	6	39.6 ± 3.0	NS
N	<i>Tetraplodon angustatus</i>	a Moss				S3	3	63.2 ± 0.0	NS
N	<i>Rostania occultata</i>	Toothed-leaved Nitrogen Moss				S3	1	65.5 ± 2.0	NS
N	<i>Collema nigrescens</i>	Crusted Tarpaper Lichen				S3	68	4.9 ± 0.0	NS
N	<i>Fuscopannaria ahlneri</i>	Blistered Tarpaper Lichen				S3	97	1.8 ± 0.0	NS
N	<i>Heterodermia squamulosa</i>	Corrugated Shingles Lichen				S3	30	61.2 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
N	<i>Scytinium lichenoides</i>	Tattered Jellyskin Lichen				S3	7	27.3 ± 0.0	NS
N	<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen				S3	48	4.5 ± 0.0	NS
N	<i>Nephroma bellum</i>	Naked Kidney Lichen				S3	11	6.7 ± 0.0	NS
N	<i>Placynthium nigrum</i>	Common Ink Lichen				S3	1	27.4 ± 3.0	NS
N	<i>Punctelia appalachensis</i>	Appalachian Speckleback Lichen				S3	14	73.7 ± 0.0	NS
N	<i>Viridothelium virens</i>					S3	8	56.2 ± 15.0	NS
N	<i>Ephebe lanata</i>	Waterside Rockshag Lichen				S3	1	70.0 ± 0.0	NS
N	<i>Phaeophyscia pusilloides</i>	Pompom-tipped Shadow Lichen				S3	1	74.4 ± 0.0	NS
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S3	8	10.4 ± 0.0	NS
N	<i>Drummondia prorepens</i>	a Moss				S3?	4	27.2 ± 5.0	NS
N	<i>Cladonia stygia</i>	Black-footed Reindeer Lichen				S3?	2	12.3 ± 0.0	NS
N	<i>Anomodon rugelii</i>	Rugel's Anomodon Moss				S3S4	6	56.0 ± 0.0	NS
N	<i>Dichelyma capillaceum</i>	Hairlike Dichelyma Moss				S3S4	7	57.6 ± 0.0	NS
N	<i>Dicranum leioneuron</i>	a Dicranum Moss				S3S4	2	11.7 ± 0.0	NS
N	<i>Splachnum ampullaceum</i>	Cruet Dung Moss				S3S4	1	89.2 ± 0.0	NS
N	<i>Thamnobryum alleghaniense</i>	a Moss				S3S4	1	72.5 ± 1.0	NS
N	<i>Schistidium agassizii</i>	Elf Bloom Moss				S3S4	2	77.7 ± 1.0	NS
N	<i>Hylocomiastrum pyrenaicum</i>	a Feather Moss				S3S4	1	59.8 ± 0.0	NS
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3S4	260	1.6 ± 0.0	NS
N	<i>Arctoparmelia incurva</i>	Finger Ring Lichen				S3S4	9	44.2 ± 0.0	NS
N	<i>Scytinium teretiunculum</i>	Curly Jellyskin Lichen				S3S4	6	10.2 ± 0.0	NS
N	<i>Leptogium acadense</i>	Acadian Jellyskin Lichen				S3S4	36	4.0 ± 0.0	NS
N	<i>Scytinium subtile</i>	Appressed Jellyskin Lichen				S3S4	24	4.1 ± 0.0	NS
N	<i>Cladonia floerkeana</i>	Gritty British Soldiers Lichen				S3S4	1	99.5 ± 0.0	NS
N	<i>Heterodermia speciosa</i>	Powdered Fringe Lichen				S3S4	46	3.7 ± 0.0	NS
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S3S4	331	1.1 ± 0.0	NS
N	<i>Melanohalea olivacea</i>	Spotted Camouflage Lichen				S3S4	2	11.8 ± 7.0	NS
N	<i>Parmotrema perlatum</i>	Powdered Ruffle Lichen				S3S4	46	5.6 ± 1.0	NS
N	<i>Peltigera hymenina</i>	Cloudy Pelt Lichen				S3S4	1	98.9 ± 2.0	NS
N	<i>Sphaerophorus fragilis</i>	Fragile Coral Lichen				S3S4	2	30.6 ± 0.0	NS
N	<i>Coccocarpia palmicola</i>	Salted Shell Lichen				S3S4	965	0.9 ± 0.0	NS
N	<i>Physcia caesia</i>	Blue-gray Rosette Lichen				S3S4	1	60.4 ± 20.0	NS
N	<i>Physcia tenella</i>	Fringed Rosette Lichen				S3S4	1	13.2 ± 1.0	NS
N	<i>Anaptychia palmulata</i>	Shaggy Fringed Lichen				S3S4	117	7.2 ± 0.0	NS
N	<i>Evernia prunastri</i>	Valley Oakmoss Lichen				S3S4	2	81.0 ± 1.0	NS
N	<i>Heterodermia neglecta</i>	Fringe Lichen				S3S4	234	1.6 ± 0.0	NS
P	<i>Rhynchospora macrostachya</i>	Tall Beakrush	Endangered	Endangered	Endangered	S1	57	45.0 ± 0.0	NS
P	<i>Lyonia ligustrina</i>	Maleberry	Endangered			S1	11	73.0 ± 0.0	NS
P	<i>Coreopsis rosea</i>	Pink Coreopsis	Endangered	Endangered	Endangered	S2	468	66.3 ± 0.0	NS
P	<i>Drosera filiformis</i>	Thread-leaved Sundew	Endangered	Endangered	Endangered	S2	919	46.2 ± 0.0	NS
P	<i>Clethra alnifolia</i>	Coast Pepper-Bush	Endangered	Threatened	Vulnerable	S2	298	62.5 ± 0.0	NS
P	<i>Sabatia kennedyana</i>	Plymouth Gentian	Endangered	Endangered	Endangered	S2S3	1266	63.8 ± 1.0	NS
P	<i>Juglans cinerea</i>	Butternut	Endangered	Endangered		SNA	1	55.8 ± 0.0	NS
P	<i>Fraxinus nigra</i>	Black Ash	Threatened		Threatened	S1S2	84	24.5 ± 0.0	NS
P	<i>Baccharis halimifolia</i>	Eastern Baccharis	Threatened	Threatened	Threatened	S2	174	70.1 ± 0.0	NS
P	<i>Hydrocotyle umbellata</i>	Water Pennywort	Special Concern	Special Concern	Endangered	S2	205	43.1 ± 13.0	NS
P	<i>Eleocharis tuberculosa</i>	Tuberclcd Spike-rush	Special Concern	Special Concern	Vulnerable	S2	517	31.0 ± 0.0	NS
P	<i>Lachnanthes caroliniana</i>	Redroot	Special Concern	Special Concern	Vulnerable	S2	1470	40.8 ± 0.0	NS
P	<i>Lophiola aurea</i>	Goldencrest	Special Concern	Special Concern	Vulnerable	S2	798	25.3 ± 0.0	NS
P	<i>Lilaeopsis chinensis</i>	Eastern Lilaeopsis	Special	Special Concern	Vulnerable	S3	186	31.7 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	<i>Scirpus longii</i>	Long's Bulrush	Concern Special Concern		Vulnerable	S3	733	4.5 ± 0.0	NS
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S3	2	94.2 ± 0.0	NS
P	<i>Toxicodendron vernix</i>	Poison Sumac				S1	41	46.3 ± 0.0	NS
P	<i>Turritis glabra</i>	Tower Mustard				S1	1	99.1 ± 0.0	NS
P	<i>Lobelia spicata</i>	Pale-Spiked Lobelia				S1	1	68.1 ± 50.0	NS
P	<i>Stellaria crassifolia</i>	Fleshy Stitchwort				S1	1	26.4 ± 2.0	NS
P	<i>Trichostema dichotomum</i>	Forked Bluecurls				S1	6	61.5 ± 0.0	NS
P	<i>Podostemum ceratophyllum</i>	Horn-leaved Riverweed				S1	4	74.3 ± 0.0	NS
P	<i>Lysimachia minima</i>	Chaffweed				S1	1	62.0 ± 0.0	NS
P	<i>Amelanchier nantucketensis</i>	Nantucket Serviceberry				S1	1	27.8 ± 0.0	NS
P	<i>Carex digitalis</i>	Slender Wood Sedge				S1	4	54.7 ± 0.0	NS
P	<i>Carex laxiflora</i>	Loose-Flowered Sedge				S1	2	60.7 ± 10.0	NS
P	<i>Carex ormostachya</i>	Necklace Spike Sedge				S1	2	80.6 ± 0.0	NS
P	<i>Cyperus diandrus</i>	Low Flatsedge				S1	7	69.6 ± 0.0	NS
P	<i>Fimbristylis autumnalis</i>	Slender Fimbry				S1	3	51.8 ± 0.0	NS
P	<i>Rhynchospora capillacea</i>	Slender Beakrush				S1	1	72.3 ± 0.0	NS
P	<i>Scirpus atrovirens</i>	Dark-green Bulrush				S1	1	92.1 ± 0.0	NS
P	<i>Blysmopsis rufa</i>	Red Bulrush				S1	1	93.6 ± 1.0	NS
P	<i>Schoenoplectus torreyi</i>	Torrey's Bulrush				S1	8	51.0 ± 0.0	NS
P	<i>Sisyrinchium fuscatum</i>	Coastal Plain Blue-eyed-grass				S1	6	44.8 ± 0.0	NS
P	<i>Juncus brachycephalus</i>	Small-Head Rush				S1	2	98.8 ± 1.0	NS
P	<i>Juncus secundus</i>	Secund Rush				S1	2	51.3 ± 1.0	NS
P	<i>Spiranthes casei var. casei</i>	Case's Ladies'-Tresses				S1	1	35.9 ± 0.0	NS
P	<i>Dichanthelium xanthophyllum</i>	Slender Panic Grass				S1	9	67.1 ± 1.0	NS
P	<i>Torreyochloa pallida var. pallida</i>	Pale False Manna Grass				S1	1	97.9 ± 0.0	NS
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S1	2	81.5 ± 0.0	NS
P	<i>Dryopteris goldieana</i>	Goldie's Woodfern				S1	1	78.9 ± 1.0	NS
P	<i>Solidago hispida</i>	Hairy Goldenrod				S1?	1	88.2 ± 7.0	NS
P	<i>Carex pensylvanica</i>	Pennsylvania Sedge				S1?	1	65.7 ± 10.0	NS
P	<i>Bolboschoenus robustus</i>	Sturdy Bulrush				S1?	1	86.6 ± 7.0	NS
P	<i>Panicum dichotomiflorum ssp. puritanorum</i>	Spreading Panicgrass				S1?	18	34.5 ± 0.0	NS
P	<i>Crocanthemum canadense</i>	Long-branched Frostweed			Endangered	S1S2	21	42.0 ± 0.0	NS
P	<i>Cornus suecica</i>	Swedish Bunchberry				S1S2	2	10.9 ± 0.0	NS
P	<i>Proserpinaca intermedia</i>	Intermediate Mermaidweed				S1S2	5	39.7 ± 5.0	NS
P	<i>Carex haydenii</i>	Hayden's Sedge				S1S2	2	64.4 ± 0.0	NS
P	<i>Calamagrostis stricta ssp. stricta</i>	Slim-stemmed Reed Grass				S1S2	1	94.8 ± 0.0	NS
P	<i>Euphrasia farlowii</i>	Farlow's Eyebright				S1S3	2	57.5 ± 0.0	NS
P	<i>Carex vacillans</i>	Estuarine Sedge				S1S3	1	13.7 ± 0.0	NS
P	<i>Antennaria parlinii ssp. fallax</i>	Parlin's Pussytoes				S2	13	55.2 ± 0.0	NS
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	20	11.2 ± 5.0	NS
P	<i>Desmodium canadense</i>	Canada Tick-trefoil				S2	7	50.3 ± 7.0	NS
P	<i>Hylodesmum glutinosum</i>	Large Tick-trefoil				S2	4	58.8 ± 0.0	NS
P	<i>Conopholis americana</i>	American Cancer-root				S2	47	53.3 ± 0.0	NS
P	<i>Anemonastrum canadense</i>	Canada Anemone				S2	5	40.3 ± 1.0	NS
P	<i>Hepatica americana</i>	Round-lobed Hepatica				S2	2	67.2 ± 1.0	NS
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S2	3	14.7 ± 0.0	NS
P	<i>Galium boreale</i>	Northern Bedstraw				S2	3	85.6 ± 0.0	NS
P	<i>Agalinis maritima</i>	Saltmarsh Agalinis				S2	51	71.2 ± 0.0	NS
P	<i>Juncus greenii</i>	Greene's Rush				S2	6	60.8 ± 1.0	NS
P	<i>Juncus alpinoarticulatus ssp.</i>	Northern Green Rush				S2	1	89.4 ± 0.0	NS

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P	<i>americanus</i> <i>Platanthera flava</i> var. <i>flava</i>	Southern Rein Orchid				S2	418	28.0 ± 7.0	NS
P	<i>Platanthera flava</i> var. <i>herbiola</i>	Pale Green Orchid				S2	9	39.4 ± 0.0	NS
P	<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S2	3	79.3 ± 0.0	NS
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S2	35	66.9 ± 0.0	NS
P	<i>Piptatheropsis pungens</i>	Slender Ricegrass				S2	12	22.4 ± 10.0	NS
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S2?	7	13.0 ± 0.0	NS
P	<i>Rumex persicarioides</i>	Peach-leaved Dock				S2?	5	6.5 ± 1.0	NS
P	<i>Thuja occidentalis</i>	Eastern White Cedar			Vulnerable	S2S3	237	66.5 ± 0.0	NS
P	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				S2S3	1	87.9 ± 1.0	NS
P	<i>Eutrochium dubium</i>	Coastal Plain Joe Pye Weed				S2S3	187	44.5 ± 7.0	NS
P	<i>Lactuca hirsuta</i>	Hairy Lettuce				S2S3	6	44.5 ± 5.0	NS
P	<i>Oxybasis rubra</i>	Red Goosefoot				S2S3	3	11.9 ± 0.0	NS
P	<i>Hypericum majus</i>	Large St John's-wort				S2S3	2	43.2 ± 1.0	NS
P	<i>Hypericum x dissimulatum</i>	Disguised St. John's-wort				S2S3	10	29.3 ± 0.0	NS
P	<i>Euphorbia polygonifolia</i>	Seaside Spurge				S2S3	19	8.4 ± 3.0	NS
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S2S3	8	39.3 ± 7.0	NS
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2S3	3	57.3 ± 1.0	NS
P	<i>Oenothera fruticosa</i> ssp. <i>tetragona</i>	Narrow-leaved Evening Primrose				S2S3	9	10.9 ± 1.0	NS
P	<i>Polygala polygama</i>	Racemed Milkwort				S2S3	17	61.2 ± 0.0	NS
P	<i>Polygonum aviculare</i> ssp. <i>buxiforme</i>	Box Knotweed				S2S3	2	57.1 ± 0.0	NS
P	<i>Polygonum oxyspermum</i> ssp. <i>raii</i>	Ray's Knotweed				S2S3	15	9.9 ± 5.0	NS
P	<i>Rumex triangulivalvis</i>	Triangular-valve Dock				S2S3	1	66.1 ± 1.0	NS
P	<i>Caltha palustris</i>	Yellow Marsh Marigold				S2S3	1	79.1 ± 0.0	NS
P	<i>Amelanchier fernaldii</i>	Fernald's Serviceberry				S2S3	2	21.9 ± 1.0	NS
P	<i>Potentilla canadensis</i>	Canada Cinquefoil				S2S3	15	16.0 ± 3.0	NS
P	<i>Galium obtusum</i>	Blunt-leaved Bedstraw				S2S3	23	45.3 ± 0.0	NS
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S2S3	47	66.9 ± 0.0	NS
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	1	51.9 ± 7.0	NS
P	<i>Carex houghtoniana</i>	Houghton's Sedge				S2S3	7	29.8 ± 0.0	NS
P	<i>Carex hystericina</i>	Porcupine Sedge				S2S3	1	82.4 ± 1.0	NS
P	<i>Carex longii</i>	Long's Sedge				S2S3	16	30.7 ± 7.0	NS
P	<i>Eleocharis ovata</i>	Ovate Spikerush				S2S3	2	56.9 ± 0.0	NS
P	<i>Scirpus pedicellatus</i>	Stalked Bulrush				S2S3	1	98.2 ± 5.0	NS
P	<i>Vallisneria americana</i>	Wild Celery				S2S3	11	45.3 ± 0.0	NS
P	<i>Najas gracillima</i>	Thread-Like Naiad				S2S3	20	28.0 ± 7.0	NS
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S2S3	77	39.5 ± 11.0	NS
P	<i>Spiranthes casei</i>	Case's Ladies'-Tresses				S2S3	4	49.0 ± 0.0	NS
P	<i>Spiranthes casei</i> var. <i>novaescotiae</i>	Case's Ladies'-Tresses				S2S3	18	4.9 ± 0.0	NS
P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2S3	4	58.4 ± 7.0	NS
P	<i>Botrychium lanceolatum</i> ssp. <i>angustisegmentum</i>	Narrow Triangle Moonwort				S2S3	3	75.8 ± 1.0	NS
P	<i>Botrychium simplex</i>	Least Moonwort				S2S3	4	38.1 ± 1.0	NS
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	9	12.5 ± 0.0	NS
P	<i>Potamogeton pulcher</i>	Spotted Pondweed			Vulnerable	S3	53	39.3 ± 0.0	NS
P	<i>Conioselinum chinense</i>	Chinese Hemlock-parsley				S3	2	14.4 ± 0.0	NS
P	<i>Hieracium robinsonii</i>	Robinson's Hawkweed				S3	3	87.4 ± 1.0	NS
P	<i>Iva frutescens</i>	Big-leaved Marsh-elder				S3	59	69.4 ± 0.0	NS
P	<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S3	4	92.6 ± 1.0	NS
P	<i>Symphyotrichum boreale</i>	Boreal Aster				S3	15	20.3 ± 5.0	NS
P	<i>Symphyotrichum undulatum</i>	Wavy-leaved Aster				S3	125	36.9 ± 1.0	NS
P	<i>Alnus serrulata</i>	Smooth Alder				S3	839	5.8 ± 3.0	NS
P	<i>Betula michauxii</i>	Michaux's Dwarf Birch				S3	43	18.5 ± 0.0	NS

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P	<i>Cardamine parviflora</i>	Small-flowered Bittercress				S3	1	62.1 ± 0.0	NS
P	<i>Mononeuria groenlandica</i>	Greenland Stitchwort				S3	70	60.5 ± 0.0	NS
P	<i>Sagina nodosa</i>	Knotted Pearlwort				S3	38	8.0 ± 5.0	NS
P	<i>Sagina nodosa ssp. borealis</i>	Knotted Pearlwort				S3	2	12.1 ± 1.0	NS
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S3	1	30.7 ± 5.0	NS
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S3	4	50.6 ± 0.0	NS
P	<i>Crassula aquatica</i>	Water Pygmyweed				S3	2	27.5 ± 0.0	NS
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	14	32.3 ± 5.0	NS
P	<i>Utricularia resupinata</i>	Inverted Bladderwort				S3	40	46.5 ± 0.0	NS
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	2	36.0 ± 0.0	NS
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	3	70.3 ± 0.0	NS
P	<i>Persicaria arifolia</i>	Halberd-leaved Tearthumb				S3	10	60.6 ± 0.0	NS
P	<i>Plantago rugelii</i>	Rugel's Plantain				S3	1	77.1 ± 0.0	NS
P	<i>Primula laurentiana</i>	Laurentian Primrose				S3	7	87.9 ± 7.0	NS
P	<i>Samolus parviflorus</i>	Seaside Brookweed				S3	82	26.5 ± 0.0	NS
P	<i>Anemone virginiana</i>	Virginia Anemone				S3	1	67.1 ± 0.0	NS
P	<i>Cephalanthus occidentalis</i>	Common Buttonbush				S3	1959	6.5 ± 7.0	NS
P	<i>Salix pedicellaris</i>	Bog Willow				S3	91	37.5 ± 1.0	NS
P	<i>Salix sericea</i>	Silky Willow				S3	169	26.8 ± 3.0	NS
P	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel				S3	7	27.5 ± 0.0	NS
P	<i>Pilea pumila</i>	Dwarf Clearweed				S3	1	99.6 ± 0.0	NS
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S3	1	24.0 ± 1.0	NS
P	<i>Carex cryptolepis</i>	Hidden-scaled Sedge				S3	5	11.4 ± 2.0	NS
P	<i>Carex lupulina</i>	Hop Sedge				S3	33	39.3 ± 0.0	NS
P	<i>Carex swanii</i>	Swan's Sedge				S3	9	31.8 ± 0.0	NS
P	<i>Carex tenera</i>	Tender Sedge				S3	3	34.5 ± 0.0	NS
P	<i>Carex tribuloides</i>	Blunt Broom Sedge				S3	1	56.9 ± 0.0	NS
P	<i>Eleocharis nitida</i>	Quill Spikerush				S3	2	85.8 ± 7.0	NS
P	<i>Eleocharis flavescens var. olivacea</i>	Bright-green Spikerush				S3	19	49.7 ± 0.0	NS
P	<i>Eleocharis rostellata</i>	Beaked Spikerush				S3	73	49.7 ± 0.0	NS
P	<i>Schoenoplectus americanus</i>	Olney's Bulrush				S3	98	62.7 ± 0.0	NS
P	<i>Neottia bifolia</i>	Southern Twayblade				S3	106	6.6 ± 0.0	NS
P	<i>Platanthera flava</i>	Southern Rein-Orchid				S3	55	4.9 ± 0.0	NS
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	3	78.2 ± 5.0	NS
P	<i>Platanthera hookeri</i>	Hooker's Orchid				S3	10	12.6 ± 0.0	NS
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S3	3	44.0 ± 0.0	NS
P	<i>Piptatheropsis canadensis</i>	Canada Ricegrass				S3	24	4.5 ± 0.0	NS
P	<i>Stuckenia filiformis</i>	Thread-leaved Pondweed				S3	1	92.1 ± 7.0	NS
P	<i>Sceptridium dissectum</i>	Dissected Moonwort				S3	6	71.4 ± 0.0	NS
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	6	26.6 ± 0.0	NS
P	<i>Persicaria amphibia var. emersa</i>	Long-root Smartweed				S3?	29	39.9 ± 0.0	NS
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S3?	40	8.6 ± 0.0	NS
P	<i>Diphasiastrum x sabinifolium</i>	Savin-leaved Ground-cedar				S3?	2	60.8 ± 0.0	NS
P	<i>Bidens vulgata</i>	Tall Beggarticks				S3S4	1	89.3 ± 0.0	NS
P	<i>Hieracium paniculatum</i>	Panicked Hawkweed				S3S4	23	50.1 ± 0.0	NS
P	<i>Bidens beckii</i>	Water Beggarticks				S3S4	28	47.1 ± 0.0	NS
P	<i>Vaccinium boreale</i>	Northern Blueberry				S3S4	1	72.3 ± 0.0	NS
P	<i>Vaccinium cespitosum</i>	Dwarf Bilberry				S3S4	26	72.3 ± 0.0	NS
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S3S4	759	11.9 ± 0.0	NS
P	<i>Fagus grandifolia</i>	American Beech				S3S4	182	25.7 ± 3.0	NS
P	<i>Bartonia virginica</i>	Yellow Bartonia				S3S4	100	7.5 ± 0.0	NS
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S3S4	108	35.9 ± 0.0	NS
P	<i>Decodon verticillatus</i>	Swamp Loosestrife				S3S4	340	23.9 ± 0.0	NS
P	<i>Nuphar microphylla</i>	Small Yellow Pond-lily				S3S4	6	11.4 ± 2.0	NS
P	<i>Persicaria pensylvanica</i>	Pennsylvania Smartweed				S3S4	2	30.6 ± 5.0	NS

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P	<i>Fallopia scandens</i>	Climbing False Buckwheat				S3S4	5	13.2 ± 0.0	NS
P	<i>Pyrola asarifolia</i>	Pink Pyrola				S3S4	1	93.6 ± 7.0	NS
P	<i>Amelanchier spicata</i>	Running Serviceberry				S3S4	38	11.0 ± 5.0	NS
P	<i>Galium aparine</i>	Common Bedstraw				S3S4	15	13.3 ± 0.0	NS
P	<i>Limosella australis</i>	Southern Mudwort				S3S4	21	22.6 ± 5.0	NS
P	<i>Veronica serpyllifolia</i>	Thyme-Leaved Speedwell				S3S4	15	30.8 ± 1.0	NS
P	<i>Ulmus americana</i>	White Elm				S3S4	12	47.4 ± 0.0	NS
P	<i>Verbena hastata</i>	Blue Vervain				S3S4	37	40.3 ± 1.0	NS
P	<i>Viola sagittata var. ovata</i>	Arrow-Leaved Violet				S3S4	29	28.1 ± 0.0	NS
P	<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage				S3S4	423	47.5 ± 0.0	NS
P	<i>Carex argyrantha</i>	Silvery-flowered Sedge				S3S4	23	29.6 ± 4.0	NS
P	<i>Sisyrinchium atlanticum</i>	Eastern Blue-Eyed-Grass				S3S4	414	8.7 ± 0.0	NS
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3S4	17	1.3 ± 0.0	NS
P	<i>Juncus acuminatus</i>	Sharp-Fruit Rush				S3S4	16	40.1 ± 5.0	NS
P	<i>Juncus subcaudatus</i>	Woods-Rush				S3S4	25	36.3 ± 0.0	NS
P	<i>Goodyera repens</i>	Lesser Rattlesnake-plantain				S3S4	17	6.5 ± 7.0	NS
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	8	5.9 ± 1.0	NS
P	<i>Platanthera obtusata</i>	Blunt-leaved Orchid				S3S4	21	6.5 ± 10.0	NS
P	<i>Platanthera orbiculata</i>	Small Round-leaved Orchid				S3S4	44	9.5 ± 0.0	NS
P	<i>Dichantherium clandestinum</i>	Deer-tongue Panic Grass				S3S4	253	47.4 ± 0.0	NS
P	<i>Coleataenia longifolia</i>	Long-leaved Panicgrass				S3S4	2382	23.2 ± 0.0	NS
P	<i>Panicum philadelphicum</i>	Philadelphia Panicgrass				S3S4	29	24.0 ± 0.0	NS
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S3S4	2	92.2 ± 1.0	NS
P	<i>Lorinseria areolata</i>	Netted Chain Fern				S3S4	334	11.6 ± 0.0	NS
P	<i>Diphasiastrum complanatum</i>	Northern Ground-cedar				S3S4	2	67.2 ± 0.0	NS
P	<i>Sceptridium multifidum</i>	Leathery Moonwort				S3S4	6	6.5 ± 10.0	NS
P	<i>Botrychium matricariifolium</i>	Daisy-leaved Moonwort				S3S4	1	6.5 ± 10.0	NS
P	<i>Bidens discoides</i>	Swamp Beggarticks				SH	1	70.4 ± 0.0	NS
P	<i>Dichantherium meridionale</i>	Matting Witchgrass				SH	2	77.5 ± 2.0	NS

5.1 SOURCE BIBLIOGRAPHY (100 km)

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

# recs	CITATION
17985	Morrison, Guy. 2011. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Ottawa, 15939 surveys. 86171 recs.
7626	McNeil, J.A. 2010. Blandings Turtle (<i>Emydoidea blandingii</i>) sightings, 1946-2009. Parks Canada, 12,871 recs of 597+ individuals.
4520	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
2912	Paquet, Julie. 2018. Atlantic Canada Shorebird Survey (ACSS) database 2012-2018. Environment Canada, Canadian Wildlife Service.
1842	Pardieck, K.L., Ziolkowski Jr., D.J., Lutmerding, M., Aponte, V.I., and Hudson, M.-A.R. 2020. North American Breeding Bird Survey Dataset 1966 - 2019: U.S. Geological Survey data release, https://doi.org/10.5066/P9J6QUF6
1696	McNeil, J.A. 2010. Ribbonsnake (<i>Thamnophis sauritus</i>) sightings, 1900-2009. Parks Canada, 2521 recs of 716+ individuals.
1687	Blaney, C.S.; Mazerolle, D.M. 2010. Fieldwork 2010. Atlantic Canada Conservation Data Centre. Sackville NB, 15508 recs.
1671	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
1367	Belliveau, A. 2012. 2012 Atlantic Coastal Plain Flora observations. Mersey Tobeatic Research Institute, 1543.
1367	Blaney, C.S.; Mazerolle, D.M. 2012. Fieldwork 2012. Atlantic Canada Conservation Data Centre, 13,278 recs.
1235	iNaturalist. 2020. iNaturalist Data Export 2020. iNaturalist.org and iNaturalist.ca, Web site: 128728 recs.
1159	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2013. Atlantic Canada Conservation Data Centre Fieldwork 2013. Atlantic Canada Conservation Data Centre, 9000+ recs.
946	Toms, Brad. 2012. Atlantic Coastal Plain Flora records, 2011. Mersey-Tobeatic Research Institute, 1109 recs.
914	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2014. Atlantic Canada Conservation Data Centre Fieldwork 2014. Atlantic Canada Conservation Data Centre, # recs.
877	Blaney, C.S. & Mazerolle, D.M. 2011. Atlantic Coastal Plain flora species at risk surveys for Mersey Tobeatic Research Institute. Atlantic Canada Conservation Data Centre, 1724 recs.
860	Phinney, Lori. 2020. Pre- and post White-nose Syndrome bat acoustic monitoring, NS. Mersey Tobeatic Research Institute, 1279 recs.
739	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
707	Paquet, Julie. 2019. Atlantic Canada Shorebird Survey ACSS database for 2019. Environment Canada, Canadian Wildlife Service.
689	McNeil, J.A. 2016. Blandings Turtle (<i>Emydoidea blandingii</i>), Eastern Ribbonsnake (<i>Thamnophis sauritus</i>), Wood Turtle (<i>Glyptemys insculpta</i>), and Snapping Turtle (<i>Chelydra serpentina</i>) sightings, 2016. Mersey

# recs	CITATION
	Tobeatic Research Institute, 774 records.
661	Toms, Brad. 2011. Atlantic Coastal Plain Flora records 2010. Mersey-Tobeatic Research Institute, 1074 recs.
635	Blaney, C.S.; Spicer, C.D.; Popma, T.M.; Hanel, C. 2002. Fieldwork 2002. Atlantic Canada Conservation Data Centre. Sackville NB, 2252 recs.
632	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-05-25]. Mersey Tobeatic Research Institute, 668 recs.
622	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2015. Atlantic Canada Conservation Data Centre Fieldwork 2015. Atlantic Canada Conservation Data Centre, # recs.
595	Blaney, C.S.; Mazerolle, D.M.; Hill, N.M. 2011. Nova Scotia Crown Share Land Legacy Trust Fieldwork. Atlantic Canada Conservation Data Centre, 5022 recs.
584	Neily, T.H. 2017. Nova Scotia lichen records. Mersey Tobeatic Research Institute.
563	Cameron, R.P. 2009. Cyanolichen database. Nova Scotia Environment & Labour, 1724 recs.
542	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville, 3344 recs, 1228 new.
538	Belliveau, A.G. 2020. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2019, 2020. E.C. Smith Herbarium.
478	Clayden, S. Digitization of Wolfgang Maass Nova Scotia forest lichen collections, 1964-2004. New Brunswick Museum. 2018.
442	McNeil, J.A. 2019. Blanding's Turtle records, 2017. Mersey Tobeatic Research Institute, 372 recs.
440	Hill, N.M. 1994. Status report on the Long's bulrush <i>Scirpus longii</i> in Canada. Committee on the Status of Endangered Wildlife in Canada, 7 recs.
412	Toms, B. & Hill, N.M.; Neily, T. 2014. Atlantic Coastal Plain Flora records, 2011. Mersey Tobeatic Research Institute, 430 recs.
388	eBird. 2020. eBird Basic Dataset. Version: EBD_relNov-2019. Ithaca. New York. Nov 2019, Cape Breton Bras d'Or Lakes Watershed subset. Cornell Lab of Ornithology.
384	Hicks, Andrew. 2009. Coastal Waterfowl Surveys Database, 2000-08. Canadian Wildlife Service, Sackville, 46488 recs (11149 non-zero).
372	McNeil, J.A. 2018. Blanding's Turtle records, 2018. Mersey Tobeatic Research Institute, 372 recs.
360	Benjamin, L.K. (compiler). 2012. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 4965 recs.
350	MacDonald, E.C. 2018. Piping Plover nest records from 2010-2017. Canadian Wildlife Service.
346	Belliveau, A.G. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2016. Atlantic Canada Conservation Data Centre, 10695 recs.
314	Neily, T.H. & Pepper, C.; Toms, B. 2013. Nova Scotia lichen location database. Mersey Tobeatic Research Institute, 1301 recs.
306	McNeil, J.A. 2015. Blandings Turtle (<i>Emydoidea blandingii</i>), Eastern Ribbonsnake (<i>Thamnophis sauritus</i>), and Snapping Turtle (<i>Chelydra serpentina</i>) sightings, 2015. Mersey Tobeatic Research Institute.
304	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.
298	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: http://luxor.acadiu.ca/library/Herbarium/project/ . 582 recs.
290	Blaney, C.S.; Mazerolle, D.M.; Oberndorfer, E. 2007. Fieldwork 2007. Atlantic Canada Conservation Data Centre. Sackville NB, 13770 recs.
277	Scott, F.W. 2002. Nova Scotia Herpetofauna Atlas Database. Acadia University, Wolfville NS, 8856 recs.
249	Smith, D. 2013. Personal communication concerning <i>Anguilla rostrata</i> trapping results in Kejimikujik NP, NS. Winter 2013. Pers. comm.
245	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-03-18]. Mersey Tobeatic Research Institute.
230	Westwood, A., Staicer, C. 2016. Nova Scotia landbird Species at Risk observations. Dalhousie University.
223	Blaney, C.S.; Mazerolle, D.M. 2008. Fieldwork 2008. Atlantic Canada Conservation Data Centre. Sackville NB, 13343 recs.
215	Amirault, D.L. & McKnight, J. 2003. Piping Plover Database 1991-2003. Canadian Wildlife Service, Sackville, unpublished data. 7 recs.
208	Pronych, G. & Wilson, A. 1993. Atlas of Rare Vascular Plants in Nova Scotia. Nova Scotia Museum, Halifax NS, I:1-168, II:169-331. 1446 recs.
205	Blaney, C.S.; Mazerolle, D.M. 2009. Fieldwork 2009. Atlantic Canada Conservation Data Centre. Sackville NB, 13395 recs.
202	Blaney, C.S. & Mazerolle, D.M. 2011. 2011 botanical surveys in Kejimikujik National Park. Atlantic Canada Conservation Data Centre, 820 recs.
199	Mazerolle, D.M. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
199	Neily, T.H. & Pepper, C.; Toms, B. 2015. Nova Scotia lichen location database [as of 2015-02-15]. Mersey Tobeatic Research Institute, 1691 records.
194	Wilhelm, S.I. et al. 2011. Colonial Waterbird Database. Canadian Wildlife Service, Sackville, 2698 sites, 9718 recs (8192 obs).
190	McNeil, J.A. 2019. Blanding's Turtle records, 2019. Mersey Tobeatic Research Institute.
189	McNeil, J.A. 2019. Eastern Painted Turtle trapping records, 2019. Mersey Tobeatic Research Institute.
181	Chapman, C.J. 2019. Atlantic Canada Conservation Data Centre 2019 botanical fieldwork. Atlantic Canada Conservation Data Centre, 11729 recs.
173	Belliveau, A.G. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
167	Belliveau, A.G. 2014. Plant Records from Southern and Central Nova Scotia. Atlantic Canada Conservation Data Centre, 919 recs.
166	Belliveau, A.G. 2018. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2018. E.C. Smith Herbarium, 6226 recs.
164	MacDonald, E.C. 2018. CWS Piping Plover Census, 2010-2017. Canadian Wildlife Service, 672 recs.
162	Toms, B. & Neily, T.; Belliveau, A.G.; Newell, R.; Mills, A.; Clapp, H.; Staicer, C.; Anderson, F.; Gray, C.; Beals, L. 2010. Inventory of Nature Conservancy of Canada Lands in Yarmouth and Shelburne Counties. Mersey Tobeatic Research Institute, approx. 1500 recs.
153	McNeil, J.A. 2014. Blandings Turtle (<i>Emydoidea blandingii</i>) and Snapping Turtle (<i>Chelydra serpentina</i>) sightings, 2014. Mersey Tobeatic Research Institute.
148	McNeil, J.A. 2011. Ribbonsnake (<i>Thamnophis sauritus</i>) sightings, 2010. Parks Canada, 148 recs of 70+ individuals.
139	Mackinnon, D.S. & O'Brien, M.K.H.; Cameron, R.P. 2002. Fieldwork 2000. Dept of Environment & Labour, Protected Areas Branch, 252 recs.
134	Blaney, C.S. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2018. Atlantic Canada Conservation Data Centre.
130	Keddy, C.J. 1989. Habitat securement for redroot, golden crest and Long's bulrush in Ponhook Lake, NS. World Wildlife Fund (Canada), 131 recs.
122	Brunelle, P.-M. (compiler). 2009. ADIP/MDDS Odonata Database: data to 2006 inclusive. Atlantic Dragonfly Inventory Program (ADIP), 24200 recs.
122	Cameron, R.P. 2011. Lichen observations, 2011. Nova Scotia Environment & Labour, 731 recs.
119	McNeil, J.A. 2020. Snapping Turtle and Eastern Painted Turtle records, 2020. Mersey Tobeatic Research Institute.
118	Neily, T.H. & Pepper, C.; Toms, B. 2018. Nova Scotia lichen database [as of 2018-03]. Mersey Tobeatic Research Institute.
113	Belland, R.J. Maritimes moss records from various herbarium databases. 2014.
113	Haughian, S.R. 2018. Description of <i>Fuscopannaria leucosticta</i> field work in 2017. New Brunswick Museum, 314 recs.
111	Toms, B. 2018. Bat Species data from www.batconservation.ca for Nova Scotia. Mersey Tobeatic Research Institute, 547 Records.
109	McNeil, J.A. 2020. Blanding's Turtle records, 2020. Mersey Tobeatic Research Institute.

# recs	CITATION
107	MacKinnon, D.S. 2005. Coastal Plains Flora GIS theme, 1999-2000. Dept of Environment & Labour, Protected Areas Branch, 109 shp files. 109 recs.
105	Bayne, D.Z. 2013. 2013 Plant observations from southwest Nova Scotia. Nova Scotia Department of Natural Resources, 122 recs.
103	Belliveau, A. 2013. Rare species records from Nova Scotia. Mersey Tobeatic Research Institute, 296 records. 296 recs.
103	Wilhelm, S.I. et al. 2019. Colonial Waterbird Database. Canadian Wildlife Service.
99	iNaturalist. 2018. iNaturalist Data Export 2018. iNaturalist.org and iNaturalist.ca, Web site: 11700 recs.
96	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2013.
95	Breen, A. 2019. 2019 Atlantic Whitefish observations. Coastal Action, 95 recs.
95	McNeil, J.A. 2019. Eastern Painted Turtle trapping records, 2017. Mersey Tobeatic Research Institute.
94	Blaney, C.S.; Mazerolle, D.M. 2011. Fieldwork 2011. Atlantic Canada Conservation Data Centre. Sackville NB.
92	Newell, R. & Neily, T.; Toms, B.; Proulx, G. et al. 2011. NCC Properties Fieldwork in NS: August-September 2010. Nature Conservancy Canada, 106 recs.
86	Munro, Marian K. Tracked lichen specimens, Nova Scotia Provincial Museum of Natural History Herbarium. Atlantic Canada Conservation Data Centre. 2019.
85	Benjamin, L.K. (compiler). 2001. Significant Habitat & Species Database. Nova Scotia Dept of Natural Resources, 15 spp, 224 recs.
81	Canadian Wildlife Service, Dartmouth. 2010. Piping Plover censuses 2007-09, 304 recs.
81	McMullin, R.T.; Anderson, F.; Clapp, H.; et al. 2019. Results from a rare lichen survey at Kejimikujik Seaside National Park in Nova Scotia, Canada. Canadian Museum of Nature, 83 recs.
79	Herman, T.B. & Power, T.D., Eaton, B. 1995. Population status of Blanding's Turtle (<i>Emydoidea blandingii</i>) in Nova Scotia. Can. Field-Nat., 109: 182-191. 79 recs.
76	Parks Canada. 2021. Species at Risk observations from 2019-2020 in Kejimikujik National Park and Historic Site. Parks Canada, 76 records.
76	Robinson, S.L. 2014. 2013 Field Data. Atlantic Canada Conservation Data Centre.
72	Staicer, C. & Bliss, S.; Achenbach, L. 2017. Occurrences of tracked breeding birds in forested wetlands. , 303 records.
68	McNeil, J.A. 2017. Updates to Blanding's Turtle database, 1984-2014. Mersey Tobeatic Research Institute.
66	Blaney, C.S. 2020. Sean Blaney 2020 field data. Atlantic Canada Conservation Data Centre, 4407 records.
66	Richardson, D., Anderson, F., Cameron, R, McMullin, T., Clayden, S. 2014. Field Work Report on Black Foam Lichen (<i>Anzia colpodes</i>). COSEWIC.
65	Roland, A.E. 1976. The Coastal Plain Flora of Kejimikujik National Park. Parks Canada Report, 238 pp.
64	McNeil, J.A. 2019. Snapping Turtle records, 2019. Mersey Tobeatic Research Institute.
63	Blaney, C.S.; Mazerolle, D.M.; Klymko, J; Spicer, C.D. 2006. Fieldwork 2006. Atlantic Canada Conservation Data Centre. Sackville NB, 8399 recs.
63	McNeil, J.A. 2013. Ribbonsnake (<i>Thamnophis sauritus</i>) sightings, 2012 . Parks Canada, 63 records of 26+ individuals.
61	Churchill, J.L. 2019. Atlantic Canada Conservation Data Centre Fieldwork 2019. Atlantic Canada Conservation Data Centre.
60	Klymko, J. 2018. Maritimes Butterfly Atlas database. Atlantic Canada Conservation Data Centre.
56	Blaney, C.S. 2019. Sean Blaney 2019 field data. Atlantic Canada Conservation Data Centre, 4407 records.
56	Blaney, C.S.; Spicer, C.D. 2001. Fieldwork 2001. Atlantic Canada Conservation Data Centre. Sackville NB, 981 recs.
56	Blaney, C.S.; Spicer, C.D.; Mazerolle, D.M. 2005. Fieldwork 2005. Atlantic Canada Conservation Data Centre. Sackville NB, 2333 recs.
55	Roland, A.E. & Smith, E.C. 1969. The Flora of Nova Scotia, 1st Ed. Nova Scotia Museum, Halifax, 743pp.
51	Klymko, J.J.D.; Robinson, S.L. 2014. 2013 field data. Atlantic Canada Conservation Data Centre.
50	Burnie, B. 2013. 2013 <i>Scirpus longii</i> field data. Mount Saint Vincent University, 51 recs.
48	Blaney, C.S.; Spicer, C.D.; Rothfels, C. 2004. Fieldwork 2004. Atlantic Canada Conservation Data Centre. Sackville NB, 1343 recs.
48	NatureServe Canada. 2019. iNaturalist Maritimes Butterfly Records. iNaturalist.org and iNaturalist.ca.
48	Riley, J. 2019. Digby County lichen observations. Pers. comm. to J.L. Churchill, 50 recs.
45	Bayne, D.M. 2007. Atlantic Coastal Plain Flora record, 2004-06. Nova Scotia Nature Trust. Pers. comm. to C.S. Blaney, 57 recs.
41	MacKinnon, D.S. & Maass, O.C. 1995. Fieldwork 1995. Dept Natural Resources, Parks Division, 45 recs.
41	MacKinnon, D.S. 1999. Fieldwork 1999. Dept of Environment and Labour, Protected Areas Branch, 48 recs.
40	iNaturalist. 2020. iNaturalist butterfly records selected for the Maritimes Butterfly Atlas. iNaturalist.
39	Chapman, C.J. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 11171 recs.
38	Atlantic Canada Conservation Data Centre. 2020. Cape LaHave Island observations from August 2020. Atlantic Canada Conservation Data Centre, 605 records.
38	Blaney, C.S. 2017. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
37	Patrick, A.; Horne, D.; Noseworthy, J. et al. 2017. Field data for Nova Scotia and New Brunswick, 2015 and 2017. Nature Conservancy of Canada.
36	Blaney, C.S.; Mazerolle, D.M.; Hill, N.M. 2011. Fieldwork for <i>Sabatia kennedyana</i> & <i>Coreopsis rosea</i> COSEWIC status reports.
36	Chapman-Lam, C.J. 2021. Atlantic Canada Conservation Data Centre 2020 botanical fieldwork. Atlantic Canada Conservation Data Centre, 17309 recs.
36	McNeil, J.A. 2017. Eastern Ribbonsnake (<i>Thamnophis sauritus</i>) sightings, 2017. Mersey Tobeatic Research Institute, 36 recs.
35	Roland, A.E. 1980. Checklist of Vascular Plants of Kejimikujik National Park in Lichens, Liverworts, Mosses and Flowering Plants of Kejimikujik National Park. Roland, A.E. (ed.) Parks Canada Report, pp. 52-140, 160 pp.
33	Bayne, D.Z. 2014. 2014 rare species observations from southwest Nova Scotia. Nova Scotia Department of Natural Resources, 46 recs.
33	Brazner, J. 2016. Nova Scotia Forested Wetland Bird Surveys. Nova Scotia Department of Lands and Forestry.
33	Nussey, Pat & NCC staff. 2019. AEI tracked species records, 2016-2019. Chapman, C.J. (ed.) Atlantic Canada Conservation Data Centre, 333.
33	Taylor, P.D. 2006. Long-term monitoring of <i>Listera australis</i> in southwestern Nova Scotia; summary report for 2006, year 3. Acadia University, 33.
32	Benjamin, L.K. 2012. NSDNR fieldwork & consultant reports 2008-2012. Nova Scotia Dept Natural Resources, 196 recs.
32	Newell, R.E. 2000. <i>Eleocharis tuberculosa</i> records in NS, 1994-99. Acadia University, Wolfville NS, Pers. comm. to S.H. Gerriets, Feb. 11. 32 recs.
31	MacKinnon, D.S. 2001. Fieldwork 2001. Dept of Environment & Labour, Protected Areas Branch, 43 recs.
31	Mazerolle, D.M. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 13515 recs.
31	Phinney, L. 2019. Little Brown Myotis maternal colony counts and birdSAR, 2019. Mersey Tobeatic Research Institute.
30	Frittaion, C. 2012. NSNT 2012 Field Observations. Nova Scotia Nature Trust, Pers comm. to S. Blaney Feb. 7, 34 recs.

# recs	CITATION
29	Manthorne, A. 2014. MaritimesSwiftwatch Project database 2013-2014. Bird Studies Canada, Sackville NB, 326 recs.
29	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.
26	Bryson, I. 2020. Nova Scotia and Newfoundland rare species observations, 2018-2020. Nova Scotia Environment.
26	LaPaix, R.W.; Crowell, M.J.; MacDonald, M. 2011. Stantec rare plant records, 2010-11. Stantec Consulting, 334 recs.
25	Klymko, J.J.D. 2018. 2017 field data. Atlantic Canada Conservation Data Centre.
25	Layberry, R.A. & Hall, P.W., LaFontaine, J.D. 1998. The Butterflies of Canada. University of Toronto Press. 280 pp+plates.
25	McNeil, J.A. 2019. Snapping Turtle records, 2017. Mersey Tobeatic Research Institute.
24	Bayne, D.M., Cameron, R.C. 2014. 2014 Lichen records near Little Bon Mature Lake, Queens NS. NS Department of Natural Resources.
24	Brodgers, H.G. 2006. Unpublished data. , 24 recs.
23	Richardson, D., Anderson, F., Cameron, R, Pepper, C., Clayden, S. 2015. Field Work Report on the Wrinkled Shingle lichen (<i>Pannaria lurida</i>). COSEWIC.
22	Breen, A. 2018. 2018 Atlantic Whitefish observations. Coastal Action.
21	Benjamin, L.K. (compiler). 2010. Baccharis halimifolia observation records. NS Dept of Natural Resources, 40.
20	Mersey Tobeatic Research Institute. 2021. 2020 Monarch records from the MTRI monitoring program. Mersey Tobeatic Research Institute, 72 records.
20	O'Grady, Sally. 2010. Water Pennywort in Kejimikujik National Park, 2010. Parks Canada, 20 shapefiles.
19	Benjamin, L.K. 2011. NSDNR fieldwork & consultant reports 1997, 2009-10. Nova Scotia Dept Natural Resources, 85 recs.
19	Richardson, Leif. 2018. Maritimes Bombus records from various sources. Richardson, Leif.
18	Cameron, R.P. 2017. 2017 rare species field data. Nova Scotia Environment, 64 recs.
18	Catling, P.M. 1981. Taxonomy of autumn-flowering <i>Spiranthes</i> species of southern Nova Scotia in Can. J. Bot. , 59:1250-1273. 30 recs.
18	Plissner, J.H. & Haig, S.M. 1997. 1996 International piping plover census. US Geological Survey, Corvallis OR, 231 pp.
17	MacKinnon, D.S. 2000. Fieldwork 2000. Dept of Environment and Labour, Protected Areas Branch, 17 recs.
17	McKendry, Karen. 2016. Rare species observations, 2016. Nova Scotia Nature Trust, 19 recs.
16	Holder, M. 2003. Assessment and update status report on the Eastern <i>Lilaeopsis</i> (<i>Lilaeopsis chinensis</i>) in Canada. Committee on the Status of Endangered Wildlife in Canada, 16 recs.
16	Hunsinger, J. 2021. Species at Risk records from Medway Community Forest Cooperative monitoring plots and baited game cameras, 2019-2020. Medway Community Forest Cooperative, 16 records.
16	Neily, T.H. Hectanooga, Nova Scotia Livenwort records. T.H. Neily. 2017.
16	Nova Scotia Nature Trust. 2013. Nova Scotia Nature Trust 2013 Species records. Nova Scotia Nature Trust, 95 recs.
16	Porter, C.J.M. 2014. Field work data 2007-2014. Nova Scotia Nature Trust, 96 recs.
15	Benjamin, L.K. 2009. NSDNR Fieldwork & Consultants Reports. Nova Scotia Dept Natural Resources, 143 recs.
15	Cameron, R.P. 2018. <i>Degelia plumbea</i> records. Nova Scotia Environment.
15	Klymko, J.J.D. 2012. Odonata specimens & observations, 2010. Atlantic Canada Conservation Data Centre, 425 recs.
15	Neily, T.H. Tom Neily NS Sphagnum records (2009-2014). T.H. Neily, Atlantic Canada Conservation Data Centre. 2019.
15	Toms, Brad. 2011. Species at Risk data from 2011 field surveys. Mersey Tobeatic Research Institute, 17 recs.
14	Bryson, I.C. 2020. Nova Scotia flora and lichen observations 2020. Nova Scotia Environment, 139 recs.
14	Klymko, J. 2019. Atlantic Canada Conservation Data Centre zoological fieldwork 2018. Atlantic Canada Conservation Data Centre.
14	McNeil, J.A. 2018. Snapping Turtle records, 2018. Mersey Tobeatic Research Institute.
14	Oldham, M.J. 2000. Oldham database records from Maritime provinces. Oldham, M.J; ONHIC, 487 recs.
13	Boyne, A.W. & Grecian, V.D. 1999. Tern Surveys. Canadian Wildlife Service, Sackville, unpublished data. 23 recs.
13	e-Butterfly. 2016. Export of Maritimes records and photos. Maxim Larrivee, Sambo Zhang (ed.) e-butterfly.org.
13	MacKinnon, D.S. 1998. Ponhook Lake survey map & notes. Dept of Environment and Labour, Protected Areas Branch, 13 recs.
13	Whittam, R.M. 1999. Status Report on the Roseate Tern (update) in Canada. Committee on the Status of Endangered Wildlife in Canada, 36 recs.
12	Blaney, C.S. 2000. Fieldwork 2000. Atlantic Canada Conservation Data Centre. Sackville NB, 1265 recs.
12	Parks Canada. 2010. Specimens in or near National Parks in Atlantic Canada. Canadian National Museum, 3925 recs.
11	Cameron, R.P. 2013. 2013 rare species field data. Nova Scotia Department of Environment, 71 recs.
11	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
10	Basquill, S.P. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre, Sackville NB, 69 recs.
10	Brunelle, P.-M. (compiler). 2010. ADIP/MDDS Odonata Database: NB, NS Update 1900-09. Atlantic Dragonfly Inventory Program (ADIP), 935 recs.
10	Craik, Shawn. 2019. Roseate tern breeding observations from 2017 - 2019. Université Saint-Anne, 10 records.
10	e-Butterfly. 2019. Export of Maritimes records and photos. McFarland, K. (ed.) e-butterfly.org.
10	Ferguson, D.C. 1954. The Lepidoptera of Nova Scotia. Part I, macrolepidoptera. Proceedings of the Nova Scotian Institute of Science, 23(3), 161-375.
10	Smith, T.W. 2009. <i>Eleocharis tuberculosa</i> records in Yarmouth, Shelburne Count. COSEWIC. Pers. comm. to D.M. Mazerolle, 10 recs.
9	Adams, J. & Herman, T.B. 1998. Thesis, Unpublished map of <i>C. insculpta</i> sightings. Acadia University, Wolfville NS, 88 recs.
9	Basquill, S.P., Porter, C. 2019. Bryophyte and lichen specimens submitted to the E.C. Smith Herbarium. NS Department of Lands and Forestry.
9	Benjamin, L.K. 2009. Boreal Felt Lichen, Mountain Avens, Orchid and other recent records. Nova Scotia Dept Natural Resources, 105 recs.
9	deGooyer, K. 2019. Snapping Turtle and Eastern White Cedar observations. Nova Scotia Environment.
9	MacKinnon, D.S. & Maass, O.C. 1996. Fieldwork 1996. Dept Natural Resources, Parks Division, 9 recs.
9	Neily, T.H. 2019. Tom Neily NS Bryophyte records (2009-2013). T.H. Neily, Atlantic Canada Conservation Data Centre, 1029 specimen records.
9	O'Grady, Sally. 2010. Piping Plover Nesting in Kejimikujik Seaside Annex, 2008-10. Parks Canada, 9 recs.
9	Patrick, Allison. 2021. Animal and plant records from NCC properties from 2019 and 2020. Nature Conservancy Canada.
9	Riley, J. 2020. Digby County lichen observations. Pers. comm. to J.L. Churchill.
8	Belliveau, A. 2013. email to Sean Blaney regarding <i>Listera australis</i> observations in SW Nova Scotia. Mersey Tobeatic Research Institute, 8.

# recs	CITATION
8	Neily, T.H. & Pepper, C.; Toms, B. 2018. Nova Scotia lichen database Update. Mersey Tobeatic Research Institute, 14 recs.
8	Neily, T.H. 2010. Erioderma Pedicellatum records 2005-09. Mersey Tobiatic Research Institute, 67 recs.
8	Newell, R.E. 2019. Crocanthemum canadense records compiled for provincial status report. pers. comm. from Ruth Newell to AC CDC.
8	NS DNR. 2017. Black Ash records from NS DNR Permanent Sample Plots (PSPs), 1965-2016. NS Dept of Natural Resources.
8	Pepper, C. 2021. Rare bird, plant and mammal observations in Nova Scotia, 2017-2021.
8	Wood, E.W. 2011. Sabatia kennedyana locations in Nova Scotia. Pers. comm. to C.S. Blaney. Gray Herbarium, Harvard University, 8 recs.
7	Bateman, M.C. 2001. Coastal Waterfowl Surveys Database, 1965-2001. Canadian Wildlife Service, Sackville, 667 recs.
7	Kennedy, B.; Cron, C. 2019. observations of Poison Sumac and Buttonbush, Nova Scotia. pers. commun to AC CDC.
7	Misc. rare species records gathered by NSDNR staff or communicated to NSDNR and forwarded to ACCDC
7	Pepper, C. 2013. 2013 rare bird and plant observations in Nova Scotia. , 181 records.
6	Benedict, B. Connell Herbarium Specimens (Data) . University New Brunswick, Fredericton. 2003.
6	Bredin, K.A. 2002. NS Freshwater Mussel Fieldwork. Atlantic Canada Conservation Data Centre, 30 recs.
6	Klymko, J.J.D. 2011. Insect fieldwork & submissions, 2010. Atlantic Canada Conservation Data Centre. Sackville NB, 742 recs.
6	McMullin, Troy. 2021. Anzia colpodes observations near Kejimikujik National Park. Canadian Museum of Nature.
5	Blaney, C.S. 1999. Fieldwork 1999. Atlantic Canada Conservation Data Centre. Sackville NB, 292 recs.
5	Christie, D.S. 2000. Christmas Bird Count Data, 1997-2000. Nature NB, 54 recs.
5	Layberry, R.A. 2012. Lepidopteran records for the Maritimes, 1974-2008. Layberry Collection, 1060 recs.
5	Lock, A.R., Brown, R.G.B. & Gerriets, S.H. 1994. Gazetteer of Marine Birds in Atlantic Canada. Canadian Wildlife Service, Atlantic Region, 137 pp.
5	Newell, R.E. 2002. A Botanical Survey of the Sand Pond National Wildlife Area. , 12 recs.
5	Rothrock, P. 2002. Carex longii in NS. Taylor University, Pers. com. to L. Benjamin, forwarded to S. Blaney. 5 recs.
5	Williams, M. Cape Breton University Digital Herbarium. Cape Breton University Digital Herbarium. 2013.
4	Belliveau, A.G. 2019. Maleberry (Lyonia ligustrina) count at Long Lake, Yarmouth Co., NS. E.C Smith Herbarium, Acadia University, Wolfville NS, 4 records.
4	Bradford, R. 2004. Coregonus huntsmani locations. Dept of Fisheries & Oceans, Atlantic Region, Pers. comm. to K. Bredin. 4 recs.
4	Cameron, R.P. 2009. Erioderma pedicellatum database, 1979-2008. Dept Environment & Labour, 103 recs.
4	Cameron, R.P. 2009. Nova Scotia nonvascular plant observations, 1995-2007. Nova Scotia Dept Natural Resources, 27 recs.
4	Edsall, J. 2007. Personal Butterfly Collection: specimens collected in the Canadian Maritimes, 1961-2007. J. Edsall, unpubl. report, 137 recs.
4	Ogden, J. NS DNR Butterfly Collection Dataset. Nova Scotia Department of Natural Resources. 2014.
4	Robinson, S.L. 2011. 2011 ND dune survey field data. Atlantic Canada Conservation Data Centre, 2715 recs.
4	Sollows, M.C., 2008. NBM Science Collections databases: mammals. New Brunswick Museum, Saint John NB, download Jan. 2008, 4983 recs.
4	Toms, B. 2015. Lophiola aurea (Goldencrest) records from Molega Lake. Mersey Tobeatic Research Institute, 4 records.
4	Toms, B. 2016. Email list of four GPS locations of Golden Crest (Lophiola aurea) from the previously documented site on Molega Lake, NS. Mersey Tobeatic Research Institute, 4 records.
3	Austin-Smith, P. 2014. 2014 Common Nighthawk personal communication report, NS. NS Department of Natural Resources.
3	Basquill, S.P. 2009. 2009 field observations. Nova Scotia Dept of Natural Resources.
3	Bayne, D.M. 2014. 2014 insect field observations.
3	Canadian Wildlife Service, Atlantic Region. 2010. Piping Plover censuses 2006-09. , 35 recs.
3	Clayden, S.R. 1998. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 19759 recs.
3	deGooyer, K. 2019. Eastern White Cedar observations, Norwood, Nova Scotia. Nova Scotia Environment.
3	Hill, N. 1995. Rare & Uncommon Plants of the Kejimikujik Seaside Adjunct. Biology Dept., Mount Saint Vincent University, 15 recs.
3	Holder, M.L.; Kingsley, A.L. 2000. Kingsley and Holder observations from 2000 field work.
3	Hope, P. 2002. Field survey of Goodyera pubescens population at Kejimikujik National Park. Kejimikujik National Park, 3 recs.
3	Klymko, J.J.D.; Robinson, S.L. 2012. 2012 field data. Atlantic Canada Conservation Data Centre, 447 recs.
3	McLean, K. 2019. Species At Risk observations. Clean Annapolis River Project.
3	McLean, K. 2020. Species occurrence records from Clean Annapolis River Project fieldwork in 2020. Clean Annapolis River Project, 206 records.
3	Mills, Pamela. 2008. Clethra alnifolia at Mudflat Lake. Nova Scotia Dept of Natural Resources, Wildlife Div. Pers. comm. to D.M. Mazerolle, 4 recs.
3	Ogden, K. Nova Scotia Museum butterfly specimen database. Nova Scotia Museum. 2017.
3	Olsen, Ervin. 2018. Nova Scotia Atlantic Coastal Plain Flora observations. Halifax Field Naturalists Nova Scotia Nature Archive Facebook Page.
3	Smith, T.W. 2009. Assessment and update status report on the Tubercled Spike-rush (Eleocharis tuberculosa) in Canada. Committee on the Status of Endangered Wildlife in Canada, 3 recs.
3	Sollows, M.C. 2008. NBM Science Collections databases: herpetiles. New Brunswick Museum, Saint John NB, download Jan. 2008, 8636 recs.
3	Staicer, C. 2013. Personal communication concerning Hirundo rustica nesting in and around Kejimikujik NP, NS. Pers. comm.
2	Anon. 2017. Export of Maritimes Butterfly records. Global Biodiversity Information Facility (GBIF).
2	Benedict, B. Connell Herbarium Specimens, Digital photos. University New Brunswick, Fredericton. 2005.
2	Benjamin, L.K. 2002. Rare plant observations by P. MacDonald, P. Mills, S. Eaton, H. MacKinnon, B. Colpitts at Sloans Lake, NS. Pers. comm. to L.K. Benjamin, NSDNR, with P. MacDonald, 3 recs.
2	Brunelle, P.-M. 2009. NS Power odonata records for Mersey, Tusket & Sissiboo systems. Nova Scotia Power, 218 recs.
2	Cameron, R.P. 2014. 2013-14 rare species field data. Nova Scotia Department of Environment, 35 recs.
2	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.
2	Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
2	e-Butterfly. 2018. Selected Maritimes butterfly records from 2016 and 2017. Maxim Larrivee, Sambo Zhang (ed.) e-butterfly.org.
2	Edge, Thomas A. 1984. Status report on the Atlantic Whitefish (Coregonus huntsmani). Committee on the Status of Endangered Wildlife in Canada.
2	Gilhen, J., Jones, A., McNeil, J., Tanner, A.W. 2012. A Significant Range Extension for the Eastern Ribbonsnake, Thamnophis sauritus, in Nova Scotia, Canada. The Canadian Field-Naturalist, 126(3): 231-233.

# recs	CITATION
2	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.
2	Kennedy, B. & Cron, C.; Patriquin, D. 2018. Email to Sean Blaney on observations of <i>Trichostema dichotomum</i> at Shingle Lake, Nova Scotia. , 2 records.
2	Klymko, J. Butterfly records at the Nova Scotia Museum not yet accessioned by the museum. Atlantic Canada Conservation Data Centre. 2017.
2	Klymko, J. Univeriste de Moncton insect collection butterfly record dataset. Atlantic Canada Conservation Data Centre. 2017.
2	Klymko, J.J.D. 2016. 2015 field data. Atlantic Canada Conservation Data Centre.
2	Majka, C.G. & McCorquodale, D.B. 2006. The Coccinellidae (Coleoptera) of the Maritime Provinces of Canada: new records, biogeographic notes, and conservation concerns. <i>Zootaxa</i> . <i>Zootaxa</i> , 1154: 49–68. 7 recs.
2	Manthorne, A. 2019. Incidental aerial insectivore observations. <i>Birds Canada</i> .
2	Mills, P. 2016. Email communication to S. Blaney, re: <i>Scirpus longii</i> at Upper Great Brook, Queens Co. NS. NS DNR, 2 recs.
2	Olsen, R. Herbarium Specimens. Nova Scotia Agricultural College, Truro. 2003.
2	Phinney, Lori; Toms, Brad; et. al. 2016. Bank Swallows (<i>Riparia riparia</i>) in Nova Scotia: inventory and assessment of colonies. Merser Tobeiatc Research Institute, 25 recs.
2	Porter, K. 2013. 2013 rare and non-rare vascular plant field data. St. Mary's University, 57 recs.
2	Wong, Sarah. 2021. Chimney Swift observations, Beverly Lake, NS. pers. comm.
1	Amiro, Peter G. 1998. Atlantic Salmon: Southern Nova Scotia SFA 21. Dept of Fisheries & Oceans, Atlantic Region, Science. Stock Status Report D3-11. 1 rec.
1	Arsenault, R. 2009. <i>Goodyera pubescens</i> record in Kejimikujik National Park. Pers. comm. to C.S. Blaney, 1 rec.
1	Basquill, S.P. 2011. Field observations & specimen collections, 2010. Nova Scotia Department of Natural Resources, Pers. comm. , 8 Recs.
1	Belliveau, A. & Toms, B. 2012. Email regarding <i>Lophiola aurea</i> (Goldencrest) location on Molega Lake, NS. Mersey Tobeatic Research Institute, 3 records.
1	Bernard, Laurel. 2013. Email to Sean Blaney regarding <i>Listera australis</i> at Lake Rossignol. Nature Conservancy of Canada, 1.
1	Breen, A. 2017. 2017 Atlantic Whitefish observation. Coastal Action.
1	Butt, Brad. 2020. Email from Brad Butt to Sean Blaney regarding a Blue Felt Lichen (<i>Pectenia plumbea</i>) from near Deception Lake, Shelburne Co., NS. pers. comm., 1 record.
1	Cameron, R.P. 2008. <i>Erioderma pedicellatum</i> N of Jones Harbour. Nova Scotia Environment & Labour. Pers. comm. to D.M. Mazerolle, 1 rec.
1	Chapman, Cody. Unreported Species at Risk Records across Nova Scotia. Chapman, Cody, 5 records.
1	Chaput, G. 2002. Atlantic Salmon: Maritime Provinces Overview for 2001. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-14. 39 recs.
1	Churchill, J.L. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre, 2318 recs.
1	Clayden, S.R. 2020. Email to Sean Blaney regarding <i>Pilophorus cereus</i> and <i>P. fibula</i> at Fidele Lake area, Charlotte County, NB. pers. comm., 2 records.
1	Crowell, M.J. 2009. <i>Lilaeopsis chinensis</i> on Roseway River. Jacques Whitford Limited. Pers. comm. to D.M. Mazerolle, 1 rec.
1	deGooyer, K. 2018. <i>Chelydra serpentina</i> observation record. Nova Scotia Environment.
1	deGooyer, K. 2020. Eastern White Cedar observations, Norwood, Nova Scotia. Nova Scotia Environment.
1	Dibble, A. 1992. Rare plant field form for <i>Amelanchier nantucketensis</i> on McLean Is., Shelburne Co., NS in 1992. University of Maine, Orono, 2 pp.
1	Fernald, M.L. 1921. Expedition to Nova Scotia. <i>Rhodora</i> 13: 136-273.
1	Hall, Duane. 2018. <i>Martes americana</i> record by Duane Sabine, emailed to J. Klymko on 13 12 2018. pers. comm.
1	Hill, N.M. 2013. email communications to Sean Blaney and David Mazerolle regarding the discovery of <i>Listera australis</i> populations at Black River Lake and Middlewood. , 2.
1	Hill, N.M. 2016. Email communications to Sean Blaney and Alain Belliveau regarding the discovery of <i>Fimbristylis autumnalis</i> on the shores of Loon Lake, Kejimikujik National Park. Pers. comm., 1 rec.
1	Hope, P. 2007. Water-pennywort (<i>Hydrocotyle umbellata</i>) on Ell Island. Parks Canada, Kejimikujik NP, 1 record.
1	Johnstone, D.; Churchill J. 2014. 2014 Chimney Swift observation, Kejimikujik NP, NS. Atlantic Canada Conservation Data Centre.
1	Jotcham, J. 2013. email to Sean Blaney regarding the discovery of a <i>Listera australis</i> population at Port Mouton. , 1.
1	Kennedy, B. 2019. observations of <i>Crocianthemum canadense</i> at Bangs Falls, Nova Scotia. iNaturalist.ca.
1	Klymko, J.J.D. 2016. 2014 field data. Atlantic Canada Conservation Data Centre.
1	MacKinnon, D.S. 2002. Fieldwork 2002. Dept of Environment & Labour, Protected Areas Branch, 1 rec.
1	MacKinnon, D.S. 2012. <i>Goodyera pubescens</i> observation, photo. Pers. comm. to S. Blaney, Sep 18, 1 rec.
1	McAlpine, D.F. 1998. NBM Science Collections databases to 1998. New Brunswick Museum, Saint John NB, 241 recs.
1	McMahon, R. 2019. Mainland Moose observation. Pers. comm. to A. Belliveau.
1	McNeil, J.A. 2018. Wood Turtle records, 2018. Mersey Tobeatic Research Institute, 68 recs.
1	NatureServe Canada. 2018. iNaturalist Butterfly Data Export . iNaturalist.org and iNaturalist.ca.
1	Neily, P.D. Plant Specimens. Nova Scotia Dept Natural Resources, Truro. 2006.
1	Neily, T.N. 2021. Hectanooga Bryophytes. pers. comm., 1 record.
1	Parker, G.R., Maxwell, J.W., Morton, L.D. & Smith, G.E.J. 1983. The ecology of Lynx , <i>Lynx canadensis</i> , on Cape Breton Island. <i>Canadian Journal of Zoology</i> , 61:770-786. 51 recs.
1	Scott, F.W. 1988. Status Report on the Southern Flying Squirrel (<i>Glaucomys volans</i>) in Canada. Committee on the Status of Endangered Wildlife in Canada, 2 recs.
1	Shortt, R. UNB specimen data for various tracked species formerly considered secure. Connell Memorial Herbarium, UNB, Fredericton NB. 2019.
1	Smith, M. 2016. Email regarding additional location of <i>Fimbristylis autumnalis</i> on shores of Loon Lake, Kejimikujik National Park. pers. comm., 1 record.
1	Sollows, M.C.. 2009. NBM Science Collections databases: Coccinellid & Cerambycid Beetles. New Brunswick Museum, Saint John NB, download Feb. 2009, 569 recs.
1	Stewart, P. 2013. email to Sean Blaney regarding the discovery of a <i>Listera australis</i> population at Blockhouse. Envirosphere Consultants Limited, 1.
1	Toms, Brad. 2009. New <i>Scirpus longii</i> record on Lake Rossignol. Mersey Tobeatic Research Institute.
1	Weatherby, C.A. 1942. Two weeks in southwestern Nova Scotia. <i>Rhodora</i> , 44: 229-236.
1	Wong, Sarah. 2020. Two Chimney Swift observation made by Sarah Wong. pers. comm. to Sean Blaney.

APPENDIX E

NOVA SCOTIA MUSEUM REPORT

HERITAGE AND BIOLOGICAL RESOURCES

Date: April 26th, 2022

To: Hayley Doyle, Envirosphere Consultants Limited

From: Coordinator Special Places, Culture and Heritage Development

Subject: Granite Village Quarry

Staff of the Department of Communities, Culture, Tourism, and Heritage has reviewed the Granite Village Quarry Project mapping and have provided the following comments:

Archaeology

CCTH Staff have completed their reviews of the ES 2022-03-29b - Envirosphere, Granite Village. Given the numerous indigenous archaeology sites recorded in the wider vicinity, as well as the proximity of the development to significant hydrological features, it is recommended that an ARIA take place. The ARIA should include a thorough desktop study, an exercise in predictive modelling, and field reconnaissance. Exploratory shovel testing may be a possibility however, the decision to shovel test will depend on what the archaeology consultant observes in the field.

Botany

Staff reviewed the sections of the EA document pertaining to botany.

Environmental Screening – Granite Village Quarry (N 43.87987, W -64.973032)

Granite Village Quarry

- There are no specimens of rare or at-risk species in the NSM database with this location name
- There is a predicted boreal felt lichen (*Erioderma pedicellatum*) habitat polygon (as per Cameron et al. 2008) to the north of the existing quarry – potential expansions in this area should be surveyed by a qualified lichen surveyor.

Table 1: Species records from the Atlas of Rare Plants of Nova Scotia

Latin name	S-rank	Provincial
<i>Alnus serrulata</i>	S3	yellow

<i>Goodyera repens ophioides</i>	S3S4	Yellow
<i>Teucrium canadense</i>	S4	Yellow

Table 2: Species records according to iNaturalist observations, within 5 km of the study area

Latin name	S-rank	Provincial	COSEWIC	SARA
<i>Pectenium plumbeum</i>	S3	vulnerable	special concern	special concern
<i>Epigaea repens</i>	S5			
<i>Gaylussacia baccata</i>	S5			
<i>Ilex verticillata</i>	S5			
<i>Schoenoplectus acutus</i>	S4			
<i>Viburnum nudum cassinoides</i>	S5			

Literature Cited:

Cameron, R. P. & T. Neily, 2008. Heuristic model for identifying the habitats of *Erioderma pedicellatum* and other rare cyanolichens in Nova Scotia, Canada. *The Bryologist*, 111: 650–658.

Palaeontology

The bedrock geology in this area is the Late Devonian monzogranite, so no fossil resources are of concern in this area.

Zoology

No CCH staff were available to review the sections relating to zoology.

APPENDIX F

LABORATORY RESULTS

TSS & pH

Envirosphere Consultants Limited

Unit 5—120 Morison Drive, Box 2906, Windsor, Nova Scotia, B0N 2T0

ph: (902) 798-4022, fax: (902) 798-2614, e-mail: enviroco@ns.sympatico.ca, website: www.envirosphere.ca

Environmental Sample Analysis Report

Report Date: 20-Jun-22 Report Number: A0898

Envirosphere Consultants Ltd
Unit 5 - 120 Morison Drive
Windsor, NS | B0N 2T0

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	TSS (mg/L)	Type of Sample	Detection Limit	Sample Comments
L2022-37	Vernal Pool #1	Granite Village Quarry	Surface Water	02/06/2022	02/06/2022	1.0	REG	0.5 mg/L	
L2022-37	West Pond #1	Granite Village Quarry	Surface Water	02/06/2022	02/06/2022	18.0	REG	0.5 mg/L	
L2022-37	East Pond #1	Granite Village Quarry	Surface Water	02/06/2022	02/06/2022	5.0	REG	0.5 mg/L	
L2022-37	Power Line Culvert	Granite Village Quarry	Surface Water	02/06/2022	02/06/2022	0.5	REG	0.5 mg/L	
L2022-37	Power Line Culvert (dup)	Granite Village Quarry	Surface Water	02/06/2022	02/06/2022	<0.5	DUP	0.5 mg/L	
L2022-37	Blank	Granite Village Quarry	Blank	02/06/2022	02/06/2022	<0.5	BLANK	0.5 mg/L	
L2022-37	CRM	Granite Village Quarry	CRM	02/06/2022	02/06/2022	199.5	STD	0.5 mg/L	CRM 209 mg/L

Name of Analyst: H. Leung for S. Nezak Analyses reviewed by: [Signature] Director / Lab Manager (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2017, "General Requirements for the Competence of Testing and Calibration Laboratories".

Validation Range: 1-1000 mg/L The results in this report relate only to the items tested. More information is available upon request.

The quality of the results is dependent on the quality of sample provided.

Samples for TSS analysis should be kept cool until delivery to the lab unless they are analyzed immediately. A minimum sample volume of 500 ml is preferred. Place sample in a clean plastic container free of cracks or contamination. Fill the bottle to the top and then cap. Samples should reach the lab within 24 hours of sampling, but will be accepted up to 7 days.

Methods: Modified from Standard Methods for the Examination of Water and Wastewater 23rd Edition, 2017 and online version, 2540D. Total Suspended Solids. ECL method 3, Total Suspended Solids.

Type of Sample: REG = regular; STD = standard; DUP = duplicate; CRM = certified reference material.

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.

Envirosphere Consultants Limited

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Envirosphere Consultants
unit 5 - 120 Morison Drive
Windsor, NS | B0N 2T0

Environmental Sample Analysis Report

Report Date: 20-Jun-22 Report Number: A0897

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	pH	Type of Sample	Detection Limit	Sample Comments
L2022-37	Vernal Pool #1	Granite Village Quarry	Surface Water	02/06/2022	02/06/2022	4.8	REG	0.1	
L2022-37	West Pond #1	Granite Village Quarry	Surface Water	02/06/2022	02/06/2022	6.0	REG	0.1	
L2022-37	East Pond #1	Granite Village Quarry	Surface Water	02/06/2022	02/06/2022	6.0	REG	0.1	
L2022-37	Power Line Culvert	Granite Village Quarry	Surface Water	02/06/2022	02/06/2022	5.1	REG	0.1	
L2022-37	Power Line Culvert (dup)	Granite Village Quarry	Surface Water	02/06/2022	02/06/2022	5.1	DUP	0.1	
L2022-37	CRM	Granite Village Quarry	CRM	02/06/2022	02/06/2022	7.0	STD	0.1	CRM pH 7.00

Name of Analyst: A. Leung for S. Nazari Analyses reviewed by: HL Director Lab Manager (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2017, "General Requirements for the Competence of Testing and Calibration Laboratories".

Validation Range: 3-10 units The results in this report relate only to the items tested. More information is available upon request.

The quality of the results is dependent on the quality of sample provided.

Comment: Samples for pH should be kept cool until delivery to the lab unless the samples are analyzed immediately. Preferably samples should be analyzed within 24 hours. Hach manual recommends filling bottle completely and capping tightly; cooling to 4°C for storage and analyzing within 6 hours. If this can't be done, Hach manual recommends reporting the holding time with results.

Method: Standard Methods for the Examination of Water and Wastewater 23rd Edition, 2017 and online version., 4500-HB. Electrometric measurement of pH. ECL Method 8, pH.

Type of Sample: REG = regular; STD = standard; DUP = duplicate; CRM = certified reference material.

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.