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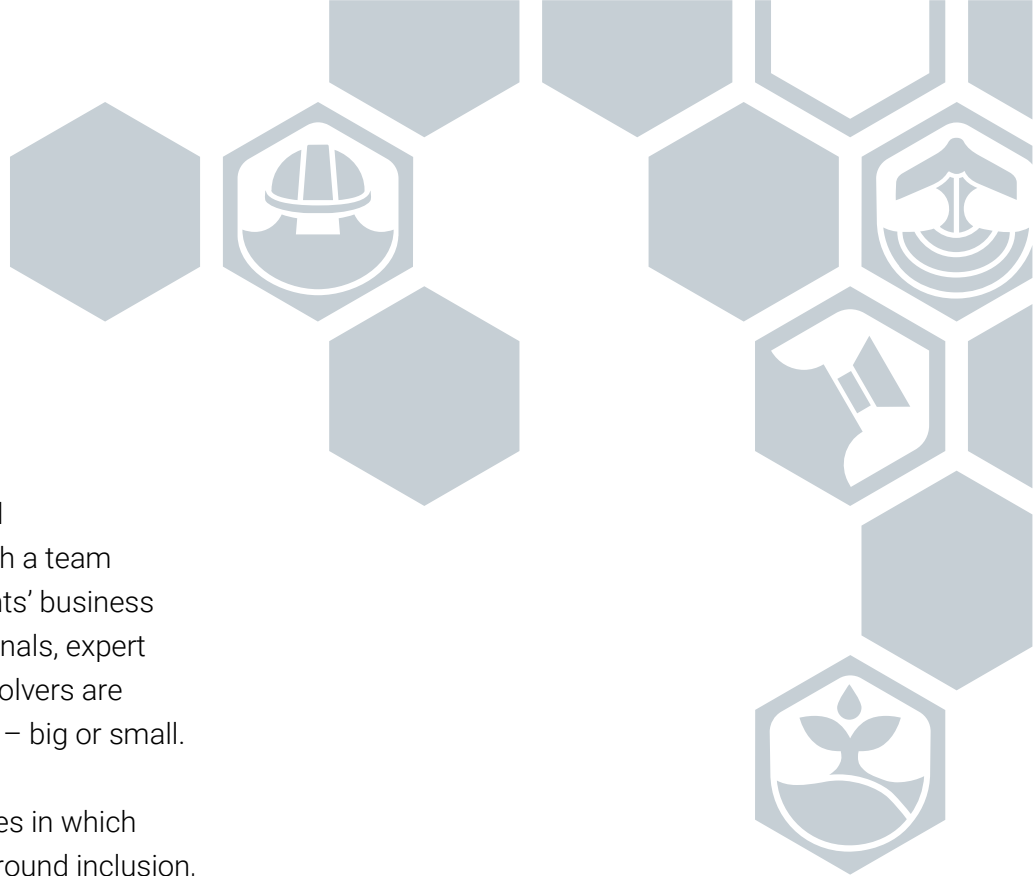
Raptors, Rare Plants, and Rare Lichen Surveys

REF # 224-001

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SEM Ltd. is a NL-based, Inuit owned multidisciplinary consulting firm with a team of specialists ready to take our clients' business to the next level. Our agile professionals, expert innovators and educated problem solvers are always ready to take on any project – big or small.

We are dedicated to the communities in which we work, and our culture revolves around inclusion, engagement, and achieving our goals for clients and their communities.

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1.0 Introduction

Sikumiut Environmental Management Ltd. (SEM) was contracted by Gosse Developments ('the Proponent') in the summer/fall of 2022 to complete raptor surveys, rare plant surveys, and rare lichen surveys on a parcel of land in Whitbourne, NL. This Project, titled Whitbourne (Junction Pond) Residential Development (Registration No. 1414) was released from Environmental Assessment in 2009 with conditions, including these three surveys. The following report outlines the results of these surveys.

The Assessment Area is in the Town of Whitbourne, NL, and consists of ~80 hectares of land. The site can be accessed from the north via Sunset Boulevard, off Main Road. The land is bound to the west by Junction Pond, to the south by Second Pond, to the east by Hooper's Pond, and to the northeast by Bethune Pond (Figure 1).

The Assessment Area is located slightly west of the Avalon Forest Ecoregion and technically lies within the Maritime Barrens Ecoregion; however, it is more representative of the Avalon Forest Ecoregion, an anomalous sheltered region, dominated by mature balsam fir (*Abies balsamea*), white birch (*Betula papyrifera*), and yellow birch (*Betula alleghaniensis*) (the rest of the Avalon is often exposed and windswept). The Assessment Area is comprised of a mosaic of habitat types, including bog, treed bog, treed swamp, mature balsam fir, mature upland yellow and white birch, and balsam fir thicket. In addition, the ponds provide aquatic habitats, including riparian zones along the inflows and outflow streams.

The warm, moist conditions of this area provide potential habitats for several rare plant and lichen species, including wetland species or wetland-associated species. Several species potentially occurring within the boundaries of the Assessment Area are protected by federal and/or Provincial legislation, including species listed under the *Species at Risk Act* (SARA) and/or the *NL Endangered Species Act* (NL ESA). Potential Species at Risk (SAR) known to occur in relative proximity to the Assessment Area include Boreal Felt Lichen (*Erioderma pedicellatum*), Blue Felt Lichen (*Pectenia plumbea*), Red Crossbill (*Loxia curvirostra percna*), Evening Grosbeak (*Coccothraustes vespertinus*), Short-eared Owl (*Asio flammeus*), Rusty Blackbird (*Euphagus carolinus*), and Olive-sided Flycatcher (*Contopus cooperi*). In addition, consultations with NL Wildlife Division (NLWD) informed SEM of the potential for several rare (but not listed) species, including Small Waterwort (*Elatine minima*), Golden Hedge Hyssop (*Gratiola aurea*), Acadian Quillwort (*Isoetes acadensis*), Little Floating Heart (*Nymphoides cordata*), Large-leaved Bog Orchid (*Platanthera macrophylla*), Eastern Purple Bladderwort (*Utricularia purpurea*), and Long-leaved Stitchwort (*Stellaria longifolia*).

To comply with the release conditions from Environmental Assessment (EA), a comprehensive field program was conducted according to NLWD requirements to determine the presence of: (1) nesting raptors within the Assessment Area; (2) rare plants in the area, including SAR or species of conservation concern; and (3) rare lichens in the Assessment Area.



Figure 1 The Assessment Area surveyed for raptors, rare plants, and rare lichens.

2.0 Study Team

SEM utilized an experienced team of biologists to administer all aspects of the Project. The roles and responsibilities of key team members are outlined below.

Steve Gullage (MSc., BScF.) Senior Biologist

Role: Project Manager, Field Lead

Responsibilities: Overall project management and administration, field work planning and logistics, supervision of field team members, conducting boreal felt lichen surveys, analyzing UAV imagery for potential raptor nests, conducting raptor nest surveys on the ground, report preparation.

Summary of Qualifications: Steve has supervised a broad array of monitoring and research projects over a career of 22 years. Steve has had management roles in large projects like the White Lake Biophysical Assessment at IOC, the multi-million-dollar field program for the Newfoundland Caribou Strategy, the Maritimes Breeding Bird Atlas, Conservation Visions' Wild Harvest Initiative, and the Ontario Wildlife Assessment Program. Since joining SEM in 2018, Steve has supervised projects on Boreal Felt Lichen for NL Hydro, Terrestrial Effects Monitoring at Come by Chance, and several Biophysical Assessment projects at IOC. Steve has always purposefully diversified his background across several ecological areas of study, with extensive experience in surveying birds by sight and sound, collaring and telemetry of black bears, caribou, lynx, and coyote, conducting telemetry on hummingbirds, surveying endangered lichens, monitoring wolves, and surveying Species at Risk like Harlequin Duck and Short-eared Owl. Steve specializes in everything terrestrial: wetland and forest surveys, bird and mammal surveys, animal telemetry, plant surveys, lichen surveys, and habitat classification. Steve has extensive experience delineating wetlands in Newfoundland and Labrador and has conducted WESP-AC functional assessments and completed the WESP-AC course by the Maritime College of Forest Technology.

Derrick Mitchell (BSc.) Terrestrial Ecologist, Principal, Boreal Environmental

Role: Rare Plant Surveys

Responsibilities: Prior to field surveys Derrick analyzed imagery to determine potential habitats for rare flora that could exist in the Project Area. Derrick conducted all of the rare plant surveys in the Project Area.

Summary of Qualifications: Derrick is a well-established terrestrial ecologist, a registered professional forester, and a botany specialist. With over 15 years of experience working in the environmental industry, his expertise also includes environmental permitting, habitat mapping, remote sensing, environmental

compliance, ecological restoration, natural resource management, and Geographic Information Systems (GIS).

Derrick is recognized as one of the leading wetland delineators in Atlantic Canada. He is a certified wetland delineator with 13 years of experience in wetland delineation, is Vice-Chair of the Wetland Delineators Association in New Brunswick and is a Registered Wetland Professional in Nova Scotia. He received formal wetland delineation training in 2006 at the Humboldt Field Research Institute in Stueben, Maine as well as formal training in WESP-AC. Derrick has conducted innumerable WESP-AC functional assessments over his lengthy career as a wetland professional and has trained several other professionals in the application of WESP-AC protocol.

3.0 Methods

Each targeted component (i.e., raptors, rare plants, and lichens) warranted its own survey due to the required timing for each; however, opportunistic information-gathering for each was conducted concurrently while surveying. The sections below summarize the methods employed for each of the surveys and the mapping preparation for each.

3.1 Geographic Information Systems Methods

To facilitate the planning of field efforts, SEM obtained the Assessment Area boundaries from the Proponent. First SEM developed a map of transects for the UAV survey for raptors (methods discussed separately below). Secondly, a map was created to focus field surveys for the rare plant component. Given the list provided by NLWD, the only high-potential areas for rare plants included areas of aquatic habitats and wetlands. In addition, a map was created outlining all the wetlands to guide surveys for Boreal Felt Lichen, and of the potential upland deciduous forest to guide surveys for Blue Felt Lichen.

3.2 Raptor Survey Methods

To survey for large raptor nests in the Assessment Area, SEM employed an aerial transect survey on July 15, 2022, using a rotary UAV equipped with an HD Camera. Nest site fidelity across years is common for many raptor species and nests of large raptors can be identified from the resulting high-definition photographs and/or video. This type of aerial survey mostly targets larger raptors with large treetop (or near treetop) nests like Osprey (*Pandion haliaetus*) and Bald Eagle (*Haliaeetus leucocephalus*). The purpose of deploying a Remotely Piloted Aircraft System (RPAS/drone) to survey raptor nests as an alternative to the traditional helicopter survey is to minimize disturbance to birds. RPAS represent an effective and adaptable tool for safely surveying raptor nests and provide a permanent record of the survey. Researchers have clearly demonstrated that RPAS cause less disturbance than helicopters or planes. Ornithologist David Bird concluded that *“The reduction of safety risks and obtrusiveness associated with using manned aircraft, bucket trucks, or climbing to nests to count eggs or young illustrates the benefits and suitability of these machines (i.e., RPAS) to survey nests. To maximize success, it is critical that proper flight technique, taking into account bird and human safety, is adopted, practiced, and executed.”*

Twenty-three (23) parallel transects were flown at an altitude of ~100 m above ground level and 65 m apart to cover the majority of the Assessment Area (the remainder, on the eastern peninsulas, was covered on foot during August and September and sought observations of treetop nests and other observations of any raptor species). Surveys were flown at a speed to facilitate robust observation of all the treetops and

structures in the area. The resulting imagery was thoroughly investigated for areas of interest (i.e., large stick nests atop trees, etc.).

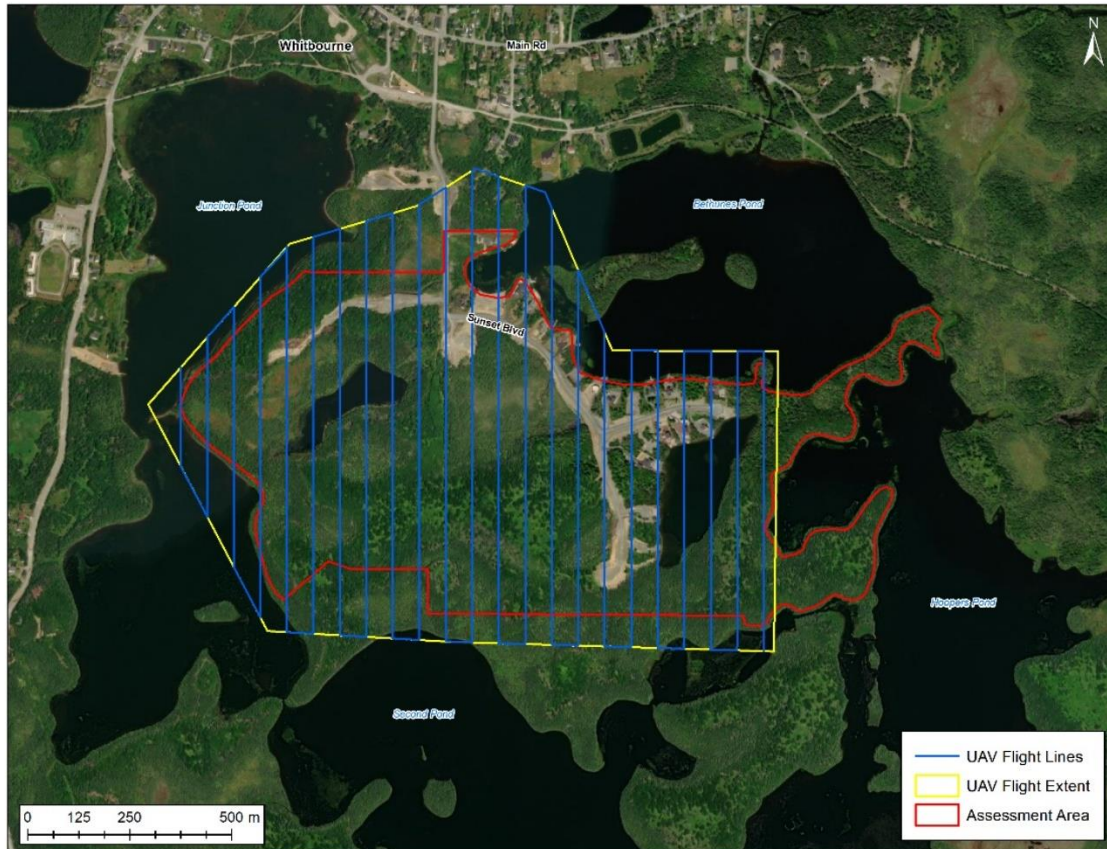


Figure 2 UAV flight lines for the aerial survey component of the raptor survey. The eastern peninsulas of the Assessment Area (outside of the flight paths were surveyed from the ground).

In addition to the UAV component of the raptor survey, SEM biologists conducted field surveys (while conducting rare plant and rare lichen surveys) and sought observations of those species with smaller nests, and those that do not nest on treetops (e.g., Northern Goshawk, Merlin, American Kestrel, Great-horned Owl). Surveys were conducted with high-quality optical equipment, and in addition to forest and shoreline surveys, scans of the sky were conducted at regular intervals. For both the RPAS survey and the ground survey, data were recorded on field data sheets and entered into Excel at the end of each field day.

3.3 Rare Plant Survey Methods

The goal of the rare plant study was to determine the occurrence of any rare plant species in the Assessment Area, including any species listed under the *NL ESA* or those identified by NLWD in a list provided to SEM.

The scope of work carried out for the vegetation and rare flora survey also included:

- A desktop analysis of habitat types within the Assessment Area;
- Identification of all encountered vascular vegetation within high potential habitats in the Assessment Area; and
- Identification of all encountered rare flora within the Project area.

There are 26 vascular plant species listed under the *NL ESA* known to occur in Newfoundland and Labrador. The number of plants ranked as regionally rare and/or uncommon is constantly being modified due to a lack of survey effort in much of NL. SEM's botanist used the list from NLWD to focus on specific habitat types during the surveys. SEM produced a list of the species observed and their rarity ranking based on the S-ranking system of the Atlantic Canada Conservation Data Centre (ACDC). SEM covered all areas of moderate to high potential for rare plants with 100% coverage.

The rare vascular plant survey was conducted within the Project Area over two days, one in August and one in early September to ensure a significant temporal window to observe flowering plants, etc. A targeted approach was undertaken to increase efficiency and ensure sufficient stratification by habitat type. Habitats were traversed with transects, and surveys focused on unique habitats such as riparian zones/watercourses and wetlands, which typically have elevated potential for the occurrence of rare species in NL. Locations of rare plants and locations of interest were recorded using a handheld GPS. The number of individuals of each rare species was estimated at each confirmed site. Specimens were collected if a species could not be identified in the field and were subsequently identified in the laboratory using various botanical keys, a hand lens, and online resources.



Figure 3 The survey track followed for the rare plant survey, targeting wetlands and waterbodies and sites of interest.

3.4 Rare Lichen Methods

Areas of medium to high potential for Boreal Felt Lichen, Graceful Felt Lichen, and Blue Felt Lichen were identified during rare plant surveys. These areas consisted primarily of mature balsam fir (for Boreal Felt Lichen) and mature yellow birch (for Blue Felt Lichen) and were in relative proximity to wetland. Boreal Felt Lichen is an epiphytic species which grows on the trunks and branches of coniferous trees (usually balsam fir). Blue Felt Lichen is also an epiphytic lichen found on the branches and trunks of trees but tends to prefer deciduous species such as yellow birch. Graceful Felt Lichen is found in similar habitat to Boreal Felt Lichen and on similar phorophytes.

The survey consisted of experienced biologists with a familiarity with these rare species conducting active searches for lichen species in suitable habitats within the Assessment Area (Figure 4). Each tree (trunk and branches) was examined on all sides from base to approximately 4 meters (as high as could be visually assessed by surveyors from the ground). Balsam fir trees received higher effort than other species for Boreal Felt Lichen. Similarly, yellow birch received greater focus than other tree species for Blue Felt Lichen.



Figure 4 Survey tracks followed for the rare lichen survey. Note that a second observer was offset by 25-50 m during these surveys (but did not record a second track).

Data to be recorded for each rare lichen included:

- GPS location (Easting and Northing);
- tree species;
- tree diameter (DBH);
- location of lichen on tree (e.g., height above ground, side of tree, branch vs. trunk);
- habitat description;
- photographs;
- lichen species; and
- location flagged using pink flagging tape in the field.

4.0 Results

4.1 Raptor Surveys

Raptors were surveyed with two methodologies: a RPAS survey to search for large stick nests like those of Osprey and Bald Eagle; and a secondary follow-up survey to establish the presence of other raptors (e.g., Sharp-shinned Hawk, Merlin, Northern Goshawk, etc.) based on visual and auditory detections.

An experienced SEM RPAS pilot conducted flights along transect lines (spaced at 150 m apart) to identify any large raptor nests within the Study Area. These high-quality images were then analyzed by SEM biologists to seek nests within the boundaries of the Assessment Area. 100% of the observable ground cover from above was recorded and analyzed. This included all the mature tree cover or any other elevated points that raptors would prefer to nest. After analyzing these images and footage, no raptor nests were located in the study area.

Surveys of the Assessment Area for other raptors were conducted during the rare plant and rare lichen surveys. One Great-horned Owl and one Merlin were observed; one by visual identification and one by sound, respectively. They were each detected in the yellow/white birch stands on top of the main ridge in the centre of the Assessment Area. However, there was no sign of a Great-horned Owl nest in the area the bird was observed, and the Merlin observation was a call associated with a flyover (i.e., the bird may not have been using the area in which it was observed).

Short-eared Owl, listed as Vulnerable by the Province, and Special Concern under SARA, has been recorded in the region, historically. This species is typically associated with grasslands, heathlands, meadows, tundra, marshes, dunes, and agricultural areas. None of these habitat types are present to any noticeable spatial extent in the Project Area, so it is quite unlikely this SAR is using the Project Area. However, during surveys on the ground, this species was one of the myriad species sought, and no individuals were observed of this SAR.

4.2 Rare Plant Surveys

During the flora surveys on the study area, SEM's botanist targeted areas and habitats of high potential (e.g., wetlands) and observed the following 122 species (Table 1).

Table 1 **Vegetation species observed within the boundaries of the Assessment Areas during 2022 surveys.**

Scientific Name	Common Name	S-Rank
<i>Abies balsamea</i>	Balsam Fir	S5
<i>Acer spicatum</i>	Mountain Maple	S5
<i>Agrostis scabra</i>	Rough Bentgrass	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Anaphalis margaritacea</i>	Pearly Everlasting	S5
<i>Aronia melanocarpa</i>	Black Chokeberry	S2S4
<i>Betula alleghaniensis</i>	Yellow Birch	S3
<i>Betula cordifolia</i>	Heartleaf Birch, mountain white birch	S4S5
<i>Bidens frondosa</i>	Devil's Beggar-Ticks	SU
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	S5
<i>Callitriche palustris</i>	Vernal Water Starwort	S4S5
<i>Cardamine pensylvanica</i>	Pennsylvania Bitter-Cress	S4
<i>Carex canescens</i>	Hoary Sedge	S5
<i>Carex echinata</i>	Little Prickly Sedge	S5
<i>Carex gynandra</i>	Nodding Sedge	S4
<i>Carex lasiocarpa</i>	Slender Sedge	S5
<i>Carex magellanica</i>	Boreal Bog Sedge	S5
<i>Carex pauciflora</i>	Few-Flowered Sedge	S4S5
<i>Carex scoparia</i>	Pointed Broom Sedge	S3
<i>Carex stipata</i>	Stalk-Grain Sedge	S4S5
<i>Carex trisperma</i>	Three-Seed Sedge	S5
<i>Carex utriculata</i>	Bear Sedge	S4S5
<i>Chamaedaphne calyculata</i>	Leatherleaf	S5
<i>Chelone glabra</i>	White Turtlehead	S4
<i>Circaea alpina</i>	Small Enchanter's Nightshade	S5
<i>Clintonia borealis</i>	Clinton Lily	S5
<i>Cornus canadensis</i>	Dwarf Dogwood	S5
<i>Cornus stolonifera</i>	Red-osier dogwood	S5
<i>Danthonia spicata</i>	Poverty Oat-Grass	S5
<i>Deschampsia cespitosa</i>	Tufted Hairgrass	S3S5
<i>Dryopteris campyloptera</i>	Mountain Wood-Fern	S5
<i>Dryopteris expansa</i>	Spreading Woodfern	S3S4
<i>Dryopteris intermedia</i>	Glandular Wood Fern	S5
<i>Eleocharis acicularis</i>	Least Spike-Rush	S3S4
<i>Eleocharis palustris</i>	Creeping Spike-Rush	S4S5
<i>Empetrum nigrum</i>	Black Crowberry	S5
<i>Epilobium ciliatum</i>	Hairy Willow-Herb	S5
<i>Equisetum sylvaticum</i>	Woodland Horsetail	S5
<i>Eriophorum virginicum</i>	Tawny Cotton-Grass	S4S5
<i>Euthamia graminifolia</i>	Flat-Top Fragrant-Golden-Rod	S5
<i>Fragaria virginiana</i>	Virginia Strawberry	S5
<i>Galium palustre</i>	Marsh Bedstraw	S4S5

<i>Galium triflorum</i>	Sweet-Scent Bedstraw	S5
<i>Gaultheria hispidula</i>	Creeping Snowberry	S5
<i>Geum rivale</i>	Purple Avens	S4S5
<i>Glyceria canadensis</i>	Canada Manna-Grass	S5
<i>Gnaphalium uliginosum</i>	Low Cudweed	SNA
<i>Gymnocarpium dryopteris</i>	Northern Oak Fern	S5
<i>Ilex mucronata</i>	Mountain Holly	S5
<i>Iris versicolor</i>	Blueflag	S5
<i>Juncus articulatus</i>	Jointed Rush	S5
<i>Juncus brevicaudatus</i>	Narrow-Paniced Rush	S5
<i>Juncus bufonius</i>	Toad Rush	S5
<i>Juncus effusus</i>	Soft Rush	S5
<i>Juncus tenuis</i>	Slender Rush	S4
<i>Kalmia angustifolia</i>	Sheep-Laurel	S5
<i>Kalmia polifolia</i>	Pale Laurel	S5
<i>Larix laricina</i>	American Larch	S5
<i>Linnaea borealis</i>	Twinflower	S5
<i>Lobelia dortmanna</i>	Water Lobelia	S5
<i>Lysimachia terrestris</i>	Swamp Loosestrife	S5
<i>Maianthemum canadense</i>	Wild Lily-of-The-Valley	S5
<i>Maianthemum trifolium</i>	Three-Leaf Solomon's-Plume	S5
<i>Mentha canadensis</i>	Canada Mint	S5
<i>Monotropa uniflora</i>	Indian-Pipe	S5
<i>Myosotis laxa</i>	Small Forget-Me-Not	S4
<i>Myrica gale</i>	Sweetgale	S5
<i>Myriophyllum spp.</i>	A species of Water Milfoil	
<i>Nuphar variegata</i>	Yellow Cowlily	S5
<i>Oclemena nemoralis</i>	Bog Aster	S5
<i>Orthilia secunda</i>	One-Side Wintergreen	S5
<i>Osmundastrum cinnamomeum</i>	Cinnamon Fern	S5
<i>Osoetes lacustris</i>	Lake Quillwort	S3
<i>Persicaria hydropiper</i>	Common Smartweed, Waterpepper	SNA
<i>Persicaria sagittata</i>	Arrowleaf tearthumb, arrow-vine	SNA
<i>Phalaris arundinacea</i>	Reed Canary Grass	SNA
<i>Picea glauca</i>	White Spruce	S5
<i>Picea mariana</i>	Black Spruce	S5
<i>Plantago major</i>	Nipple-Seed Plantain	SNA
<i>Potamogeton epihydrus</i>	Nuttall Pondweed	S4S5
<i>Prunus pensylvanica</i>	Fire Cherry	S4S5
<i>Ranunculus acris</i>	Tall Buttercup	SNA
<i>Ranunculus flammula</i>	Lesser Spearwort	S5
<i>Ranunculus repens</i>	Creeping Buttercup	SNA
<i>Rhododendron canadense</i>	Rhodora	S5
<i>Rhynchospora alba</i>	White Beakrush	S4S5
<i>Ribes glandulosum</i>	Skunk Currant	S5
<i>Rosa nitida</i>	Shining Rose	S4S5

<i>Rubus chamaemorus</i>	Cloudberry	S5
<i>Rubus hispidus</i>	Bristly Dewberry	SH
<i>Rubus idaeus</i>	Red Raspberry	S5
<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5
<i>Rumex crispus</i>	Curly Dock	SNA
<i>Sagina procumbens</i>	Procumbent Pearlwort	S4S5
<i>Salix pyrifolia</i>	Balsam Willow	S4
<i>Sarracenia purpurea</i>	Northern Pitcher-Plant	S5
<i>Scirpus cyperinus</i>	Cottongrass Bulrush	S3S4
<i>Scutellaria lateriflora</i>	Mad Dog Skullcap	S3
<i>Senecio vulgaris</i>	Old-Man-In-The-Spring	SNA
<i>Sium suave</i>	Hemlock Water-Parsnip	S3S4
<i>Solidago macrophylla</i>	Large-Leaf Goldenrod	S5
<i>Solidago rugosa</i>	Rough-Leaf Goldenrod	S5
<i>Solidago uliginosa</i>	Bog Goldenrod	S5
<i>Sorbus americana</i>	American Mountain-Ash	S4S5
<i>Sparganium americanum</i>	American Bur-Reed	S3
<i>Sparganium angustifolium</i>	Narrow-Leaf Bur-reed	S5
<i>Stellaria media</i>	Common Starwort	SNA
<i>Symphyotrichum novi-belgii</i>	New Belgium American-Aster	S5
<i>Symphyotrichum puniceum</i>	Swamp Aster	S5
<i>Thalictrum pubescens</i>	Tall Meadow-Rue	S5
<i>Thelypteris noveboracensis</i>	New York Fern	S4
<i>Triadenum fraseri</i>	Marsh St. John's-Wort	S5
<i>Trichophorum cespitosum</i>	Deergrass	S5
<i>Trientalis borealis</i>	Northern Starflower	S5
<i>Trifolium hybridum</i>	Alsike Clover	SNA
<i>Trifolium pratense</i>	Red Clover	SNA
<i>Tussilago farfara</i>	Colt's-foot	SNA
<i>Vaccinium angustifolium</i>	Late Lowbush Blueberry	S5
<i>Vaccinium oxycoccos</i>	Small Cranberry	S5
<i>Veronica americana</i>	American Speedwell	S4
<i>Viburnum nudum</i>	Northern Wild Raisin	S5
<i>Vaccinium angustifolia</i>	Lowbush Blueberry	S5

None of the species provided by NLWD (i.e., Small Waterwort (*Elatine minima*), Golden Hedge Hyssop (*Gratiola aurea*), Acadian Quillwort (*Isoetes acadensis*), Little Floating Heart (*Nymphoides cordata*), Large-leaved Bog Orchid (*Platanthera macrophylla*), Eastern Purple Bladderwort (*Utricularia purpurea*), and Long-leaved Stitchwort (*Stellaria longifolia*) were observed within the boundaries of the Assessment Area, and no Species at Risk or of conservation concern were observed.

4.3 Rare Lichen Surveys

Rare lichen surveys were completed during three separate visits (two of which were considered preliminary surveys that targeted the identification of suitable habitat) and the third was the dedicated effort in all areas of medium to high potential for Boreal Felt Lichen and Blue Felt Lichen. These targeted areas consisted primarily of mature balsam fir forests adjacent to wetland or waterbody areas (for Boreal Felt Lichen) and deciduous stands with yellow birch (for Blue Felt Lichen).

While completing the rare plant surveys following transect lines to specific, previously identified high potential areas, the SEM biologist and botanist team documented all areas encountered that had elevated potential for Boreal Felt Lichen, Graceful Felt Lichen, and Blue Felt Lichen.

The Assessment Area is situated in a region known to have significant numbers of Boreal Felt Lichen thalli (in particular Hall's Gullies and Lockyer's Waters). The nearest known occurrences of Blue Felt Lichen are located in Sir Robert Bond Park in Whitbourne, less than a kilometer from the Assessment Area boundary (COSEWIC 2010). However, there were no thalli of Boreal Felt Lichen, Graceful Felt Lichen, or Blue Felt Lichen observed during comprehensive surveys of all medium to high potential habitats. Abundant medium and high-quality habitat existed for Boreal Felt Lichen and Graceful Felt Lichen, with several stands of mature balsam fir adjacent to wetlands, but no observations were made of these species. In addition, very few observations were recorded of *Coccocarpia palmicola* (a lichen often found in association with Boreal Felt Lichen).

Blue Felt Lichen surveys were conducted in the stands of yellow and white birch that existed on the ridges in the center of the property, especially on the slopes leading towards the lowland wetlands. No observations were recorded of Blue Felt Lichen in these stands. Although some species of lichen like *Lobaria pulmonaria* were somewhat common, many of the boles of these trees did not have high lichen species diversity or abundance.

4.4 Species at Risk

During the three separate visits to the Project Area during the Rare Flora and Rare Lichen surveys no observations were made of SAR or the existence of critical habitat listed for SAR possible for the area. There were, however, habitat types used by some SAR possible for the Project Area specifically, avifauna SAR. Two SAR species possible for the Project Area were determined to have high potential for using the Project Area based on the presence of habitat important for the foraging and nesting for each species. Red Crossbill perchna (*Loxia curvirostra percna*) and Rusty Blackbird (*Euphagus carolinus*) were observed to have an elevated potential to use the area based on this habitat identification.

4.4.1 Red Crossbill Percna

Red Crossbill percna is a subspecies in Newfoundland which is listed federally under SARA schedule 1 as Threatened and is listed provincially as of July, 2022 as Threatened under the NL ESA. The percna subspecies is a distinct taxonomic group inhabiting the island of Newfoundland, the surrounding islands, and the Anticosti Island of Quebec. The main threats to the population appear to be competition with non-native, invasive, or problematic native species for food competition or nest predation from nest predators like the introduced red squirrel (*Tamiasciurus hudsonicus*).

This species previously relied on red pine (*Pinus resinosa*) and eastern white pine (*Pinus strobus*) but due to the decline in the abundance of those species, it depends on other coniferous cone-producing species like black spruce and white spruce. Conserving coniferous forests at the age of cone production (i.e., 15-25 years of age) is essential to recovering the species on the island of Newfoundland. Currently, there isn't defined Critical Habitat associated with this subspecies. The Project area does contain suitable foraging and nesting habitat as it prefers to nest high in mature coniferous trees with dense foliage cover (COSEWIC 2012).

4.4.1.1 Mitigation

To mitigate the effects of this development in the Project Area on Red Crossbill, land-clearing will occur outside of the breeding season for zone D3-4 from Environment and Climate Change Canada's nesting calendar, mid-April to mid-August, to the extent possible. If land-clearing must occur during that temporal window, targeted surveys for Red Crossbill will be undertaken prior to any development or removal of coniferous forest stands of cone-producing age. SEM is experienced in surveying for breeding birds using an amalgamated approach incorporating an "atlassing" technique to collect data from auditory, visual, and behavioral observations (e.g., food-carrying, agitation, courtship rituals, etc.).

If nests were discovered during surveys, the Proponent would consult with NLWD (and ECCC if necessary) to determine a course of action. At a minimum, a 30-meter radius buffer will be established around each nest (but may be enlarged to 50 meters or greater, based on consultations with authorities). A larger buffer zone may also be required based on the site-specific characteristics or disturbance type (e.g., blasting, tree-clearing, etc.). The buffer will be maintained until the time the young have fledged the nest.

4.4.2 Rusty Blackbird

The Rusty Blackbird (*Euphagus carolinus*) was listed as Special Concern by SARA in 2006 and under the NL ESA as Vulnerable in 2007. This species is widely distributed in the Boreal regions of Canada, breeding in all Canadian provinces in wooded wetlands of the boreal forest (COSEWIC 2017). The species is associated tightly to Boreal and Taiga Forest wetlands in the breeding season occurring in sedge

meadows, beaver ponds, muskegs, swamps, scrub riparian habitats of islands, lakes, and rivers (COSEWIC 2017). Threats associated with the decline of this species have been largely attributed to the loss of wetland habitat from development. This Project Area contained several treed wetlands that could be marginally suitable Rusty Blackbird nesting habitat.

4.4.2.1 Mitigation

To mitigate the effects of this development in the Project Area on Rusty Blackbird, land development will occur outside of the breeding season for zone D3-4 from Environment and Climate Change Canada's nesting calendar, mid-April to mid-August, to the extent possible. If land-clearing must occur during that temporal window, targeted surveys for Rusty Blackbird will be undertaken prior to any development in, or adjacent to wetlands. SEM is experienced in surveying for breeding birds using an amalgamated approach incorporating an "atlassing" technique to collect data from auditory, visual, and behavioral observations (e.g., food-carrying, agitation, courtship rituals, etc.).

If Rusty Blackbird nests were discovered during surveys, the Proponent would consult with NLWD (and ECCC if necessary) to determine a course of action. At a minimum, a 30-meter radius buffer will be established around each nest (but may be enlarged to 50 meters or greater, based on consultations with authorities). A larger buffer zone may also be required based on the site-specific characteristics or disturbance type (e.g., blasting, tree-clearing, etc.). The buffer will be maintained until the time the young have fledged the nest.

5.0 References

COSEWIC. 2010. COSEWIC assessment and status report on the Blue Felt Lichen *Degelia plumbea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 42 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

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<https://www.canada.ca/content/dam/eccc/migration/sara/8bb77ec2-1ba6-4ac7-93be-a7fb882a08f8/sara-eng.pdf>

Newfoundland and Labrador Endangered Species Act. 2004.

<https://www.assembly.nl.ca/legislation/sr/statutes/e10-1.htm>



Appendix A

ACCDC S-Ranking Code

Appendix A – ACCDC S-Ranking Code

S-Rank	Definition
SX	Presumed Extirpated - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
S1	Critically Imperiled - Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2	Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
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.
S4	Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	Secure - Common, widespread, and abundant in the province.
SNR	Unranked - Nation or state/province conservation status not yet assessed.
SU	Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA	Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#	Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SH	Possibly Extirpated (Historical) —Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
Not Provided	Species is not known to occur in the province.



Appendix B

Assessment Area Photographs



Typical pondside habitat in the Assessment Area.



Riparian wetland habitat in the Assessment Area.



Typical bog habitat within the Assessment Area.



Yellow and white birch were prevalent on slopes and hilltops within the Assessment Area.



Many of the yellow birch were relatively devoid of arboreal lichens.



Appendix C

Endangered Species Permit

