Lichen Survey for the Proposed Access Road at the Big Triangle Pond Mineral Exploration Site Eagleridge International Limited

Submitted to:

Department of Environment and Conservation,

Government of Newfoundland and Labrador

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Executive Summary

Erioderma pedicellatum (Boreal Felt Lichen) exists in relatively low numbers worldwide. Originally found in Europe in Norway and Sweden for a period, the species had only been known to occur in Eastern Canada in Nova Scotia and Newfoundland (Maass and Yetman, 2002). This rare lichen thus requires protection and management in current areas in which it exists, and new search efforts must remain high to determine any potential new locations within the province as well as in other jurisdictions.

Subsequently, most proposed development work in Newfoundland and Labrador, especially on the Avalon Peninsula, through the Environmental Assessment process, requires the facilitation of lichen surveys to determine if *E. pedicellatum* may be present, in addition to *Erioderma mollissimum* (Vole Ears Lichen). While it has been determined that there are currently greater than 14,000 *E. pedicellatum* thalli in the province, according to new estimates from the provincial Department of Natural Resources, *E. mollissimum* has only been found at six different sites on the Avalon Peninsula, with a total of 23 juveniles and 153 adults (Environment Canada, 2014).

This report highlights the methods utilized to conduct the lichen survey at the Big Triangle Pond site with a description of what sections of the proposed 11 km access road were surveyed in the fall of 2014, winter of 2015 and summer and fall of 2015. Nine days of surveying was conducted in a joint effort by both Eagleridge International Limited and the Wildlife Division of the provincial Department of Environment and Conservation, facilitated by helicopter, snowmobile and foot. Overall, 5 *E. pedicellatum* thalli and 0 *E. mollissimum* thalli were discovered. Other significant uncommon species found include *Lichinodium sirosiphoideum* and *Parmeliella parvula*.

As such, a 20 m buffer will be maintained between each tree containing *E. pedicellatum* thalli and the proposed access road. This is consistent with the 5 Year Management Plan as outlined by the Wildlife Division of the provincial Department of Environment and Conservation.

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1.0 Introduction

In accordance with the Newfoundland and Labrador Environmental Assessment Act, and as a condition of the Environmental Assessment release, Eagleridge International Limited has conducted a Boreal Felt Lichen (*Erioderma pedicellatum*) survey in the immediate vicinity of the proposed access road for the Big Triangle Pond project. This survey was conducted to ensure no *Erioderma* thalli exist in the planned route of the proposed access road. *Erioderma pedicellatum* is currently listed under the provincial *Endangered Species Act* as vulnerable and endangered under the federal *Species at Risk Act* (SARA). *Erioderma mollissimum* (Vole Ears Lichen) is also listed as endangered under *SARA*.

1.1 Background Information

1.1.1 Past Survey Work near Project Site

A previous *E. pedicellatum* survey has been performed in the Salmonier Line area in 2007 by Jacques Whitford Limited. To cover an approximate total area of 56.2 km, a two person survey crew took 11 days and surveyed approximately 28.1 km on each transect. This survey focused particularly on host trees which measured less than 10 cm in diameter, with forest stands already pre-selected. Areas deemed not suitable for *Erioderma* such as bogs were removed from surveying effort. All stands which had a canopy closure greater than 75% (class 1) were not sampled or surveyed. Special attention was given to forest stands aged approximately 40 years or older, with significant proportions of balsam fir (*Abies balsamea*) and epiphytic lichens present, as well as topography described as scrub and transitional areas around wetlands. Site data sheets were completed for each site surveyed and then tabulated in electronic format. In total, 644 hectares were surveyed.

In Newfoundland and Labrador, surveying for *E. pedicellatum* has been mostly classified as opportunistic in nature, with the first discovery dating back over 30 years (Wiersma and Skinner, 2011). Concentrated survey efforts became established in 1998 (Wiersma and Skinner, 2011). Most efforts have concentrated on looking for known hotspots with already established abundances (Wiersma and Skinner, 2011). Consequently, the majority of surveys have been facilitated by roadsides and trail access routes near already established hotspots, resulting from the difficulty of survey work (Wiersma and Skinner, 2011). Gaining access to locations that are even a few kilometers from roads and trails is considered to be both difficult and time consuming, as Newfoundland is classified as largely unpopulated in nature (Wiersma and Skinner, 2011). Adding to the difficulty of conducting *E. pedicellatum* surveys on the island of Newfoundland is the rocky and hilly terrain, which encompasses many gulches, ravines and rivers that are hard to navigate effectively (Wiersma and Skinner, 2011). Compounding this problem is the high occurrence of fog and wind in the spring, summer and fall seasons, and ice during the winter, as well as difficult coastline access (Wiersma and Skinner, 2011).

1.1.2 Surveyor Information

Lesley Sullivan has completed the MFNNR, Miawpukek First Nations Natural Resources Department, *Erioderma pedicellatum* (Boreal Felt Lichen) Identification Seminar in Conne River, NL, in addition to a course administered by the Forestry and Agrifoods Agency on the Avalon Peninsula. This constituted classroom-based learning and training, followed by fieldwork identifying *E. pedicellatum* in its natural habitat, in both *Erioderma* "hotspots" for insular Newfoundland.

To serve as a guide for the area, as well as to help ensure the surveyor's safety, Bradley Chislett accompanied the surveyor during each survey effort. Mr. Chislett has great expertise regarding the terrain and layout of the Big Triangle Pond site and was able to direct the surveyor as to where the proposed access road is to be built to ensure that all sensitive areas adjacent were adequately surveyed. Lesley Sullivan holds an undergraduate degree in Environmental Science (Biology Stream) from Memorial University's Grenfell Campus and a Master's of Environmental Science degree from Memorial University, with a thesis specializing in trail construction and environmental best management practices. Through her undergraduate work, she has experience in executing common survey protocols such as line transects and point counts, with extensive identification practice specializing in the taxonomy of Newfoundland flora.

The MFNNR identification seminar field training encompassed recognizing *E. pedicellatum* habitat, identifying tagged *E. pedicellatum* thalli in the field and differentiating between *E. pedicellatum* and common indicators species such as *Coccocarpia palmicola*. This involved surveying areas in which no species were tagged, correctly identifying the species, flagging them and learning how to properly complete field data sheets. These are the data sheets submitted to appropriate regulatory agencies such as the Department of Environment and Conservation to maintain data and inventories of *Erioderma* occurrences throughout the province. This entailed providing GPS start and end waypoints as well as location specifics such as aspect, crown closure, slope, gradient, soil moisture, stand age, tree species present and any indicator species.

When *E. pedicellatum* was discovered, the following data and characteristics were recorded on field data sheets:

- i) GPS waypoints (i.e. start and end points);
- ii) Diameter at breast height of the host tree;
- iii) Tree species;
- iv) Tree age (i.e. young or mature);
- v) Developmental stage of the thallus (i.e. juvenile, adult or necrotic);
- vi) Necrosis level (i.e. loose, regenerating or dead).

Once the tree and thallus data was recorded, the species was marked with flagging tape, with two pieces located approximately 6 inches apart on the trunk. Although not found throughout the duration of the course, if *E. pedicellatum* is located on the branches of the tree, one piece of flagging tape would be placed on the trunk, with one on the branch. To help locate the species for future monitoring, the tape was tied such that the knots were

located directly under the thallus to indicate orientation. Digital photographs were also taken of all species found.

1.1.3 Erioderma pedicellatum Description

E. pedicellatum is characterized as a foliose, cyanolichen with a typical diameter between 2 to 5 cm, with the potential to measure up to 12 cm (Maass and Yetman, 2002). These lichens are arboreal and epiphytic, and are located in areas that have cool, humid oceanic climates (Keeping and Hanel, 2006). The lobes of the thallus are involute in shape, or curled upward along their margins, with undersides that are white in color (Maass and Yetman, 2002). The coloration of the thallus fluctuates depending on weather conditions (Maass and Yetman, 2002). When the thallus is hydrated, it appears bluish- gray due to the presence of the cyanobacterium *Scytonema* (Maass and Yetman, 2002). Alternatively, when the thallus is dry, the color appears dark gray to grayish brown (Maass and Yetman, 2002). The upper surface of the thallus of *E. pedicellatum* contains hairs which may either be poorly developed or prominent, and are described when visible as stiff in nature (Maass and Yetman, 2002; Galloway and Jorgensen, 1987).

E. pedicellatum is distinctive in the field due to the presence of apothecia, which are a disk or cup-shaped ascocarp. Once the thallus attains a diameter of at least 1.0 cm, these short-stalked fruiting bodies develop up to a diameter of 1.5 mm (Maass and Yetman, 2002). When the thallus matures, they reach an average diameter of at least 2-5 cm, sometimes reaching up to 10 cm or more (Maass and Yetman, 2002). The margins of these apothecia are typically fringed with whitish hairs, and eventually become scattered along the upper surface of the thalli, with up to 100 per thallus documented (Maass and Yetman, 2002).

Currently, *E. pedicellatum* is classified as critically endangered worldwide by the International Union for the Conservation of Nature (IUCN). On the island of Newfoundland, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has classified the species as Special Concern and the Newfoundland and Labrador provincial government has listed the species as vulnerable under the *Endangered Species Act.*

1.1.4 Erioderma pedicellatum Habitat

E. pedicellatum is located in habitat characterized as Sub-oceanic where *Sphagnum* mosses are abundant (Maass and Yetman, 2002). In Newfoundland in particular, *E. pedicellatum* can be located on or near east-west running forested ridges of unique geological formations (Maass and Yetman, 2002). *E. pedicellatum* is typically located on north or east facing exposed slopes as they generally have a constant supply of moisture (Maass and Yetman, 2002). In these sub-oceanic areas, thalli are most commonly found on balsam fir (*Abies balsamea*) trees, and to a lesser extent black spruce (*Picea mariana*), as well as rarely on the following tree species: white spruce (*Picea glauca*), red maple (*Acer rubrum*) and white birch (*cf. Betula cordifolia*) (Maass and Yetman, 2002). On these trees, *E. pedicellatum* is mostly situated on the trunk and branches, depending on variables such as the level of moisture and light (Maass and Yetman, 2002). *E.*

pedicellatum is usually found in close association with the liverwort *Frullania tamarisci* ssp. *Asagrayana* (Maass and Yetman, 2002).

Because thalli of *E. pedicellatum* are photophilous, they often are located on trees at or near the bottom of slopes, in habitats that are open and in close proximity to *Sphagnum*-rich wetlands (Maass and Yetman, 2002). Other accurate indicators of *E. pedicellatum* habitat are mature forests with the presence of cryptogram species and distinct herbaceous species such as the following: *Clintonia borealis, Coptistrifolia, Cornus canadensis, Gaultheria hispidula and Osmunda cinnamomea* (Maass and Yetman, 2002). Beard lichens in the crowns of trees are also indicators of *E. pedicellatum* presence and the most common associated include *Usnea longissima, Alectoria sarmentosa* and *Bryoria trichodes ssp. Trichodes* (Maass and Yetman, 2002).

1.1.5 Distribution of *Erioderma pedicellatum* in Newfoundland

Currently, there are two main areas of *E. pedicellatum* thalli concentrations, which include Bay d'Espoir and the Avalon Peninsula (Environment Canada, 2010). Research has determined that these two main areas are somewhat divergent, and thus may be completely isolated (Environment Canada, 2010). Formal protected areas constitute more than half of the known E. pedicellatum thalli, which include Wilderness Reserves, Provincial Parks as well as the Salmonier Nature Park, where 25 thalli were discovered at 3 different sites over an approximate area of 14.55 km² (Environment Canada, 2010). However, the majority of protected thalli are presently located in the Bay d'Espoir region (Environment Canada, 2010). Alternatively, less than 5% of known thalli in reserves and parks are found on the Avalon Peninsula (Environment Canada, 2010). Extensive surveying facilitated between 1998 and 2008 have identified the 2 distinct hyperpopulated regions ("hotspots") as the Avalon population within the Lockyer's Waters region and near the Jipujijkuei Kuespem Provincial Park in Bay d'Espoir (Wiersma and Skinner, 2011). The combination of these two hotspots constitutes approximately 96% of the known individual thalli presently in Newfoundland (24 and 72% of the entire known population, respectively) (Wiersma and Skinner, 2011).

Discoveries made in south central Newfoundland constituted areas between Great Burnt Lake, the Twin Brooks area to Northwest of Highway 362, Jipujijkuei Kuespem Park, Hermitage Bay and Belle Bay areas (Maass and Yetman, 2002). Prior to 1995, a total of 483 thalli were discovered on various tree types: 280 thalli on balsam fir, 199 on black spruce and 4 on red maple (Maass and Yetman, 2002). After 1994, a total of 2675 *E. pedicellatum* thalli were discovered, with 2671 on balsam fir and 5 on black spruce (Maass and Yetman, 2002).

Discoveries on the Avalon Peninsula were localized to Lockyer's Waters, Ripple Pond, Ninth Fox Pond as well as Noseworthy's Gully (Maass and Yetman, 2002). During the past 3 to 4 years, the total count for *E. pedicellatum* thalli on the Avalon Peninsula is approximately 2148, with 2085 located on balsam fir and 63 on black spruce (Maass and Yetman, 2002). The Lockyer's Waters population recorded approximately 900 thalli in total by the end of 1997, with 500 on balsam fir within 10 sub sites (Maass and Yetman, 2002). This number has been most recently adjusted to 953 thalli (Maas and Yetman,

2002). These sites encompass an approximate area of 20 hectares, while most trees with *E. pedicellatum* would only cover 5.54 hectares (Maass and Yetman, 2002).

In the Ripple Pond Road population, a total of 350 thalli have been discovered, with 18 located on black spruce (Maass and Yetman, 2002). After 1994, this constituted the second largest habitat for occurrences of *E. pedicellatum* on black spruce (Maass and Yetman, 2002). Two subpopulations, approximately 600 m apart, were located in woodlands about 300-350 m behind the western shores of Ripple Pond, for a total count of 154 thalli, covering an area up to 300,000 m² (Maass and Yetman, 2002). The Ninth Fox Pond population recorded 95 thalli on 70 trees of balsam fir, with 39 located on branches, as well as 9 thalli on black spruce, at 2 sub sites (Maass and Yetman, 2002). The final population of *E. pedicellatum* thalli on the Avalon Peninsula is the Noseworthy's Gully population, with 122 thalli discovered on approximately 65 balsam fir at one site, with a few thalli on numerous black spruce (Maass and Yetman, 2002). An interesting discovery also yielded a few thalli northward at Pegs Pond on the Carbonear Line (Maass and Yetman, 2002).

Discoveries of *E. pedicellatum* thalli have also been made on the Great Northern Peninsula, Burgeo, the Burin Peninsula and east central Newfoundland (Maass and Yetman, 2002). Discoveries on the Great Northern Peninsula yielded 23 thalli before 1995, all located on balsam fir (Maass and Yetman, 2002). In Burgeo, there were two main sites where *E. pedicellatum* discoveries were made (Maass and Yetman, 2002). In the northern area of Burgeo Road, 22 thalli were found on balsam fir, with one thallus on black spruce, located between the Trans-Canada Highway and Peter Strides Pond (Maass and Yetman, 2002). On the headlands of Grandy Brook, *E. pedicellatum* was only recorded after 1994, with 88 thalli all on balsam fir (Maass and Yetman, 2002).

On the Burin Peninsula, which encompasses the peninsula as well as the nearby islands in Placentia Bay, 12 thalli were discovered on balsam fir and 1 thallus on the trunk of white spruce before 1995 (Maass and Yetman, 2002). In east central Newfoundland, areas included the pond-rich sub-oceanic Bay du Nord Wilderness area and the areas between Glovertown and Come-By-Chance, with 125 thalli discovered on balsam fir, with the majority found near Goobies before 1995 (Maass and Yetman, 2002). After 1994, 128 thalli were recorded in the Bay du Nord Lake District (Maass and Yetman, 2002).

Figure 1 below depicts the proposed access road in relation to *E. pedicellatum* occurrences for insular Newfoundland. The proposed access road is to be built as highlighted in yellow, ending an approximate 3 km away from the highlighted Avalon Wilderness Reserve. The black arrow in the bottom right corner of figure 1 points to the locality of the project site, which is highlighted by a yellow circle.



Figure 1: Depiction of the proposed access road in relation to

E. pedicellatum distribution in insular Newfoundland.

(Modified from Environment Canada, 2010).

1.1.6 Erioderma mollissimum (Vole Ears Lichen) Description

Erioderma mollissimum, Vole Ears Lichen, is characterized as a leafy lichen, large in size with a felty, grey-brown upper surface that when moistened has the ability to turn grey-green (Environment Canada, 2014). The thallus of *E. mollissimum* has a diameter of up to 12 cm and is composed of radiating, loosely attached lobes that measure up to a width of 1 cm (Environment Canada, 2014). The thallus lacks an outer protective layer on the lower surface and is densely hairy and light-brown in color, except near the pale, bare margins (Environment Canada, 2014). Along the lobe margins, reproductive structures are produced that are granular and bluish in color, and can also be located in tiny patches.

on the upper surface of older lobes (Environment Canada, 2014). Near the parent thallus, *E. mollissimum* can also sometimes be located in clusters of individuals, resulting from regeneration or fragmentation (Environment Canada, 2014). The cyanobacterium *Scytonema* is the photosynthetic component of *E. mollissimum*, which is also found in the lichens *Lichinodium sirosiphoideum* and *Coccocarpia palmicola*. These lichens are both sometimes found in similar habitats of *E. mollissimum* and are therefore a good indicator of its presence (Environment Canada, 2014).

1.1.7 Erioderma mollissimum Habitat

In Atlantic Canada, *E. mollissimum* can be found at elevations less than 200 m within 30 km of the coast (Environment Canada, 2014). These areas are typically highly humid coastal forests, which due to fog and rain receive large amounts of moisture, often exceeding 1400 mm annually (Environment Canada, 2014). Consequently, *E. mollissimum* is often located in or very near to wetlands (Environment Canada, 2014). Within the province, *E. mollissimum* is typically located in mature to over-mature coniferous forest patches, with the dominant tree type being balsam fir (Environment Canada, 2014). These patches of balsam fir are usually found in areas which are imperfectly to poorly-drained, flat to gently sloping fragmented landscapes and contain coniferous stands in differing age classes (Environment Canada, 2014). However, initial observations in the province infer that *E. mollissimum* is located on particularly slow growing trees (Environment Canada, 2014).

The herbaceous layer associated with *E. mollissimum* habitat is dominated by *Osmunda cinnamomea* (cinnamon fern) with *Sphagnum* moss species occurring at a total ground cover of 70% or more (Environment Canada, 2014). *E. mollissimum* in the province is often found growing on or alongside liverworts, most commonly *Frullania* species, with Bryophyte species dominated by *Hylocomium, Pleurozium, Sphagnum, Ptilium, Rhytidiadelphus and Bazzania* (Environment Canada, 2014).

1.1.8 Distribution of Erioderma mollissimum in Newfoundland

As of 2012, in Newfoundland and Labrador, *E. mollissimum* was discovered on 10 trees at six different sites on the Avalon Peninsula, with a total of 23 juveniles and 153 adults (Environment Canada, 2014). However, for Eastern Canada, a GIS-based prediction distribution model was developed for the species, with indications that population size and distribution may be larger than originally thought (Environment Canada, 2014). Figure 2 below depicts occurrences of *E. mollissimum* in Atlantic Canada, displaying the discoveries made on the Avalon Peninsula in Newfoundland.



Figure 2: Distribution of Erioderma mollissimum in Atlantic Canada

(Environment Canada, 2014).

1.1.9 Project Site Ecoregion: The Avalon Forest

The Big Triangle Pond area is situated within the Avalon Forest ecoregion. The Avalon Forest ecoregion constitutes a sheltered outlier that is situated in the more exposed and open Maritime Barrens ecoregion (Natural Resources, 2015). It consists of pure stands of balsam fir, along with a mixture of yellow birch and white birch (Natural Resources, 2015). Black spruce is abundant on wet site types while trembling aspen is rare (Natural Resources, 2015). Unlike the surrounding Maritime Barrens ecoregion, the Avalon Forest did not undergo episodes of fire, which converted the landscape to open heathland (Natural Resources, 2015). This 500 km² ecoregion is also considered to be unique due to its excessively moist climate and ribbed moraine topography (Natural Resources, 2015).

The Avalon Forest has excessive fog frequency that can be seen by the high abundance of pendant lichens that hang from the branches of balsam fir (Natural Resources, 2015). Depending on aspect, south facing slopes are dominated by *Clintonia*-balsam fir and *Nemopanthus-Kalmia*-black spruce with an abundance of *Taxus canadensis*. North facing slopes are dominated by *Dryopteris*-balsam fir (Natural Resources, 2015). The area consists of gleyed ferro-humic podzols with loam to silt loam texture (Natural Resources, 2015). The forests in this ecoregion are prone to climatic stress from wind and generally rare, under stocked sites have *Ericaceous* heath vegetation on slope summits with raspberry and birch (Natural Resources, 2015).

The Avalon Forest ecoregion is categorized by cool summers and cold winters, with summers known to have higher fog frequencies than the surrounding Maritime Barrens (Ecological Framework of Canada, n.d.). The mean annual temperature of the ecoregion is approximately 5.5° C, with a mean summer temperature of 11.5° C, and a mean winter temperature of -1° C (Ecological Framework of Canada, n.d.). The ecoregion averages a mean annual precipitation range of 1400 to 1500 mm. The Avalon Forest ecoregion is part of the Appalachian peneplain and thus consists of a mix of late Precambrian sedimentary and volcanic rocks (Ecological Framework of Canada, n.d.).

2.0 Methods

Survey methods utilized for this *Erioderma* survey were consistent with the survey protocols published by the Wildlife Division of the provincial Department of Environment and Conservation, which can be found in appendix C. Such protocols follow pre-determined transects at approximate lengths of 100 m per hectare in areas determined to be suitable habitat for *Erioderma* growth. For each transect, at least 40 trees were surveyed per hectare, concentrating on balsam fir and examining the trunk area from the ground up to 2.5 m as well as the branches. To date, no surveying protocols have been developed for *Erioderma mollissimum* in Newfoundland and Labrador. As a result, extra caution was given to examining and taking photographs of any unknown lichen species that bore any resemblance to the species. As consistent with section 5 of survey protocol B for *E. pedicellatum* surveying published by the Wildlife Division, protocol C was followed in these circumstances.

Prior to the start of surveying, the proposed area was delineated to predict potential areas of *E. pedicellatum* abundance. The project site for the proposed access road on the Avalon Peninsula is made up of forest, water and bog. As *E. pedicellatum* is an arboreal lichen, water bodies and bogs were removed from the total area to be surveyed, as was done in the previously mentioned Salmonier Line survey performed by Jacques Whitford Limited in 2007. The project site encompasses approximately 609.09 hectares of bog and 424.52 hectares of lakes.

Forest stands were pre-selected using topographic maps obtained from the provincial Department of Natural Resources and targeted stands containing significant compositions of balsam fir and to a lesser extent, black spruce. Host trees less than 10 cm in diameter and at least 40 years in age were aggressively targeted. All forested areas with a stand crown closure of >75% (class 1) were not surveyed. Site data sheets, attached in Appendix A, were completed for each site surveyed.

The project site contains very moist soils, with a high proportion of transitional areas such as forested patches lining the edges of bogs. The area also contains extensive blow down areas as well as numerous forest patches where significant moose browse on balsam fir is evident.

Search effort was concentrated at the bases of north facing slopes and areas bordering on open peat lands. Transition zones were also targeted, which contain a mix of both balsam

fir and black spruce. Effort also focused on stands of old-growth balsam fir, with the majority of trees having an average diameter at breast height (dbh) ranging from 6-9 cm although trees in these stands can also have diameters as low as 3 cm, up to a maximum of 16 cm or more.

Indicator species found at the site included *Coccocarpia palmicola*, *Lobaria scrobiculata* and *Lichinodium sirosiphoideum* in addition to the liverwort *Fruallania*. When found, search efforts switched to survey protocol B as outlined in the survey protocols by the Wildlife Division in Appendix C. This included searching an additional 100 m per hectare as well as surveying an additional 40 trees or more.

The first four days of surveying completed by Eagleridge International Limited occurred in October of 2014 and February of 2015, as depicted below in figure 3. During this survey effort, a helicopter was utilized in October to maximize search effort in addition to the use of snowmobiles in February. Survey lines are highlighted in yellow, with the proposed access road route highlighted in red.



Figure 3: Eagleridge survey effort - October 2014 and February 2015.

Days 5, 6 and 7 of surveying took place on June 23rd, 24th and 25th by the Wildlife Division of the provincial Department of Environment and Conservation. These tracks are depicted below in figure 4.



Figure 4: Wildlife Division survey effort - June 2015.

Day of 8 of surveying took place on September 3rd, 2015 as a joint effort between Eagleridge and the Wildlife Division at sites pre-determined following an aerial survey facilitated by helicopter. This was to determine high, medium and low probability areas pre-defined by polygons supplied by the Wildlife Division. Day 9 of surveying took place the following day on September 4th, 2015. This survey effort is depicted below in figure 5.



Figure 5: Eagleridge and Wildlife Division joint survey effort - September 2015.

Figure 6 below displays the total surveying effort to date at the proposed Big Triangle Pond site. The three *Erioderma pedicellatum* occurrences are highlighted in blue.



Figure 6: Total survey effort to date, with *E. pedicellatum* occurrences highlighted.

3.0 Results

Overall, 5 adult thalli of *E. pedicellatum* have been discovered at the Big Triangle Pond site. These areas of occurrences can be seen in figures 5 and 6. The first adult thalli was found on September 3^{rd} , 2015, the second and third adult thalli on two adjacent trees on September 4^{th} , 2015 and thalli four and five were discovered on the same tree on September 4^{th} , 2015. Thalli four and five were deemed to have high levels of necrosis, at a rank of 4 and 3, respectively. Table 1 below depicts the waypoints and locations were the thalli were discovered, with figures 7 through 11 depicting photographs of all thalli. All thalli were discovered in relatively wet areas and in close association with the indicator species *Coccocarpia palmicola*. For detailed information on site conditions, refer Appendix A for site data sheets for each *E. pedicellatum* discovery.

Table 1: Erioderma pedicellatum occurrences at the Big Triangle Pond site.

Waypoint	UTM Easting (NAD 83)	UTM Northing	Number of Adult BFL	Number of Juvenile BFL
Sep3tree1a	0333124	5240825	1	0
Sep4tree1a	0334549	5241692	1	0
Sep4tree2a	0334549	5241692	1	0
Sep4tree1b	0331797	5239365	1	0
Sep4tree1c	0331797	5239365	1	0

Note: *Erioderma* waypoints Sep4tree1a and Sep4tree2a have the same GPS coordinates, as they were located less than 5 m apart; Sep4tree1b and Sep4tree1c also have the same GPS coordinates as they were found on the same tree.



Figure 7: First thalli - September 3rd, 2015.



Figure 8: Second thalli - September 4th, 2015.





Figure 10: Fourth thalli - September 4th, 2015.



Figure 11: Fifth thalli - September 4th, 2015.

4.0 Recommendations

Although 5 adult thalli of *E. pedicellatum* were discovered, each thalli was an approximate distance of at least 20-30 m away from the route of the proposed access road. As such, a 20 m buffer from the proposed access road will be maintained for each tree bearing *E. pedicellatum* by the EM, under supervision of the HSE Manager. This is consistent with the 5 Year Management Plan outlined by the Wildlife Division of the provincial Department of Environment and Conservation.

5.0 Works Cited

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Appendix A

Field data reports

		Spec	ies: Erioderm	a pedic	ellatum/E. moll	issimu	m			
General Location: _ Date:lo / ン	Big Triangle 2114 Ob	land pservers: L	esley Su	llium						
Segment Transect number number*	(Reconnaissance, Tra Erioderma survey) na	ack Start me** Waypoint	End Start Waypoint time	End time	Stand # (Forest Inventory)	Stand size (ha)	Tree species present	# of trees of each species checked	Photo Waypoint	Photo direction
1	Erioderma	Start site I	End Site 1				bFibs	40		
2	Erioddina	Start	End				LE 45	40		
	Eriederna	Start.	Endste3	-	-	-	LELC	110		
3	Surgey	site 3	C-1				pi, by	90		
4	Survey	site 4	site, 4				16F. 65	40		
5	Eriodetria	start	Ends				bE.bs.Ws	40		
	Eriodena	Start	End	-		-	IFIC	140		
6	Survey	site6	sites	-			B1 b>	40		
7	SULVEM	site	site.7				6F,65	40		
8	Eriodentia	Start	Ends				bF bS	40		1
	Erisderka	start	End	-			LELC	140		
9	Friedonte	site 7	site				61, 63	TU		
10	Survey	sitelo	site lo				bF, 65	40		
11	Erioderka	Start	Engli				GE LS	40		
	Eriodeting	start	End				151	10		-
12	survien	site 2	site	-			bribs	40		-
13	SURVEY	site 13	site 13				bF, bS	40		
14	Eriodertra	Starty	Endiy				LF LS	40		1
	Eriodeima	start	End	-			DI DI	10		
15	Survey	sitels	sites				101,05	40		1

* A transect for a stand can be composed of several segments, either done by different observers or with some sort of "break", such as another stand transect, in the middle

** Several transects can be grouped in a single saved GPS track if waypoints separating the segments are clearly identified

Comments:

General Loc Date: 0	ation:	Big Trian.	gle f	ord lars.	ester	Selli	van						
Segment T	ransect umber*	Type of transect (Reconnaissance, Erioderma survey)	Track	Start Waypoint	End Waypoint	Start	End	Stand # (Forest	Stand size	Tree species	# of trees of each	Photo	Photo
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* A transect ** Several tra Comments:	for a stand ansects car	can be composed on the grouped in a sire	of several ngle save	segments, d GPS trac	either done k if waypoi	e by diffe nts sepa	erent obs rating th	ervers or with som e segments are cle	e sort o arly ide	f "break", such a ntified	as another stand trans	sect. in the n	hiddle

	1	Block	#	Site Name		Locat	tion Big Tri	ungle Pond	Explo	ration	Area	
Start t End til	time::	AM	o PM	Start Wpt # Start Site	1	GPS cool	rdinate (UTM N rdinate (UTM N	NAD83) 5302	36	E 523	7874	N
Date:	24/10/20 dd/mm/yy	14_		Observers: Bradle	y Chist	ett,	Lesley	Sulliva	2		_	_
Size o	of search area:			Site Revisit Details:		_			_			
Soil M Very Wet Mois Mesi Dry	loisture: y wel st ic	Stand A You Sen a moi a Edg Age:	age/condition: ng Mature escent st or wet scrub e of Blowdown	Tree species: (check all that are present) & balsam fir % black spruce a red maple a white spruce a yellow birch a other % white birch	Crown closure: □ 0-25% □ 26-50% ★51-75% □ 76+ %	Slope: Aspect: Gradient:	⇒ upper slope Xmid slope □ Lower or to 5 □ %	□ crest □ flat □ depression	Indicato	r lichens: carpia palmi a scrobicula odium sirosip pannaria ahl	cola ta bhoideum neri	
Stand	comments (Moose)	prowsin	o of regeneration	etc.):								
Tree in	nformation:	tou c		Tree age/ condition /health: (Young, mature, overmature.		Lichen in	formation:	Luna	Taxa	1	Line 1	
ree (GPS wpt.	Dbh	species	dead, broken, leaning, collaps	sed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
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Site #	1_2	Block	k#	Site Name		Loca	tion Big T	nungle ten	d Explo	ration SI	te	
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End t	lime::	D AM	o PM	End Wpt #EndSite	2	GPS coo	rdinate (UTM N	AD83) 330	505	E 523	3051	N
Date:	29/10/2 dd/mm/yy	2014		Observers: Bradle	, Chisle	tt,	Lesley S.	ulivan				2
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Size of search area:		Tree species: (check all that are present) g balsam lir A black spruce u red maple a white spruce g yellow birch a other a white birch	Revisit Details: e species: eck all that are present) closure: □ 0-25% □ 2-65% eldow birch □ other □ 0+175% Aspect: □ 76+% Gradient: <u>5</u> □ % 20eg □ 0 20							nicola ata iphoideum Ineri		
Stand	comments (Moos	e browsin	g of regeneration	n etc.):					_			
Tree i	information:			Tree age/ condition /health:		Lichen in	formation:					
Tree	GPS wpt	Dbh	species	dead, broken, leaning, collaps	sed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
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bala	End time::	_ D AM	D PM	End Wpt # End Site 3	_	GPS coo	rdinate (UTM I	NAD83) 330 5	565	E 523	\$105	N
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Sold Molecure: Stand age/condition: The species: Crown Stand specicalition: The species: Crown Stand specicalition: Indicate r latence: Indicater latence: Indicater latence: Indicater latence: Indicater latence: Indicater latence: Indicater latence:	Size of search area:			Site Revisit Details:				_			_	
Stand comments (Moose browsing of regeneration etc.) Tree age/ condition /health:	Soil Moisture: 5 Very wet 42Wet 5 Moist 5 Mesic 6 Dry	Stand Pou Ser moi Edg Age:	d age/condition: ung Mature nescent ist or wet scrub ge of Blowdown	Tree species: (check all that are present) (balsam fr àblack spruce red maple = white spruce () yellow birch = other white birch	Crown closure: 0.25% 26-50% 5.51-75% 0.76+ %	Slope: Aspect: Gradient:	Dupper slope	Deg	Indicato n Cocco n Lobari n Lichina n Fusco Other	or lichens: icarpia palmi a scrobicula odium sirosip pannaria ahl	icola ta phoideum Ineri	
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deeUponspeciesdead, broken, learning, collapsed)# uvernile# adult#Nec# thec.# thec.# thee.Reg# DeadComments111 <th>Free information:</th> <th></th> <th></th> <th>Tree age/ condition /health: (Young, mature, overmature)</th> <th>/ /</th> <th>Lichen in</th> <th>formation:</th> <th></th> <th></th> <th></th> <th></th> <th></th>	Free information:			Tree age/ condition /health: (Young, mature, overmature)	/ /	Lichen in	formation:					
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Rare Lichen Inventory Data Sheet circle all applicable: Eriodenna pedicellatum Erioderma mollissimum Decella plumbea

Site #	Block #	Site Name	Location Dick Tria	agletand Exploration Site
Start time::	D AM O PM	Start Wpt # ShASite5	GPS coordinate (UTM NAD83)	330817 E 5238576 N
End time::	AM DPM	End Wpt # EndSites	GPS coordinate (UTM NAD83)	536939 E 5238629 N
Date: 29/10	2014	Observers: Bradley	Chislet, Lesley S.	dlivan
Size of search area:		Site Revisit Details:		
Soil Moisture:	Stand age/conditio a Young X[Ma] a Senescent a moist or wet scrub a Edge of Blowdowr Age: be browsing of regeneral	n: Tree species: Crown (check all that are present) closure ≥ balsam fir)+black spruce 0 0.25 □ red maple ⊃ white spruce 1 0.26-5 □ typellow birch □ other 0.76+ □ while birch 1 0.76+	Slope: upper slope cree >= mid slope flat Lower or toe deg 0% 5% 6 Asped: Gradient: o % XDeg	Indicator lichens: In Coccocarpia palmicola In Lobaria scrobiculata In Lichinodium sirosiphoideum In Lichinodium sirosiphoideum In Fuscopannaria ahlneri Other
Tree information:	101.11	Tree age/ condition /health: (Young, mature, overmature	Lichen information:	
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End time:	_: 0 AN	A a PM	End Wpt # EAASite	6	GPS coo	rdinate (UTM N	IAD83) 351	13	EDAS	1569	N
Date: 29	10/2014		Observers: Brad	ey Chi	selt	, Lesler	, Sulliva	n			_
Size of search ar	ea:		Site Revisit Details:	/				_			
Soil Moisture:	Star	nd age/condition:	Tree species:	Crown	Slope:	a upper slope	p crest	Indicator	lichens:		
D Very wet	a Yo	oung Mature	(check all that are present)	closure:	1.1	in mid slope	o flat	Coccoc	carpia palmi	icola	
n Moist	0.00	oist or wet scrub	red manle o white conver	n 26.50%		M Lower of too	e o depression	D Lobaria	scrobicula	ta	
a Mesic	in Ec	ige of Blowdown	velow birch a other	151-75%	Aspect:			D Euscon	annaria abl	pholoeum	
a Dry		China Changeline		0 76+ %	Gradient:	radient: 10 0% XDeg			onnana ani	1031	
	Age	Age: 0 white birch Other									
Stand comments	(Moose browsi	ng of regeneration	etc.):								
Tres information			Tree and an dition (health		(interview)				-		
Tree CDP unt	IDEE	lanneico	(Young, mature, overmature.		Lichenin	tormation:	Tana	F			
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Size	of search area:			Site Revisit Details:	-							
Size of search area: Stand age/condition: X Very wet a Young a Wet s Senescent a Moist a moist or wet scrub a Mesic a Edge of Blowdown a Dry Age:		Tree species: (check all that are present) y balsam fir's black spruce red maple o white spruce le yellow birch o othero white birch	Crown closure: 0.25% 26-50% %51-75% 0.76+ %	Slope: Aspect: Gradient:	□ upper slope ≫mid slope □ Lower or too	in crest in flat in depression	Indicato D Cocco D Lobaria D Lichino D Fuscop Other	r lichens: carpia palmi a scrobiculai dium sirosip pannaria ahl	cola la hoideum neri	S.		
Stan	d comments (Moos	e browsin	g of regeneration	i etc.):			_			_	_	
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Site # 8	Block #	Site Name		_ Location By Triangle	Pond Exploration Si-	fe
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Date:	2014	Observers: Gradle Site Revisit Details:	yChi	slett, Cesley Sulliva	n	
Soil Moisture: Very wet Wet Moist Mesic Dry	Stand age/condition: Young \st Mature Senescent moist or wet scrub Edge of Blowdown Age:	Tree species: (check all that are present) (balsam fir of black spruce or red maple of white spruce of vellow birch of ther white birch	Crown closure: 0-25% 26-50% 51-75% 76+ %	Slope: upper slope crest ornid slope filat ornid	Indicator lichens: D Coccocarpia palmicola D Lobaria scrobiculata D Lichinodium sirosiphoideum Fuscopannaria ahlneri Other	
And a second second second	asa browsing of regeneration	ate 1:				

				(Young, mature, overmature,							
ree	GPS wpt	Dbh	species	dead, broken, leaning, collapsed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
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10								-			
10		-			-			-			
19					-			-		-	
20		-					-	-	-		
21								-		-	
22								-		-	
23		-			-			-			
24		-			-		-	-		-	
25	21					-		1			

Site #	Block	k#	Site Name		Locat	ion Dig T	riungle	Pond	Explorati	ion Si	te
Start time::_		D PM	Start Wpt # Start Sit	e9	GPS coor	dinate (UTM N	AD83) 333	542	E 524	10215	5 N
End time::_	a AM	n PM	End Wpt # End Site 9		GPS coor	dinate (UTM N/	AD83) 333	\$67	E 5240	379	N
Date: 29 16	2014		Observers: Gradle	y Chis	lett, l	lestery	Sulliva	n			
Size of search area:	2		Site Revisit Details:	/		2					
Soll Moisture: > Very wel 	Stand Ser moi Edg Age:	d age/condition: ing Mature nescent ist or wet scrub ge of Blowdown	Tree species: (check all that are present) it balsam firm black spruce or red maple o white spruce vellow birch o other o white birch	Crown closure: □ 0-25% □ 26-50% Ø(51-75%) □ 76+ %	Slope: Aspect: Gradient:	inid slope Lower or toe	Crest	Indicato Cocco Lobari Lichino Fusco Other	r lichens: carpia palmid a scrobiculat dium sirosip pannaria ahlr	cola a hoideum neri	
Stand comments (Moo	ose browsin	g of regeneration	etc.):								_
Tree information:			Tree age/ condition /health:		Lichen inf	ormation:					
Tree GPS wpt.	Dbh	species	dead, broken, leaning, collaps	ed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
1											
1 2											
1 2 3											
1 2 3 4											
1 2 3 4 5 6											
1 2 3 4 5 6 7											

Site # 10	Block #	Site Name		Loca	tion big	Triangl	< Peri	d Exploration	n Ste
Start time::	AM PM	Start Wpt # Start site	10	GPS coo	rdinate (UTM NA	D83) 333	350	E 5241388	N
End time::	O AM O PM	End Wpt # End Site 10		GPS coo	rdinate (UTM NA	D83) 333	682	E 5241571	N
Date: 24 10 3 dd / min/s	out_	Observers: Bradley Site Revisit Details:	Chiste	ett, L	esley S.	ullivan			-
Soil Moisture: Very wet Wet Moist Mesic Dry	Stand age/condition: > Young > Mature > Senescent = moist or wet scrub = Edge of Blowdown Age:	Tree species: (check all that are present) b blasam fir bolack spruce or ed maple o white spruce d yellow birch o other	Crown closure: 0.25% 26-50% x51-75% 0.76+ %	Slope: Aspect: Gradient:	mupper slope mid slope to Lower or toe	crest fat depression	Indicato Cocco Lobaria Lichino Fuscop	r lichens: carpia palmicola a scrobiculata dium sirosiphoideum vannaria ahlneri	
				-			1 0010		
Stand comments (Moo	se browsing of regeneration	etc.):					_		
Stand comments (Moc	se browsing of regeneration	etc.): Tree age/ condition /health:		Lichen in	formation:				-

Tree GPS wpt,	Dbb	species	dead, broken, leaning, collapsed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
1	1000							1		
2									1.2.2	
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5				11. N		a la successione			1	1
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8				1.						1.
9				1.				2		
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12	1.1									
13										1
14					-				(i i i i i i i i i i i i i i i i i i i	
15								1		10.00
16				111						1
17	1.1									
18		-				1.1		1.000		
19		-						12 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		
20	1.1			1		-				
21				1.1			1			
22				1.			1			
23										
24					11.000	-				
25	1.1			-			-			

Rare Lichen Inventory Data Sheet circle all applicable: Erioderma pedicellatum Erioderma mollissimum Degelia plumbea

Site #	Block #	Site Name	Location Big Triangle Pond Eploration Site
Start time:: End time::		Start Wpt # Start Site	GPS coordinate (UTM NAD83) <u>33654</u> E 524197 <u>3</u> N 1 GPS coordinate (UTM NAD83) <u>33960</u> E 5241981 N
Date: 29/10/ dd/mm/	2014	Observers:	ey Chislett, Lesley Sullivan
Soil Moisture:	Stand age/condition: a Young Mature a Senescent	Tree species: (check all that are present) (balsam fir cblack spruce	Crown Stope: □ upper stope □ crest Indicator lichens: closure: □ mid stope □ flat □ Coccocarpia palmicola □ 0.25% □ Lower or toe □ depression □ 0.50% □ Lower or toe □ depression

Stand comments (Moose browsing of regeneration etc.):____

Tree age/ condition /health: (Young. mature, overmature, dead, broken, leaning, collapsed) Tree information: Lichen information: Tree GPS wpt. Dbh species # juvenile # adult #Nec #Nec-L #Nec-Reg # Dead Comments 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

one - 1 -	Block	«#	Site Name	_	Local	tion Big Tri	langle Von	d Exp	location	Ste	
Start time::	o AM	o PM	Start Wpt # Start Ste	12	GPS coor	dinate (UTM N	AD83) 334(1	159	E 5241	964	N
End time::	MA a	PM	End Wpt # EndSite12		GPS cool	rdinate (UTM N	AD83) 3340	656	E5242	464	N
Date: 29/10/2	014		Observers: Bradley	Chile	H, Le	sley Sall	luan			_	_
Size of search area:	_		Site Revisit Details:			/					
Soil Moisture:	Stand	age/condition:	Tree species:	Crown	Slope:	n upper slope	o crest	Indicato	r lichens:	_	
D Very wet	I You	ing A Mature	(check all that are present)	closure:	1.401	cumid slope	o flat	II Cocco	carpia palmi	cola	
a yvet	⊐ Sen	escent	a balsam fir A black spruce	0-25%		A Lower or to	e depression	a Lobaria	a scrobiculat	ta	
a Moist	o moi	st or wel scrub	a red maple a white spruce	26-50%				a Liching	dium sirosip	phoideum	
a Wesic	DEdg	e of Blowdown	y yellow birch a other	A 51-75%	Aspect:	In IC	1 Dec	D Fuscor	pannaria ahl	neri	
TUNY	Age:		o white birch	1 104 %	Gradient:	10-17 0%	pueg	Other			
Stand comments (Moos	e browsin	g of regeneration	etc.):								
Tree information:		10.000	Tree age/ condition /health:	-	Lichen in	formation:	0.0		1.11		
Res Lichen Inventory Data Sheet Cited all applicable: Endoting and mission Dage all admits Site #											
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3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21											
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3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23											
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23											

Site #7	Block #	Site Name	Location Big Trian	gle rend Exploration Site						
Start time::	□ AM □ PM	Start Wpt # Start Site 13	GPS coordinate (UTM NAD83) GPS coordinate (UTM NAD83)	335326 E 524259/ N 335258 E 35555 N52429						
Date: 29/10/	DOLU_	Observers: Bradley Chis	lett , Lesley Sulliv	an						
Size of search area:_		Site Revisit Details:	/							
Soil Moisture: Urery wet Wet Moist Mesic Dry Stand comments (Mo	dof mm/ yy of search area: Moisture: ry wet Stand age/condition Young ×(Mature) Senescent Senescent moist or wet scrub esic ry Age: nd comments (Moose browsing of regeneration e information: GPS wpt. Dbh species 1 Dbh species 3 Age Age	on: Tree species: Crown ature (check all that are present) v:Dalsam fir >Dplack spruce b Gred maple n white spruce m A; yellow birch other 76+ % ation etc.):	ree species: Crown sheck all that are present) balsam fir ≵black spruce red maple □ white spruce yellow birch □ other while birch tc.): tc.): terest Blope: □ orest □ upper slope □ orest □ mid slope ★ flat □ Lower or toe □ depression □ Lobaria scrobiculata □ Fuscopannaria ahlneri Other							
Tree information:		Tree age/ condition /health:	Lichen information:	Contractor and the						
Tree GPS wpt	Dbh species	(Young, mature, overmature, dead, broken, leaning, collapsed)	# juvenile # adult #Nec	#Nec-L #Nec-Reg # Dead Comments						
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13 14 15 16 17 18 19 20 21 22 23 24										

Site #	14	Block	#	Site Name		Loca	tion Big Tr	nangle	fond E	xplorat	ion S	NOC
Start	time::	D AM	n PM	Start Wpt # Start Ste	14	GPS coo	rdinate (UTM N/	AD83) 335	301	5243	122	N
Endt	ime: :	AM	PM	End Wpt # End Site	4	GPS coo	rdinate (UTM NA	AD83) 3351	61	E 524	3 387	N
	0.1.1			Q NI	AL.	1.11	1 1	~ 11		- drai	201	
Date	dd/mith/yy	14_		Observers: Grad	eyCh	sleft	, hesley	Sulliva	n			-
Size	of search area:			Site Revisit Details:	-							
Soil I	Moisture:	Stand	age/condition:	Tree species:	Crown	Slope:	o upper slope	a crest	Indicato	r lichens:	-	
a Ver	y wet	a You	ng %Mature	(check all that are present)	closure:	1.1.1.1	a mid slope	x flat	Cocco	carpia palmi	cola	
N.VVe		□ Sen	escent	to balsam fir a black spruce	0-25%		D Lower or toe	depression	D Lobaria	scrobiculat	a	
MOI	SI	- mol	a of Bloudours	red maple is white spruce	26-50%	Accest			Lichino	dium sirosip	hoideum	
o Mes	SIC	d Eug	e or blowdown	Scyellow birch is other	A 31-7370	Gradient	P - 0/ 4	Dee	- Fuscor	bannaria ahli	nen	
uny		Age:		a white birch	1110+ 70	Gradient	a % (Eneg	Other			
Stand	d comments (Moose	prowsing	g of regeneration	etc.):								
Tree	information:			Tree age/ condition /health:	1	Lichen in	formation:					
ree	GPS wpt	Dbh	species	dead, broken, leaning, collaps	sed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
1		100	1	Other states of the second states of the								
2			1						1.00			
3	1											
4												
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6									-			
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8			1									
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10		1000							-		-	
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10		1					-					
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13		1				-			-	-		
14		+			_	-			-			
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16		-				-		-			1.000	
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16 17 18 19 20 21							-					
16 17 18 19 20 21 22												
16 17 18 19 20 21 22 23												
16 17 18 19 20 21 21 22 23 24												

	Data Sheet circle all app	olicable: Erioderma pedicellatum Eri	oderma mollissimum De	egelia plumbea	-		
Site #_15	Block #	Site Name	Location Si	g Finagle	bond Epde	ation Site	
Start time::		Start Wpt # Start Site 15	GPS coordinate (UT	TM NAD83) 332	1546 E 5	243695 N	
End time::	D AM D PM	End Wpt # ENDERTE	GPS coordinate (UT	TM NAD83) 33	767 E5	243957 N	
Date: 20102	514	Observers: Bradley ()	vislett, Leske	g Salliva,	Ŧ		
Size of search area:		Site Revisit Details:					
Soil Moisture: D Very wet Wet D Moist D Mesic D Dry	Stand age/conditio	n: Tree species: Crow ure (check all that are present) closs balsam fir (r black spruce red maple o white spruce keyellow birch o other	Slope: uppers Jre: yr, mid slop 25% u Lower 5-50% Aspect: 5+% Gradient:	lope crest pe flat or toe depression	Indicator liche Coccocarpia Lobaria scrot Lichinodium Fuscopannar Other	ns: palmicola piculata sinssiphoideum ia ahlneri	
Stand comments (Mod	se browsing of regenerat	ion etc.):					
Tree information:		Tree age/ condition /health: (Young, mature, overmature,	Lichen information:	ų.	0.5.5.8		
Tree GPS wpt.	Dbh species	dead, broken, leaning, collapsed)	# juvenile # adult	#Nec	#Nec-L #Nec	-Reg # Dead Comments	
1			_				
2							
3							
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6							
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10 11							
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3 10 11 12 13 13 14 15 16 16							
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3 10 11 12 13 14 15 16 17 18 19							
3 10 11 12 13 14 15 16 17 18 19 20							
3 10 11 12 13 14 15 16 17 18 19 20 21							

Site #	16	Block	k#	Site Name		Loca	tion Big	Triande	fond	Explorat	ions	ite
Start	time: :	D AM	D PM	Start Wpt # StartSite	16	GPS coo	dinate (UTM N	AD83) 334 5	57	E 5244	084	N
End t	ime:	AM	D PM	End Wot #		GPS coo	dinate (UTM N	AD8313344	89	E 504	440	T N
-ind t					14 A	010000	uniate (o i m i	(AD03)		e Jan	1.10.	N
Date:	29/10/20 dd / mm/ yy	14		Observers: Gradle	y Chist	ett, I	lesley S	ullivan				
Size o	of search area:			Site Revisit Details:					-			
Soil M Ven Wet Mois Mois	Moisture: y wet st sic	Stand A You Ser moi Edg	d age/condition: ing @Mature nescent st or wet scrub je of Blowdown	Tree species: (check all that are present) balsam fir sblack spruce red maple white spruce yellow birch other	Crown closure: 0-25% 26-50% x51-75%	Slope:	a upper slope extmid slope a Lower or too	□ crest □ flat e □ depression	Indicato II Cocco II Lobari II Liching Fusco	r lichens: carpia palmic a scrobiculat odium sirosip pannaria ahlr	cola a hoideum neri	(
a Dry					0 76+ %	Gradient:	5-10 0%) Deg	1.000			
-		Age:		a white birch		-	2		Other		_	
Tree i Tree	nformation: GPS wpt	Dbh	species	Tree age/ condition /health: (Young, mature, overmature, dead, broken, leaning, collaps	sed)	Lichen in # juvenile	formation:	#Nec	#Nec-L	#Nec-Rea	# Dead	Comments
1								1		-		
2								-			-	
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5 6 7 8 9 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 23												

Date: 02 11	1115	Observ	lond vers:_L	esley	Sulliv	an			_			
Segment Transect number number*	Type of transect (Reconnaissance, Erioderma survey)	Track name**	Start Waypoint	End Waypoint	Start time	End time	Stand # (Forest Inventory)	Stand size (ha)	Tree species present	# of trees of each species checked	Photo Waypoint	Pho
1	Ericderna		start siten	End	9:52	11:16			6Fibs	40		
2	Eriodernik		start 8	End 18	11:40	12:50			bF, bs	40		
3	SUVVEY		start9	End 19	1.10	1:55			6F, 65	40		
4	EV											
5												
6												-
7												
8								1			1	-
9					1			-	-	1	1	-
10				1	1						-	
10	1	1										-
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12											-	
13		-										+
14		1				-						
15			1	1	1			1	1	-		-

Start time: 9: 57 w/M o PM Start Wpt # Start St.te 17 GPS coordinate (UTM NAD83) 334 758 E 52444996 N End time: 1:: 16 w/M o PM End Wpt # End Site 17 GPS coordinate (UTM NAD83) 334 758 E 5244996 N Date: 17/02/2405 Observers: Bradley Childett, Losley Sullivan Start Vpt # End Site 17 GPS coordinate (UTM NAD83) 334 758 E 5244996 N Date: 17/02/2405 Observers: Bradley Childett, Losley Sullivan Start Vpt # End Site 17 GPS coordinate (UTM NAD83) 334 758 E 5244996 N Size of search area: Start wpt # End Site 17 GPS coordinate (UTM NAD83) 334 758 E 5244996 N Size of search area: Start wpt # Start %pt # Sta	et time: \mathcal{Q} \mathcal{SZ} \mathcal{PM} Start Wpt # \mathcal{ST} I time: 11 16 \mathcal{AM} \mathcal{PM} End Wpt # $\mathcal{E}_{\mathcal{P}}$ e: $17/D2/2015$ Observers: $000000000000000000000000000000000000$	utsite 17 GPS coord dsite 17 GPS coord Bradley Chislett	linate (UTM NAD83) 33451. linate (UTM NAD83) 33475 	2 E 5244906 N 8 E 5244996 N
Date: 17/02/045 Observers: Studley Childett, basky Sullivan Size of search area:	e: <u>17/02/2015</u> Observers: 0 ddf/mm/yy Observers: 0 o of search area: Site Revisit Deta	Bradley Chislett	, Losley Sulliv	
Size of search area: Site Revisit Details: Soll Moisture: Young xXMatre Tree species: Crown Slope: upper slope crest Indicator lichens: Coccocarpia palmicola Wet 0 Senescent 26-50%	e of search area:Stand ane/condition:		~	
Soil Moisture: Stand age/condition: Tree species: Crown Slope: upper slope crest Indicator lichens: Cococarpia palmicola v.Vvet Senescent Senest	Mainturn Stand analogn dition: Tree analises	ils:		
Stand comments (Moose browsing of regeneration etc.): Tree information: Tree age/ condition /health: (Young, mature, overmature) Lichen information: 1 0 6 0	Indicators Young Xoung Kature ery wet Young Young (check all that ar fet Senescent Xbalsam fir yola oist Imoist or wet scrub Ired maple in white birch esic Edge of Blowdown is-yellow birch in or ry Age: In white birch	Crown closure: Slope: ck spruce a 0-25% ite spruce a 26-50% ite Spruce a 61-75% a 76+% Gradient:	a upper slope a crest inc s⊄mid slope n flat a C a Lower or toe n depression a L 5 a % b/Deg	licator lichens: Jococcarpia palmicola obaria scrobiculata ichinodium sirosiphoideum iuscopannaria ahlneri Other
Tree information: Tree age/ condition /health: (Young, mature, overmature, 1 Lichen information: Tree GPS wpt. Dbh species dead, broken, leaning, collapsed) # juvenile # aduit #Nec-L #Nec-L # Dead Comment (Ourge, mature, overmature, 1 3 4	nd comments (Moose browsing of regeneration etc.):			
1 1 <th1< th=""> 1 1 1 1<th>e information; Tree age/ conditi (Youno, mature, o GPS wnt IDbb Ispecies Idead broken lea</th><th>ion /health: Lichen info</th><th>prmation:</th><th>ec#Nec.Reg.l# Danit [Comments</th></th1<>	e information; Tree age/ conditi (Youno, mature, o GPS wnt IDbb Ispecies Idead broken lea	ion /health: Lichen info	prmation:	ec#Nec.Reg.l# Danit [Comments
2 3		ing, conductory in foreining i	Food Mites	ser wheeling working to beau comments
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19				
12				

Site	#	Bloc	k#	Site Name	_	Loca	tion Big	Friangle	fard	Explore	tion	Site
Sta	rt time: 11 : 40	MAN	D PM	Start Wpt # StartSite	12	GPS coo	ordinate (UTM N	AD83) 334	196	E 524	1923	N
End	time: 12 : 50	O AM	O-PM	End Wot # End Site R		GPS con	rdinate (UTM N	40831 3340	187	E 5244	965	N
Dat	e: 17/02/2 dd/mm/yy	015		Observers: Bradler	y Chisl	<u>ett</u> ,	Lesleys	ultiran				
	l Moisture: ery wet fet oist esic ry	Stan	d age/condition: ang pc Mature nescent ist or wet scrub ge of Blowdown	Tree species: (check all that are present) a balsam fr ¢black spruce a red maple a white spruce skyellow birch a other	Crown closure: 0-25% 26-50% #51-75% 0 76+ %	Slope: Aspect: Gradient:	Dupper slope A-mid slope Ducwer or toe	crest flat depression	Indicator Coccor Lobaria Lichino	r lichens: carpia palmic scrobiculati dium sirosip pannaria ahlr	cola a hoideum heri	
_		Age:		a white birch					Other			
ree	e information:	Dbh	species	Tree age/ condition /health: (Young, mature, overmature, dead, broken, leaning, collaps	ed)	Lichen in # juvenile	formation:	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
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10		+	-			-		-				
11		1								-		
1:	2	1							-		-	
13	3	1			-			-				
14	1	1						1	-	1		
15	5	1								-	-	
	3							1	-		-	
16	,					1.000	1		-			
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16	3										-	
10	3	-										
16 17 18 19 20	8								-			
10 17 18 19 20 21	3 9 9					-						
16 17 18 19 20 21 22	5 5 7											
16 17 18 19 20 21 22 23	8 9 9 9											
16 17 18 19 20 21 22 23 24												

Site # 19	Block	#	Site Name	_	Loca	tion Big	Friunglet	and E	aplorati	1011 S	ite
Start time::	MA a DI	M	Start Wpt #_ Start Site	19	GPS coo	rdinate (UTM I	NAD83) 334	749	E 524	4614	N
End time: 1 : 5	S AM	D-PM	End Wpt # EndSite A		GPS coo	rdinate (UTM f	NAD83) 3350	396	E 524	4557	N
Date:	уу		Observers: Bradle	y Chisle	tt, Le	sley Sul	lisan				2
Size of search area:	_		Site Revisit Details:			-			_		-
Soil Moisture: P Very wet Sc.Wet Moist Mesic Dry	Stand I You I Sen I mois I Edg	age/condition: ng jx.Mature escent st or wet scrub e of Blowdown	Tree species: (check all that are present) inchalsam fir &black spruce or red maple or white spruce & yellow birch or other or white birch	Crown closure: □ 0-25% □ 26-50% ≠ 51-75% □ 76+ %	Slope: Aspect: Gradient:	Aupper slope in mid slope in Lower or to 20-25 0%	a Crest a flat depression a Deg	Indicato Cocco Lobaria Lichino Fuscoj Other	r lichens: carpia palmi a scrobicula dium sirosip pannaria ahl	cola la hoideum neri	
Stand comments (Mod	ose browsing	g of regeneration	etc.):					_		_	10. 2 million (10. 10. 10. 10. 10. 10. 10. 10. 10. 10.
Tree information:			Tree age/ condition /health:		Lichen in	formation:					
Tree GPS wpt.	Dbh	species	dead, broken, leaning, collaps	sed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
1					-						
2							1				1.0
3			2			1	1	-			
4						1		-	-		
5						1		-			
6								-	-	-	
7					1.00				-	-	
8											
0								-	-		
10								-			
10							-	-	-	-	
11							-		-		
12										-	
13							1	-	-	_	
14							-			-	
15					11-1-1	1	-	-		_	
16											
17					1.1					1	
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20		1				Dr. C.				-	
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20 21 22										Contraction of the second seco	
20 21 22 23							1				
20 21 22 23 24				-	_			-			

G	eneral Lo	oation: 07119	Big Triang 115	Cobserv	ers: l	esley	Selliv	an			_			
s	egment T umber n	ransect umber*	Type of transect (Reconnaissance Eriodermą surve	, Track y) name**	Start Waypoint	End Waypoint	Start time	End	Stand # (Forest Inventory)	Stand size (ha)	Tree species present	# of trees of each species checked	Photo Waypoint	Phot
	1		Erioderma		start 50	End site 20	19:52	10:49			6F,65	40		T
	2		Eriodenta Survey		Start site 21	End	11:00	11:40			bF, bs	40		
	3		L											
	4													
	5													
	6													
	7												_	
-	8									-				-
T	9									-				-
-	10											-	-	1
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T	12									1				+
	12						-	-						
-	10			-										+
	14									+				
•	A transect * Several t Comments	for a stand ransects car	t can be composed n be grouped in a	d of several single save	L segments, d GPS trac	either don k if waypo	l e by diffei ints separ	L rent obse rating the	rvers or with som segments are cl	ne sort c early ide	I If "break", such intified	as another stand trar	nsect. in the r	l middl

Site #	20	Bloc	k#	Site Name		Loca	tion Big	Trinnale	Pard	Frale	ation	Ste
~	Internet inventory Data Sneet Circle all age 20 Block # ime: 1 10 : 49 ime: 10 : 10 : 49 eAM = PM 19 102 2015 of Imm/ yy f search area:			4.451	10			334	174	- COU	1500	Sile
Start	time: 10 . //	9 AN	- PM	Start Wpt # Start Stee	101.00	GPS coo	rdinate (UTM N	AD83) >>++	i ci	E DAT	4202	<u>N</u>
End	ime: <u>10 : 4</u>	I PAM	DPM	End Wpt #	a zite AC	GPS coo	rdinate (UTM N	(AD83)	021	E 224	4112	N
Date:	dd/mm/y	2015		Observers: Bradle	ey Chi	slett,	Lesley	Sulliva	n	_	_	
Size o	of search area:			Site Revisit Details:	_	_						
Soil N Verv s.Wet Mois Mois	foisture: y wet st ic	Stand P You Ser In moi o Edg	d age/condition: ing ist Mature hescent ist or wet scrub ge of Blowdown	Tree species: (check all that are present) à balsam fir & black spruce ir ed maple i white spruce syellow birch i other	Crown closure: 0-25% 26-50% 3-51-75%	Slope: Aspect:	upper slope ir mid slope Lower or too	□ crest □ flat □ depression	Indicato Cocco Lobaria Lichino Fuscor	r lichens: carpia palmi a scrobicula dium sirosip annaria ahl	icola ta phoideum ineri	
Dry					0 76+ %	Gradient:	5-10 0%	*Deg				
		Age:		jo white birch	1				Other			
Stand	comments (Moo	se browsin	g of regeneration	etc.):								
Tree i	nformation:			Tree age/ condition /health:		Lichen in	formation:					
Tree	GPS wpt.	Dbh	species	dead, broken, leaning, collaps	sed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
1		-				10-02		-	100.000	-		
2		-			_			-	-	-	-	
3		-		-		-					-	
4			-					-			-	
5		-						-	-		-	
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-11							-	-			-	
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Site #	Block #	Site Name		Loca	tion Bicy	Triungle	Pond	L Expl	oration	n Site
Start time: \\	D MAN DPM	Start Wot # Start S.1	-21	GPS coo	dinate /UTM	NAD831 333	752	- 524	4016	
End time: 1:	40 a AM PM	End Wpt # End Site	21	GPS coo	dinate (UTM I	NAD83) 333	757	ESA	+4 798	3 N
Date: 19/6:	1 SOK	Observers: Bradle	cy Chist	ett,	Lesley	Sullivan				
Size of search area:		Site Revisit Details:	3							
Soil Moisture: Very wet Wet Moist Mesic Dry	Stand age/condition Young KMatu Senescent moist or wet scrub c Edge of Blowdown Age:	: Tree species: (check all that are present) arbaisam fir xCblack spruce ared maple a white spruce xcyellow birch in other white birch	Crown closure: □ 0-25% □ 26-50% ↓ 51-75% □ 76+ %	Slope: Aspect: Gradient:	$r upper slope x mid slope r Lower or to 5 \sim 10 r %$	e crest flat be depression ADeg	Indicato Locari Lobari Lichino Fusco Other	or lichens: icarpia paln a scrobicul odium siros pannaria al	nicola ata iphoideum nIneri	
Stand comments (M	pose browsing of regeneration	on etc.):								
Tree information:		Tree age/ condition /health		Lichen in	formation:	1.1.1				
Tree GPS wpl.	Dbh species	dead, broken, leaning, collap	sed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Re	g # Dead	Comments
1			_				-	-	-	
2								-	-	
3								-	-	
4								-		-
5						-	-	-		
7							-	-		
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15		-				1	1	1.		
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15 16 17 18 19 20 21 21 22						-				1
15 16 17 18 19 20 21 22 23								-		

General Date:	Location: 02/21	Dig mangi	Observ	ers: L	esley	Sulli	van						
Segmen number	Transect	Type of transect (Reconnaissance, Erioderma survey)	Track name**	Start Waypoint	End	Start	End	Stand # (Forest	Stand size (ha)	Tree species	# of trees of each	Photo	Photo
	1	Enodema		Starts	End site 22	9:05	12:29			6F,65	40		
	2	Erisdermat		start site 23	End site 23	12:38	1:40			bF, bs	40		
	3	Erioderna		Start 4	End 24	2:10	3:50			6F, 65	40		
	4	1		- State State								-	1
	5												1
	8								-		-		
	7												
			-										
	8	-	-										
	9												
1	0												
1	1								-				-
1	2					-	-		-				-
	3			-									
1	4												
1	5												
* A trans ** Sever Comme	ect for a stan	d can be composed c an be grouped in a si	of several ngle save	segments, ed GPS trac	either don k if waypo	e by diffe ints sepa	rent observating the	ervers or with som esegments are cl	ne sort o early ide	f "break", such ntified	as another stand tran	isect. in the r	niddle

Site #	Block #	Site Name		Loca	tion Big	Francie	fond	Explor	ation	Site
Start time: 9 :0	5 HAM a PM	Start Wpt # Start Site	22	GPS coo	rdinate (UTM N	AD83) 335	106	E 524	1507	N
End time: 10 : 10		End Wpt # _ End Site		GPS coo	rdinate (UTM N	AD83) 200	206	EDRA	1 20 1	N
Date:	12015	Observers: Bradle	ey Chis	lett	Lesley	Sullivar				-
Size of search area:		Site Revisit Details:					-			
Soil Moisture: a Very wet a Wet b Moist b Mesic b Dry Stand comments (Moc	Stand age/condition: • Young & Mature • Senescent • moist or wet scrub • Edge of Blowdown Age: • se browsing of regeneration	Tree species: (check all that are present) x balsam fir x black spruce red maple = white spruce x yellow birch = other white birch etc.):	Crown closure: 0-25% 26-50% &:51-75% 0 76+ %	Slope: Aspect: Gradient:	□ upper slope a mid slope □ Lower or to 5-/▷ □ %	□ crest □ flat □ depression ¥Deg	Indicato Cocco Lobari Lichino Fusco Other	r lichens: carpia palmi a scrobicula odium sirosip pannaria ahl	icola ta phoideum Ineri	
Tree information:		Tree age/ condition /health:		Lichen in	formation:					
Tree GPS wpt,	Dbh species	dead, broken, leaning, collaps	sed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
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2		1								
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11						-				
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12 13 14 15 16 17 18 19 20 21 22 21 22 22 22 22 22 22 22										
12 13 14 15 16 17 18 19 20 21 22 23										
12 13 14 15 16 17 18 19 20 21 22 23 24										

Site #	23	Block	c#	Site Name		Loca	tion Big	Triangle	Pone	L Expl	cratic	onsite
Start	time: 12 : 38	_ a AM	erPM	Start Wpt #_SturtSite	23	GPS cool	dinate (UTM N	AD83) 335	476	E 524	1358	Ň
End t	ime: 1 : 40	D AM	₽PM	End Wpt # End Site?	3	GPS cool	dinate (UTM N	AD83) 335	162	E 524	1546	N
Date:	21/02/20 dd/mm/yy	15		Observers: Bradl	ey Chi:	slett,	Lesley	Sullivar	7		_	_
Size o	of search area:	_		Site Revisit Details:	-							
Soil N Ven Wet Mois Mois Mes	Noisture: y wet st sic	Stand You Sen moi Edg	d age/condition: ing yt.Mature escent st or wet scrub le of Blowdown	Tree species: (check all that are present) itcbalsam fir arblack spruce or ed maple of white spruce argent spruce	Crown closure: 0-25% 26-50% 51-75% 764 %	Slope: Aspect: Gradient:	a upper slope ter mid slope a Lower or toe	□ crest □ flat □ depression >Deg	Indicato Cocco Lobari Lichino Fuscoj	r lichens: carpia palmi a scrobicula dium sirosip pannaria ahl	cola lá bhoideum neri	
Stand	comments (Moose b	rowsin	g of regeneration	etc.):		-			1 Ouler			
Tree i	nformation:		1.011	Tree age/ condition /health:		Lichen in	formation:					
Tree	GPS wpt.	Dbh	species	dead, broken, leaning, collaps	sed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
1				the second second second	7 20.00				1	1 Internet		S CONTRAINS
2										1	1000	
3									-	1		
4						-						
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12 13 14 15 16 17 18 19 20 21 21 22												
12 13 14 15 16 17 18 19 20 21 21 22 23												

Site	# 24	Block	k#	Site Name		Loca	tion Big	Fianale	Pond	Explor	ation	Site
Star	t time: <u>3 : 10</u> time: <u>3 : 50</u>	_ n AM _ n AM	ਯ PM ਦਾ PM	Start Wpt # <u>Start Site</u> End Wpt # <u>End Site</u> ?	24	GPS coo GPS coo	rdinate (UTM N	NAD83) <u>334</u> NAD83) <u>334</u> 3	16	E 524	3819	N N
Date	: 21/02/20 dd/mm/yy	15		Observers: Bradle	y Chis	lett,	Lesley S	Sullivan	_			
Size	of search area:	_		Site Revisit Details:	-	_		_	_		_	
Soil Ve W M M M M M	Moisture: ry wet et oist esic y	Stand You Ser moi Edg Age:	d age/condition: Ing AMature rescent ist or wet scrub ge of Blowdown	Tree species: (check all that are present) abalsam fir a black spruce is red maple 0 white spruce x yellow birch 0 other	Crown closure: 0-25% 26-50% K-51-75% 76+ %	Slope: Aspect: Gradient:	upper slope mid slope Lower or to	crest □ flat □ depression	Indicato	r lichens: carpia palmi a scrobicula odium sirosip pannaria ahl	cola la phoideum neri	
Star	id comments (Moose i	prowsin	g of regeneration	letc.):								
Tree	information:			Tree age/ condition /health:		Lichen in	formation:					
Tree	GPS wpt.	Dbh	species	dead, broken, leaning, collaps	sed)	# juvenile	# adult	#Nec	#Nec-L	#Nec-Reg	# Dead	Comments
1		-						-		-		
		-		-	_	-		-		-	-	
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16		-						-				
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15 16 17 18 19 20 21 22 22	2	-		1							1	
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Data: 09	los/15	Big Irian	gle	land, I	Verfor	Hand	nd e	Labrador sley Sulli	van				
Segment	Transect	Type of transect (Reconnaissance, Erioderma survey)	Track	Start	End	Start	End	Stand # (Forest	Stand size	Tree species	# of trees of each	Photo	Photo
1		Erioderma		Sep3stan	Sepsend	9:25	12:41		(1.47	bF.bs			
2		Erioderma		Sep3start	Sep3End	1:04	2:15			bF.b5			
3		Erioderka Survey		Sep3start	Sep3End	2:41	4:54			bF.bs			
4		/											
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	a share	Line			1	1	1		1	James and the second	_	-	1

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Loca	: <u>0910</u> tion: <u>B</u>	3 115 9 Tr	iangle	Observers: Claudi Pond, NewFoirma	a Hanel, Lesley Sullands Labrador	llivan			_GPS site wa	ypoint: Sep 3 Er	ode
Site:	d commen	ts (Moos	e brows	_ Photos: Ing of regeneration etc.):E	UTM: ESDI	10825 Jonx 40	N	*NAD83 D NA Slope We	AD27 25 SE	Accuracy:	1
Soll M ver we Moi n Moi n Moi n Moi n Moi n Moi n Moi Tree I	Moisture: y wet t st sic	Stand p <u>Wpt</u> 1. 2. 3.	hotos: director	Stand age/condition: n Young × Mature n Senescent n Stunted n Krummholtz/Tuckemore n Edge of Blowdown Age: The age/ condition /enter all	Tree species: (check all that are present) a balsam fir a black spruce n red maple n white spruce n yellow birch n other white birch	Crown closure: □ 0-25% □ 26-50% ★51-75% □ 76+ %	Slope: Aspect: Gradient	n upper slope n mid slope ≭Clower or toe	n crest n flat n depression n Deg	Indicator lichens: Coccocarpia palmic ri Lobaria scrobiculata n Lichinodium sirosiph <u>p other</u> Sphaceo	ola oideur pha
Tree #	GPS wpt.	Accuracy	species	(Young, mature, overmature, dead, broken, leaning, collapsed	Tree comments		#Adult	#Juvenile	Etiodatma com	manin (nacionale etc.)	-
1	Sep 3tra	e 1.a	6F	Overnature	healthy, Ison d	bh			Dostla L	Henris (necrosis eic.)	Phy
2				a second dependence of the local of the local	M				many n	alling 1	
3									TREPOSIS	ranti 1	
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12 13 14 15 16 17 18			ALC: NO THE OWNER WATER OF THE OWNER OWNER OF THE OWNER OWN	the second					and the second se		

Segment number	Transect number*	Type of transect (Reconnaissance, Erioderma survey)	Track	Start Waypoint	End Waypoint	Start time	End	Stand # (Forest	Stand size (ha)	Tree species	# of trees of each	Photo Wavpoint	Photo
1		Erioderna		Sep 4start	Sep 4 End	7:02	9:58			bF, bS, WB		T	
2		Erioderhia		Sapystat	Septena	10:05	12:01			bE.bs UB			
3		Surg		5115	Silca				1	11-21-17		-	1
4						1						-	1
5													-
E			1										1
7													1
						1							1
						-			-			-	
10									-			-	-
10												-	
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12									-				
13										-		-	
14													-
1/4 8				1	1	1			-			-	

Date: 0910	34 115	Triang	Observers: Claudia Le Pond, Newfor	Hanel, Lesley Sundland & Labradar	lliuan.			_ GPS site wa	ypoint: <u>Scip 4Er</u>	iodern
Site:			_ Photos:	E 524	11692	_ N	×NAD83 n N	AD27	Accuracy:	1
Stand comme	nts (Moos	se brows	ing of regeneration etc.):						-	
Soll Molsture: n Very wet # Wet n Moist n Mesic n Dry	Stand <u>Wpt.</u> 1. 2. 3.	director	Stand age/condition: n Young ⊯Mature n Senescent ∩ Stunted □ Krummholiz/Tuckemore n Edge of Blowdown Age:	Tree species: (check all that are present) a balsem fir a black spruce n red maple n white spruce n yellow birch n other n white birch	Crown closure: □ 0-25% □ 26-50% ☆ 51-75% □ 76+ %	Slope: Aspect: Gradien	≪ upper slope □ mid slope □ lower or toe	n crest n flat n depression n Deg	Indicator lichens: Coccocarpia palmic Lobaria scrobiculate n Lichinodium sirosipi cother Sphaero	noideum phoros
Tree Information	on: Accutacy	y species	Tree age/ condition (enter all th (Young, mature, overmature, dead, broken. Jeening, collapsed)	at apply) Tree.comments		Erioder #Adult	rma information #Juvenlie	Etiodetma.com	ments (nacrosis etc.)	Dhoto#
1 Sep4tr	plas	bF	Overrotive Suppressed	Tree dbh 6.5cm		11		Healthy	mercasis with	1
2 Sep Hr	ice 2a	6F	Overnature	Tree dbh Dom	1	1		OVG 11 7	rullabia mite	+ Jan
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15			Contraction of the second s						n	
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15 16 17 18	a second second									

Loca	tion: Bie	Tri	angle	Pond, Newfair	dlord & Labrador	SCHIVAR	1		GPS site w	aypoint;	Sep 4Er	nødern
Site:				Photos:	UTM:0331797 ESD	39365	N	× NAD83 n	VAD27	Acoura		
Stand	i commer	its (Moo	se brows	sing of regeneration etc.): <u>Por</u>	ninated by Feathe	r moss	, hunr	roctry 1	with sp	hagnu	m	
Soll Molsture: Stand photos: c Very wet <u>Wpl</u> directon Wet <u>1.</u> n Molst <u>2.</u> n Mesic <u>3.</u> n Dry		photos:	Stand age/condition: n ryoung x≤Mature n Senescent n Stunted u Krummholtz/Tuckemore n Edge of Blowdown Age:	Tree species: Crown (check all that are present) closure: a belsem fir a black spruce n 0-25% n red maple n white spruce n 26-50 n yellow birch n other x 51-75* swhite birch n 76+76*		Slope: nupper slope in crest indicator lichens: n mid slope in flat coccocarpia palmicola reflower or toe in depression reflorinodium sirosiphoide Cradient: n % n Dep in other					icola ta bhoideum	
ree l	nformatic	n: Accutat	y species	Tree age/ condition (enter all th (Young, mature, overmature, dead, broken, leaning, collapsed)	at apply)		Erloder	ma Informatio	n:	munula ha		
1	Sep41	tell	> bF	Quernature, Suppressa	Tree dh of Scr	1	I	HJUYEIIIe		mments (neci	(i	Pholo#
2	Sep4 to	ee la	bF	Overnative spore ad	P DIR OF OF		1		Alectosis	rain	7	
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Appendix B

Overview of Survey Effort Maps

Eagleridge Survey Effort for October 2014 and February 2015



Wildlife Division Survey Effort for June 2015



Joint Survey Effort with Eagleridge and Wildlife Division for September 2015



Total Survey Effort to Date for the Big Triangle Pond Site



Appendix C

Erioderma pedicellatum Survey Protocols

Erioderma pedicellatum Survey Protocols

A survey for occurrences of *Erioderma pedicellatum* within the survey area designated on Map 1 shall be done in all forest stands (as identified in the Newfoundland and Labrador Forest Inventory) over 40 years old with a large component of balsam fir where epiphytic lichens are present. The total land area within the boundary of the survey area depicted on Map 1 is approximately 1,020 ha. According to Wildlife Division, 376 ha is not considered potential *Erioderma pedicellatum* habitat, leaving an area of approximately 644 ha to be surveyed. A map of the stands to be sampled with a unique number for each stand (including scrub), hereafter referred to as the stand number, will be supplied. The area of the stands to be sampled will also be supplied in a table. Stands with a crown closure of >75% (class1) do not need to be sampled.

Softwood scrub where excessive moisture is the limiting factor and transitions of productive forest to wetlands should also be searched, and if a scrub patch is large enough to be identified in the Forest Inventory it should be considered a separate stand.

GPS coordinates should be recorded in Universal Transverse Mercator (UTM) North American Datum (NAD) 83. Some GPS units do not have NAD 83 as an option and these should be set to WGS 84.

Start with Protocol A - Reconnaissance.

Protocol A - Reconnaissance

- 1. Walk at least 100 m of transect line per hectare. This transect:
 - does not need to be a straight line, but should pass through the habitat considered to be most suitable for *Erioderma pedicellatum* by the surveyor(s). Special attention should be paid to the transition zones between merchantable stands and scrub stands.
 - can be broken into segments, which can be done in separate locations within the stand as long as the portions add up to 100 m per hectare. If there is more than one surveyor, each can do a transect segment, either in parallel or in separate locations. The segments can cross each other. In large stands it is important that the transect segments provide representative coverage of the entire stand.
 - can cross into an adjacent stand, but if crossing is noticed in the field, a GPS waypoint should be taken. The portions in the different stands should be considered separate transect segments.
- 2. If the stand boundaries are very indistinct in the field, a basic survey intensity of 100 m of transect line per hectare should be maintained. The transects should be relatively evenly spread across the landscape and an effort should be made that no potentially suitable stand remains unsurveyed. GPS tracks can be used to ensure the survey area is adequately covered.

- 3. Search at least 40 trees per hectare along the transect, concentrating on balsam fir. Trees of species other than balsam fir, including black spruce and hardwoods, should be searched when present but should make up no more than 10% of the trees searched along the transect. Only trees old enough to support lichen growth and *Frullania* (>40 years) should be searched. Some old trees can be of a very small diameter (~2.5 cm) and these should be searched. Trees of this diameter that are obviously young do not need to be searched.
- For each tree, visually scan all of the trunk area from the ground to 2.5 m and also the lower branches up to 2m (the part near the trunk without needles) for indicator species and Erioderma pedicellatum.
- If the liverwort Frullannia asagrayana and any of the following five lichens (Coccocarpia palmicola, Erioderma mollissimum, Fuscopannaria ahlneri, Lichinodium sirosiphoideum, Lobaria scrobiculata) are present, record a GPS waypoint and switch to Protocol B -Erioderma pedicellatum survey.
- If any Erioderma pedicellatum, or lichens that the surveyor cannot identify that may be Erioderma pedicellatum, are found, skip directly to Protocol C - Detailed Thallus Survey.
- If the indicators mentioned above are not found, provide the following:
 - A filled in Transect Data Sheet, including the time and GPS waypoints at the start and end of each transect segment, an indication of which transect segments represent which stand, the stand number, stand size, tree species in the stand, the number of each species of tree checked, and the GPS waypoint and direction.
 - GPS track(s) and waypoints marking the beginning and end of transect segments
 - a digital stand photograph per stand which includes something to provide scale

Protocol B - Erioderma pedicellatum Survey

- Survey at least 100 m of transect per hectare in addition to the 100 m in Protocol A. Record a waypoint at the location where the indicator species has been located and note the species. All transect parameters outlined in Protocol A also apply to the *Erioderma pedicellatum* transects.
- Search at least 40 additional trees per hectare, in the same manner as described for Protocol A.
- For large stands >5 ha the extra survey effort needs to be expended in the hectare where the indicator lichen was found.
- Provide the following:
 - GPS track(s) and waypoints marking the beginning and end of transect segments

- A GPS waypoint of the location where the first indicator lichen was encountered
- A data sheet filled out with the same information as in Protocol A
- The names of all the indicator lichens encountered along the transect
- If any Erioderma pedicellatum or lichens that the surveyor cannot identify that may be Erioderma pedicellatum, are found, follow Protocol C - Detailed Thallus Survey.

Protocol C - Detailed Thallus Survey

- Flag the tree with two orange ribbons of winter quality flagging tape, preferably both flags below the thallus, but not within 30 cm of it. Ensure that the ends of the flagging tape are not long enough to damage the thalli if flapping in the wind.
- Provide digital photographs of:
 - the stand to bring the total number of photographs in the stand to three
 - each thallus, and also a photo of the section of the tree with the flags and the thallus (it is especially important to provide a photo if the identity of the thallus is in doubt, and to include something that provides scale in the photo).
- Use the Site Data Sheets to provide the following information:
 - A GPS reading of the coordinates of the tree, including the accuracy of the reading (if several trees are located within 5 m of one another, a single coordinate may be used)
 - The species and condition of the tree
 - The number of juvenile (without apothecia) and adult thalli on the tree, and if applicable, specify % of necrosis and degree of attachment for each thallus
 - Any other noteworthy information about the trees or thalli
 - The time when the Thallus Survey was started and finished
- Search all appropriate balsam fir trees within a 20 m radius of the Erioderma pedicellatum-bearing tree, and repeat steps 1-3 for all thalli found.
- If more than 10 thalli are found in one site, search the lower branches of black spruce as well within the 20 m radius of any new *Erioderma pedicellatum*-bearing tree.
- If no more thalli are found with step 4, resume Protocol B, but not including the trees in the 10 m radii as part of the total transect for the stand.

Appendix D

ACCDC Data for Rare and Provincially/Federally Listed Species for the Big Triangle Pond Site

