

Summer 2007 survey for rare bryophytes at proposed management sites, W.A. Switzer Provincial Park, Alberta¹

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1.0 Survey objectives and methods

The main objective of the summer bryophyte survey was to document the occurrence of rare species at several sites (see below) in W.A. Switzer Provincial Park, Alberta. These sites may either be cleared for the development of new facilities (e.g., trails, parking lots, campgrounds) or maintained for public use by mechanical brushing or gravel deposition, which have the potential to damage or extirpate rare plant populations. Sites were surveyed from August 24-26, 2007, during which time a total of 25 hours of surveying was conducted. Rare bryophytes are defined as those species currently found on the ANHIC

¹ This report should be cited as: Caners, R.T. 2007. Summer 2007 survey for rare bryophytes at proposed management sites, W.A. Switzer Provincial Park, Alberta. Final report to Alberta Tourism, Parks, Recreation and Culture, Edmonton, Alberta.

(Alberta Natural Heritage Information Centre) tracking and watch lists, found at the following website: <http://tprc.alberta.ca/parks/heritageinfocentre/plants/vascularbryophytes/default.aspx>.

Prior to the commencement of the summer survey, rare bryophyte occurrences for the region were obtained from ANHIC. These consisted of two liverworts (*Pellia endiviifolia*² and *Tritomaria scitula*) and three mosses (*Entodon concinnus*, *Orthotrichum affine*, and *Splachnum sphaericum*). Maps, photographs, and other documentation were obtained from Ksenija Vujnovic (Heritage Protection Specialist; Parks, Conservation, Recreation and Sport Division; Alberta Tourism, Parks, Recreation and Culture) before the commencement of the surveys.

Bryophyte surveys were conducted with reference to Doubt and Belland (2000) and used a Floristic Habitat Sampling (Newmaster et al. 2005) approach where important microhabitats were systematically sampled at each location for the presence of rare species. Specimens were collected when identification in the field was not possible and to document the occurrence of common species at the survey sites (**Appendix 1, map of bryophyte collection locations**). Please note that the collection locations depicted in **Appendix 1** do not represent the full extent of areas surveyed. Taxonomic keys used for species identification include BFNA (2007), Crum and Anderson (1981), and Lawton (1971) for mosses, and Schuster (1966-1992) for liverworts. Specimens are to be deposited at the Devonian Botanic Garden, University of Alberta. Digital photographs presented in the summer (**Appendix 3**) and spring (Caners 2007) reports have been deposited on compact disc with Alberta Tourism, Parks, Recreation and Culture.

All sites that required surveying (as outlined in the Memorandum of Agreement for this contract) were visited during the three day sampling period. The following is a list of the sites visited and the activities undertaken at each location:

Graveyard – Cache Lake

1) Proposed backcountry trail

Surveyed a 5-10m band of forest that may be cleared for the construction of a new backcountry trail west of Graveyard and Cache Lakes.

Gregg Lake

1) Expansion to campground loop A

Surveyed a 200x600m area of forest to be cleared for a proposed expansion to campground loop A.

2) New parking stalls

Surveyed a 10x20m area of forest to be cleared for the construction of new parking stalls at the entrance to campground loop A.

3) Development across from campsite #9 of Gregg Lake campground loop A

Surveyed a 30x50m area of forest to be cleared for the development of new facilities.

4) New parking lot

Surveyed a 20x60m area of forest to be cleared for a new parking lot at the lakeside Gregg Lake campground.

5) Gregg Lake trail loop

Surveyed approximately 3km of hiking trails, including a 2-3m buffer on either side, that may be brushed.

6) New group campground

Surveyed a 100x150m area of forest to be cleared for the construction of a new campground.

² *Pellia endiviifolia* was the only pre-survey occurrence that was located inside the Park boundary.

7) Emergency exit road

Surveyed the 5x400m length of the emergency exit road (Hay River road) adjacent to the proposed group campground at Gregg Lake, including a 2-3m buffer on either side that may be brushed.

8) Sanitary treatment building

Surveyed a 50x50m area of forest to be cleared for the construction of a new sanitary treatment facility across from campsite #9 at the Gregg Lake campground (loop A).

9) Amphitheatre

Surveyed an approximately 20m band of forest around the current amphitheatre site that may be cleared for expansion.

2.0 Summary of survey results

2.1 Graveyard – Cache Lake

2.1.1 Proposed backcountry trail

Waypoints 122-139; photos 1830-1858

The proposed trail measures approximately 5.1km in length (based on a GPS tracking interval of 100m) along which a 5-10m wide band of forest was surveyed for rare bryophytes. A large proportion of this forested trail consists of mixed stands of lodgepole pine, aspen, and white spruce (Williams 2007). West-facing slopes and hilltops commonly consist of stands of mature aspen, with balsam poplar becoming more frequent along riparian zones and southern portions of the trail where terrain is fairly level. There are numerous microhabitats important for bryophytes along the trail, including moist mineral soil embankments (**photo 1, Appendix 2**), treefall mounds (**photo 2, Appendix 2**), well-decayed logs and stumps (**photo 3, Appendix 2**), and wet channels or riparian zones. Rocks in a temporarily dry riverbed provide habitat for the aquatic moss *Hygrohypnum luridum* (S3) (**photo 4, Appendix 2**).

The moss *Hypnum pallescens* (currently ranked as S2 by ANHIC) was observed at a single location along the route, at the base of a large aspen tree (**wpt. 131, Appendix 1**) (**sample no. SPP-87, Appendix 3**).

The moss *Splachnum sphaericum* (currently ranked as S2 by ANHIC) was found growing on dung (**wpt. 135, Appendix 1**) (**sample no. SPP-96, Appendix 3**).

The moss *Atrichum selwynii* (currently ranked as S2 by ANHIC) was found at two locations along the trail, and was documented as a single rare plant occurrence because of their fairly close proximity. The species was found growing on mineral soil on a treefall mound and a trailside embankment (**wpts. 137 and 138, Appendix 1**) (**sample SPP-99, Appendix 3**) (**photo 5, Appendix 2**).

The route traverses a variety of habitats and landforms and provides some impressive scenery; however, the clearing of forest for the creation of this new trail system should be carefully considered. The occurrence of rare mosses along the proposed baseline of the trail suggests that the surrounding forests are capable of supporting other rare plants which may be affected by trail development and its subsequent use. The trail runs immediately adjacent to small wetlands and other wet depressions, crosses riparian zones, and meanders up and down glacial moraines without appearing to avoid potentially sensitive habitats. Professional advice from hydrologists and pedologists should be obtained before trail construction begins.

Populations of the rare species *Atrichum selwynii* and *Hypnum pallescens* are subject to damage during trail construction, maintenance, and public use. The dung moss *Splachnum sphaericum* has an annual life-cycle (Hill and Preston 2007) and will likely not be affected by these activities. More extensive surveys should be conducted to better understand the distribution of these and other rare plant species in relation to the current placement of the trail, and whether a different route could reduce potential impacts to potentially sensitive habitats (e.g., spread of invasive species, off-road vehicle access). The creation of this new trail should perhaps be questioned given the rather large network of trails already in place in the Park.

Incidental observations - Wood frog (young of the year); hairy woodpecker; common loon; black-capped chickadees; nuthatches; warblers; common snipe; hawk.

2.2 Gregg Lake

2.2.1 Campground expansion to loop A

Waypoints 140-143; photos 1860-1864

This forested site along the west end of campground loop A at Gregg Lake encompasses approximately 100x600m of forest that is largely dominated by lodgepole pine (Williams 2007). The site is relatively dry and is characterized by an open canopy and a high abundance of shrubs (**photo 6, Appendix 2**). There are relatively few microhabitats important for rare bryophytes at this location; however, small patches of mineral soil at the base of fallen trees, tree bases, and partially-decomposed logs are occasionally encountered. Decayed wood on the forest floor provides habitat for bryophytes including the leafy liverwort *Tritomaria exsectiformis* (S3). No rare bryophytes were encountered at this site.

Incidental observations – Boreal toad (young of the year).

2.2.2 New parking stalls

Photo 1865

This site encompasses approximately 10x20m of forest that consists largely of lodgepole pine with some understory white spruce (Williams 2007). The forest is similar to that found at the proposed expansion to campground loop A (Section 2.2.1, above), with few microhabitats to support rare bryophytes (**photo 7, Appendix 2**). This small and rather isolated site is surrounded by gravel roads and contains evidence of past logging. The most important microhabitats include tree bases and a few decayed logs (**photo 8, Appendix 2**) that provide habitat for bryophytes including the leafy liverwort *Lophozia ventricosa* (S5). No rare bryophytes were encountered at this site.

2.2.3 Development across from campsite #9

Photo 1867

This site is situated across from campsite #9 at the Gregg Lake campground loop A and encompasses approximately 30x50m of forest that is largely dominated by lodgepole pine (Williams 2007) (**photo 9, Appendix 2**). There are few microhabitats important for rare bryophytes at this location. Those present include the bases of large trees, small patches of mineral soil at the base of fallen trees, and the moist undersides of small, moss-covered logs that provide habitat for species including the leafy hepatic *Lepidozia reptans* (S3). No rare bryophytes were encountered at this site.

2.2.4 New parking lot

Waypoints 144-145; photos 1868-1870

This forested site is situated near the lakeside Gregg Lake campground and is where one of the trailheads of the Gregg Lake trail loop begin (Section 2.2.5 below). The site encompasses approximately 20x60m of white spruce and lodgepole pine forest (Williams 2007), which is to be cleared for a new parking lot. There are few microsites important for rare bryophytes at this location (**photos 10-11, Appendix 2**). There are few decayed logs; most are either recently fallen or humified and completely colonized by feathermosses. The forest appears to be fairly disturbed and contains no rare bryophytes.

2.2.5 Gregg Lake trail loop

Waypoints 146-156; photos 1871-1915

This hiking trail is approximately 3km in length and consists of two main segments: one which runs between campground loop L (Lakeside) and loop F (Fox Den), and another section between Gregg Lake and the northern portion of loop F. The trail system was surveyed along its entire length, including a 2-3m buffer on either side. The two segments are dominated by open canopies of lodgepole pine, white spruce, and aspen (Williams 2007). At lower elevations and near Gregg Lake paper birch and black spruce become more frequent.

The trail is wide in most places and is relatively open and dry. Many segments of the trail are dominated by shrubs (especially *Shepherdia canadensis* and *Ledum groenlandicum*) and graminoids. There are few important microhabitats along the trail; however, exposed mineral soil on the trail surface is colonized by generalist bryophytes (**photo 12, Appendix 2**) and mineral soil embankments provide important habitat for many species (**photo 13, Appendix 2**). The dung moss *Tetraplodon angustatus* (S3) was frequently encountered along the loop.

The moss *Atrichum selwynii* (currently ranked S2 by ANHIC) was observed growing with *Bartramia ithyphylla* on a moist mineral soil embankment along the trail (**wpt. 150, Appendix 1**) (**sample no. SPP-114, Appendix 3**) (**photo 14, Appendix 2**).

The moss *Splachnum sphaericum* (currently ranked as S2 by ANHIC) was found growing on dung (**wpt. 155, Appendix 1**) (**sample no. SPP-119, Appendix 3**) (near **photo 15, Appendix 2**).

The moss *Aloina rigida* (currently ranked as S2 by ANHIC) was encountered on a small mineral soil embankment along the trail (**wpt. 157, Appendices 1 and 3**) (**photo 16, Appendix 2**) but was not collected because so few gametophytes were present.

Populations are subject to damage from machinery used for trail brushing and clearing, trail maintenance including gravel deposition, as well as public use of the trail (biking, hiking). Damage to trailside soil embankments should be minimized wherever possible as they provide important habitat for both common and rare species.

Incidental observations - A single sporophyte of *Botrychium* was observed along the trail and documented with photographs (**wpt. 149, Appendix 1**) (**photos 17-20, Appendix 2**). The specimen has been tentatively identified as *B. pallidum* (Graham Griffiths; September 1, 2007) or *B. crenulatum* (Patrick Williston; September 24, 2007). A more extended search for this species should be conducted to assess its current distribution and help provide a more definitive identification.

2.2.6 New group campground

Waypoints 159-165; photos 1916-1936

This site encompasses approximately 100x150m of lodgepole pine, white spruce, and aspen forest (Williams 2007), which is to be cleared for the construction of a new group campground. The canopy is moderately open with relatively high ground-level insolation (**photo 21-22, Appendix 2**). The site has relatively few decayed logs and stumps that are important for bryophyte colonization, and few other notable microhabitats apart from patches of forest floor, bases of large trees (there are some large aspen at this site), and dung. A few patches of exposed mineral soil were found at the base of small windthrown spruce.

The moss *Splachnum sphaericum* (currently ranked as S2 by ANHIC) was found on dung (**wpt. 163, Appendix 1**) (**sample no. SPP-122, Appendix 3**).

The moss *Hypnum pallescens* (currently ranked as S2 by ANHIC) was observed at a single location (**wpt. 164, Appendix 1**) (**sample no. SPP-123, Appendix 3**) (**photo 23, Appendix 2**). This occurrence was combined with the occurrence on the emergency exit road (Section 2.2.7, below) because of their close proximity.

Both species are subject to extirpation from the forest clearing activity required for campground construction. Extended surveys should be conducted to determine their distributions in the area.

2.2.7 Emergency exit road

Photos 1916-1917

The emergency exit road is situated adjacent to the proposed Gregg Lake campground (Section 2.2.6, above). The 5x400m length of the road was surveyed, including a 2-3m buffer on either side that is to be brushed. There are few microhabitats important for bryophytes at this site; however, patches of exposed mineral soil along the edges of the road where natural drainage channels have formed are colonized by generalist species (**photo 24, Appendix 2**).

The moss *Hypnum pallescens* (currently ranked as S2 by ANHIC) was found growing on a small soil embankment at one location (**wpt. 171, Appendix 1**) (**sample no. SPP-132, Appendix 3**). This occurrence was combined with the occurrence at the new group camp (Section 2.2.6, above) because of their close proximity.

2.2.8 Sanitary treatment building

Photos 1957-1959

This small forested site (across from campsite #9 of the Gregg Lake campground loop A) contains approximately 50x50m of lodgepole pine-dominated forest (Williams 2007), which is to be cleared for the construction of new sanitary treatment buildings. There is a high abundance of shrubs (especially *Betula glandulosa* and *Salix* spp.) and ground cover is dominated by *Calamagrostis canadensis* and *Petasites palmatus* (R. Caners, personal observation). The dominant bryophytes at the site are the large forest floor feathermosses *Hylocomium splendens*, *Pleurozium schreberi*, and *Ptilium crista-castrensis*, as well as *Sanionia uncinata*, *Plagiomnium cuspidatum*, *Amblystegium serpens*, and the liverwort *Ptilidum pulcherrimum*, which preferentially grow on wood. There are few microhabitats important for bryophytes at this site, but those present include tree bases and patches of forest floor (**photo 25, Appendix 2**). No rare bryophytes were observed.

2.2.9 Amphitheatre

Photos 1960-1962

The amphitheatre at Gregg Lake covers approximately 15x30m, which is to be expanded to include an area of approximately 20x50m. There are few important microhabitats at this site apart from the bases of large white spruce trees that dominate the area to be expanded (**photo 26, Appendix 2**). The most abundant bryophytes at the site are the forest floor feathermosses *Hylocomium splendens*, *Pleurozium schreberi*, and *Ptilium crista-castrensis*, and the moss *Sanionia uncinata*, which grows on tree bases and woody debris on the forest floor. No rare bryophytes were encountered at this site.

3.0 Mitigation of potential damage to rare species

Important microhabitats for bryophytes at the sites visited during the summer survey include tree tipup mounds and moist patches of exposed mineral soil (including trail surfaces), the bases of large trees, decayed logs and stumps, riparian zones and channels, and boulders. These habitats often contain a large number of common (and occasionally rare) bryophytes and are important for the maintenance of bryophyte diversity in the Park.

Four rare bryophyte species were encountered during the spring (Caners 2007) and summer surveys in the Park, and were documented as 12 rare plant occurrences. These species were observed at a limited number of surveyed sites where maintenance activities (e.g., brushing, gravel deposition) or the development of new infrastructure are likely to occur. Most of the visited sites are not representative of optimal bryophyte habitat and were often found to be open and dry, dominated by shrubs or graminoids, and contain few important microhabitats. The rare species encountered during the surveys do not represent the potential number of rare species likely to be found in the Park if targeted surveys were to be conducted over larger areas of higher quality habitat.

None of the rare bryophytes documented in the Park were relocated to adjacent habitats for the following reasons:

- 1) the plants were too small and delicate (e.g., *Aloina rigida*);
- 2) the plants were locally abundant in nearby areas that were not going to be affected by development (e.g., *Splachnum sphaericum*, found on dung in and around sites);
- 3) the plants were firmly affixed to their substrate and their removal would have resulted in damage to the specimen (e.g., *Hypnum pallescens*);
- 4) the substrate on which the plants were growing was fragile and could not easily be removed and transported to a new location (e.g., dry soil); or
- 5) there were no suitable microhabitats in the area.

Even if suitable microhabitats were present in the vicinity to allow for the relocation of rare plant populations, there is no research evidence to suggest that transplants will be effective. Research on the success or failure rate of transplants for different species is lacking. Instead, all populations were clearly marked with white flagging tape and their locations recorded using GPS. Concerns about the effects of pending trail maintenance on susceptible species and microhabitats important for bryophytes were discussed with Bruce Duffin after the spring survey (refer to Section 3.0 of the spring report for more details).

Although the uncommon bryophytes documented during the spring and summer surveys are currently ranked by ANHIC as provincially rare, some were frequently encountered throughout the Park and were often locally abundant at the sites they were found. The dung moss *Splachnum sphaericum* was frequently encountered and commonly observed as scattered populations at these locations. The soil-colonizing moss

Atrichum selwynii was also frequently observed throughout the Park and was often found as relatively large, single populations. The moss *Alonia rigida* also colonizes exposed mineral soil and was encountered at two locations during the spring and summer surveys. These species are not likely to be affected by development and maintenance activities in the Park because the microhabitats on which they grow (dung, mineral soil) are very common and/or are not prone to disturbance by maintenance activity (Bruce Duffin, pers. comm.; Caners 2007).

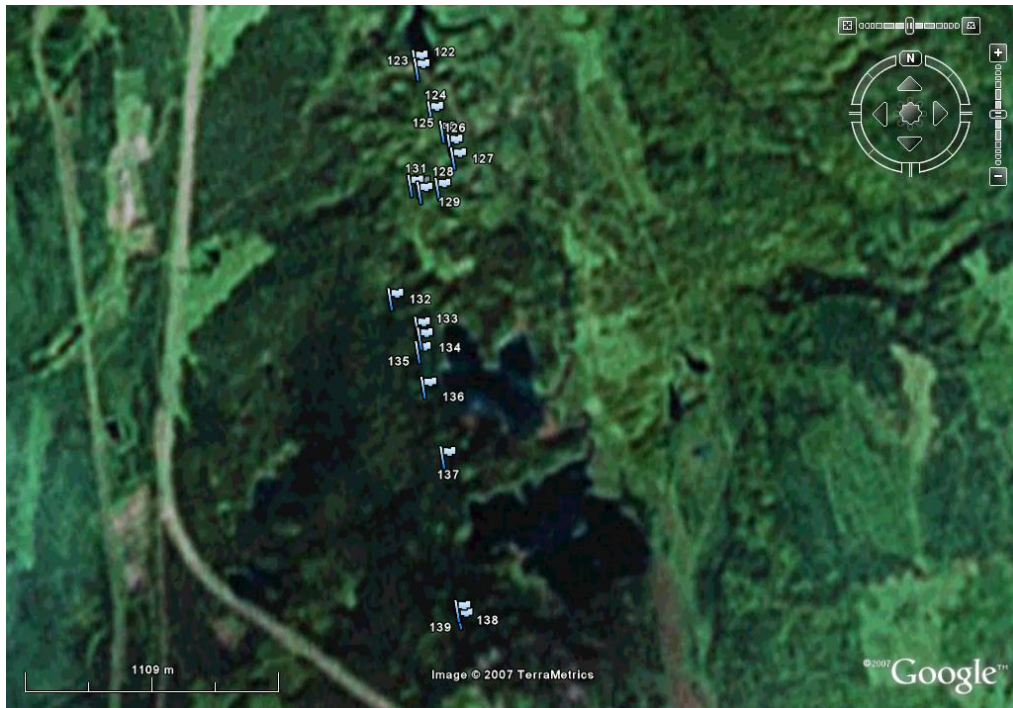
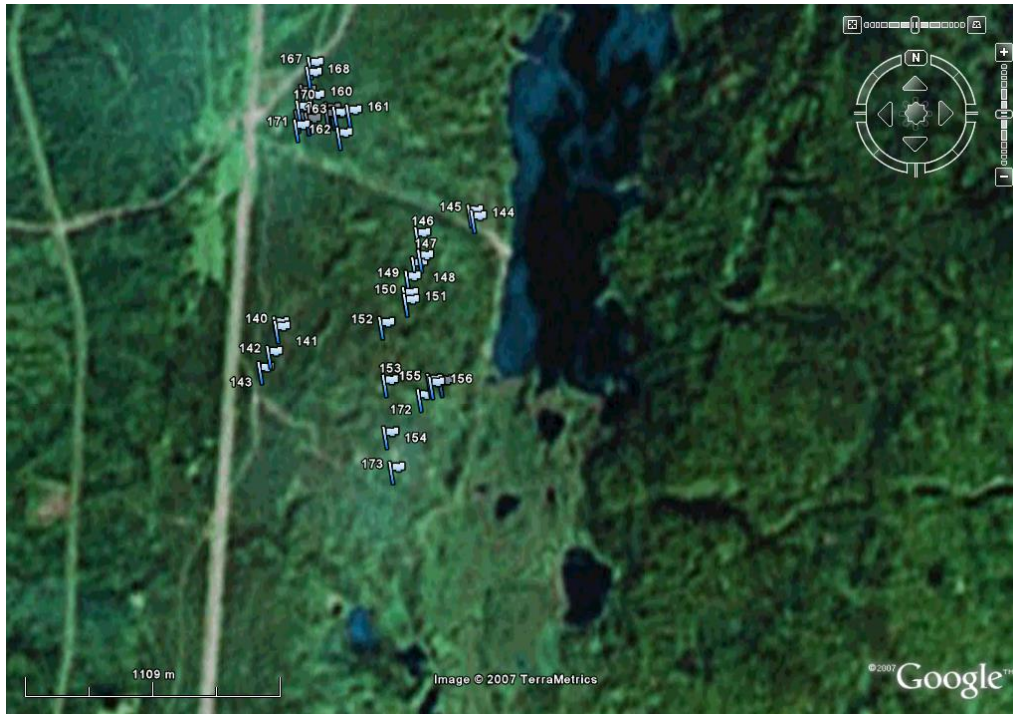
The moss *Hypnum pallescens*, in comparison, was found growing firmly attached to the base of aspen trees at two locations. This species was not frequently encountered in the Park and was not abundant at the sites it was found. If development activity is to occur at these sites, it is recommended that the trees on which the species is growing be left uncut. The species commonly grows in relatively dry habitats (Crum and Anderson 1981) and likely does not require closed forest conditions to persist; therefore, the single tree on which it is found may provide enough habitat for its continued survival. Preferably, small 'islands' of trees can be left uncut where the species is found to moderate the effects of site development on the local microclimate. If the tree on which the species grows needs to be removed for development then extended surveys for the species should first be conducted to determine its abundance in local and extended areas. If the species is found to be locally abundant then site development is less likely to affect its long-term persistence in the Park.

It is also recommended that advice from professional hydrologists and pedologists be obtained before the onset of developments that approach or traverse wetland habitats (e.g., riparian corridors along the proposed Graveyard – Cache Lake trail), slopes, and seepage areas. Wetland sites tend to contain many bryophyte species and may be particularly sensitive to forest clearing and increased recreational use. Moreover, timing of development and maintenance activities should take into consideration the needs of the bird, amphibian, and other incidental wildlife detected during bryophyte surveys.

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Appendix 1 – Location of summer collections at W.A. Switzer Provincial Park



Appendix 1. Location of collections made during the summer survey at W.A. Switzer Provincial Park. Numbers in the figures are the waypoints (‘wpts’) referred to in the body of this report. **Top:** collections made in the Gregg Lake area (Section 2.2). **Bottom:** collections made along the proposed Graveyard – Cache Lake trail (Section 2.1). Please note that not all collection numbers are depicted in the above images (some text is hidden), and that these locations do not represent the full extent of areas surveyed.

Appendix 2 – Photos of surveyed sites and rare species



Photo 1. Mineral soil embankments such as this one along the proposed Graveyard – Cache Lake trail provide important habitat for many bryophyte species.



Photo 2. A treefall mound along the proposed Graveyard – Cache Lake trail. The exposed mineral soil at the base of such mounds is an important microhabitat for bryophytes.



Photo 3. A decayed log along the proposed Graveyard – Cache Lake trail. Logs and stumps in advanced stages of decomposition provide an important substrate for the colonization of bryophyte species.



Photo 4. Dry river channel along the proposed Graveyard – Cache Lake trail. The aquatic moss *Hygrohypnum luridum* grows attached to the rocks on the river bottom.



Photo 5. *Atrichum selwynii* (S2) growing on the exposed mineral soil of a treefall mound along the proposed Graveyard – Cache Lake trail.



Photo 6. This forested site at Gregg Lake is to be cleared for the expansion of the campground at loop A. The site is characterized by an open canopy of lodgepole pine and contains relatively few important microhabitats for bryophytes.



Photo 7. This small forested site at the Gregg Lake campground is to be cleared for the construction of new parking stalls.



Photo 8. Tree bases and well-decayed logs (visible in photo) are the most important microhabitats at this small forested site at Gregg Lake campground, which is to be cleared for the construction of parking stalls.



Photo 9. This forested site is situated across from campsite #9 at the Gregg Lake campground. The most important microhabitats for bryophytes include tree bases, small decayed logs, and small patches of mineral soil at the base of fallen trees.



Photo 10. This forested site at the lakeside Gregg Lake campground is to be cleared for the construction of a new parking lot. There are few important microhabitats for bryophytes at this site and no rare bryophytes were found.



Photo 11. This forested site at the lakeside Gregg Lake campground is to be cleared for the construction of a new parking lot. There are few important microhabitats for bryophytes at this site and no rare bryophytes were found.



Photo 12. Exposed mineral soil along the Gregg Lake trail loop is colonized by generalist species.



Photo 13. Large soil embankments such as this one along the Gregg Lake trail loop provide important habitat for many bryophyte species.



Photo 14. *Atrichum selwynii* (S2) and *Bartramia ithyphylla* (S4) growing in a shaded microsite on the mineral soil embankment depicted in photo 13, above, along the Gregg Lake trail loop.



Photo 15. The dung mosses *Tetraplodon mnioides* (S3) and *T. angustatus* (S3) along the Gregg Lake trail. Another dung moss, *Splachnum sphaericum* (S2), was found nearby.



Photo 16. This small mineral soil embankment along the Gregg Lake trail provides habitat for the rare moss *Aloina rigida* (S2).



Photo 17. A species of *Botrychium* growing adjacent to the Gregg Lake trail.



Photo 18. A species of *Botrychium* growing adjacent to the Gregg Lake trail.



Photo 19. A species of *Botrychium* growing adjacent to the Gregg Lake trail.



Photo 20. A species of *Botrychium* growing adjacent to the Gregg Lake trail.



Photo 21. This site at Gregg Lake is characterized by a relatively open canopy of lodgepole pine, white spruce, and aspen, and is to be cleared for the development of a new group campground. The most important microhabitats at this site are the bases of large trees, patches of forest floor, and animal dung.



Photo 22. This site at Gregg Lake is characterized by a relatively open canopy of lodgepole pine, white spruce, and aspen, and is to be cleared for the development of a new group campground. The most important microhabitats at this site are the bases of large trees, patches of forest floor, and animal dung.



Photo 23. *Hypnum pallescens* (S2) growing at the base of a large aspen tree at the proposed group campground at Gregg Lake.



Photo 24. The emergency exit road adjacent to the proposed group campground (photos 22-23, above) at Gregg Lake. The most important microhabitats for bryophytes are the exposed patches of mineral soil along the edges of the road.



Photo 25. This small forested site at the Gregg Lake campground is to be cleared for the development of new sanitary treatment buildings. The most important microhabitats for bryophytes at this site are tree bases and patches of forest floor.



Photo 26. This forested habitat is to be cleared for the expansion of the Gregg Lake amphitheater. The most important microhabitats at this site are tree bases and patches of forest floor.

Appendix 3 – List of species encountered during the spring and summer surveys at W.A. Switzer Provincial Park³

Taxonomic name⁴

Abietinella abietina
Aloina rigida (currently ranked as S2 by ANHIC)
Ambystegium serpens
*Anastrophyllum helleranum**
Atrichum selwynii (currently ranked as S2 by ANHIC)
Aulacomnium palustre
*Barbilophozia lycopodioides**
Barbula convoluta
Barbula unguiculata
Bartramia ithyphylla
*Blepharostoma trichophyllum**
Brachythecium albicans
Brachythecium campestre
Brachythecium erythorrhizon
Brachythecium salebrosum
Brachythecium starkei
Brachythecium velutinum
Bryum argenteum
Bryum lisae var. *cuspidatum*
Bryum pseudotriquetrum
Campylium hispidulum
Campylium stellatum
Ceratodon purpureus
Climacium dendroides
Dicranella grevilleana
Dicranum flagellare
Dicranum fragilifolium
Dicranum fuscescens
Dicranum polysetum
Dicranum scoparium
Dicranum undulatum
Distichium capillaceum
Enclypta procera
Encalypta rhaptocarpa
Eurhynchium pulchellum
Funaria hygrometrica
Gymnostomum aeruginosum
Hygrohypnum luridum

continued next page...

³ This list includes only those species encountered at a limited number of sites during the spring and summer surveys and is not intended to represent the full complement of species in the Park. Please refer to the final spring (Caners 2007) and summer reports for more information about each of the visited sites.

⁴ The list includes both mosses and liverworts (liverworts indicated with an asterisk,*). Underlined species are currently ranked as provincially rare by ANHIC.

Hylocomium splendens
Hypnum pallescens (currently ranked as S2 by ANHIC)
Hypnum pratense
Isopterygiopsis pulchella
*Jamesoniella autumnalis**
*Lepidozia reptans**
Leptobryum pyriforme
Limprichtia revolvens
*Lophozia ventricosa**
*Marchantia polymorpha**
Mnium spinulosum
Myurella julacea
Oncophorus wahlenbergii
Orthotrichum obtusifolium
Orthotrichum speciosum
*Plagiochila asplenioides**
Plagiomnium cuspidatum
Plagiomnium drummondii
Plagiomnium medium
Plagiothecium laetum
Platydictya jungermanniioides
Pleurozium schreberi
Pohlia cruda
Pohlia nutans
Pohlia prolifera
Pohlia wahlenbergii
Polytrichum commune
Polytrichum juniperinum
Polytrichum piliferum
Polytrichum strictum
Pseudoleskeella tectorum
*Ptilidium ciliare**
*Ptilidium pulcherrimum**
Ptilium crista-castrensis
Pylaisiella polyantha
Rhytidiadelphus triquetrus
Rhytidiopsis robusta
Sanionia uncinata
Schistidium apocarpum
Splachnum sphaericum (currently ranked as S2 by ANHIC)
Tetraphis pellucida
Tetraplodon angustatus
Tetraplodon mnioides
Thuidium recognitum
Timmia austriaca
Tortella fragilis
Tortella tortuosa
Tortula mucronifolia
Tortula ruralis
*Tritomaria exsectiformis**

Appendix 4 – ANHIC rare plant survey forms⁵



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Information from these rare plant survey forms is available by request from:

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⁵ These forms were submitted to ANHIC on October 24, 2007, as part of this report.