

REPORT

Pigeon Lake Provincial Park Rare Lichen Survey, October 14-18, 2008



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Pigeon Lake Provincial Park Rare Lichen Survey, October 14-18, 2008

A rare lichen survey was conducted in selected areas of Pigeon Lake Provincial Park (PLPP) from October 14 to 18, 2008. The main objective of the survey was to document the occurrence of rare lichens and mitigate possible damage as a result of infrastructure upgrade activities, including the expansion of old camp stalls, creation of new camp stalls, shower buildings, a new boat launch and some additional tree and shrub clearings. The park is located approximately 25 km west of Wetaskiwin, Alberta and is accessed by Hwy 13. It falls within the Central Parkland, a subregion of the Parkland Natural Region of Alberta, characterized by aspen (*Populus tremuloides*) and balsam poplar (*Populus balsamifera*) stands (Kershaw et al. 2001). These stands form the main vegetation community of PLPP (Kershaw et al. 2001) and are typically known for not supporting high lichen numbers as it is often too dry.

Methodology

The rare lichen survey followed the Guidelines for Rare Plant Surveys that was developed by the Alberta Native Plant Council (ANPC 2000). Prior to fieldwork, a check with the Alberta Natural Heritage Information Centre (ANHIC 2008), reported no lichen element occurrences in the park or in a 15 km radius of PLPP. The rare lichen survey was comprised of two campsite loop areas (loops A to E and G to J – loop F was excluded from this study, as it has been upgraded in the past) and day use area in the main area of PLPP (Appendix 1) and a survey of the beach campground and campsite loop A at the smaller Zeiner Campground, 6 km north of the main area (Appendix 2).

The fieldwork survey used a meander search through the selected areas of PLPP (ANPC 2000); this involved searching microhabitats such as tree bases, logs, moist sites, all tree species and any other interesting niches. Lichens noted while meandering through the areas were recorded in a field notebook. Information such as UTM coordinates, population and extent of any rare or tracked lichen found were also recorded.

Collections of rare lichens were made when their population sizes and numbers were large enough to warrant collection and if a specimen was needed for identification purposes. Occasional collections of common lichens were also made to provide an introductory list of lichens for PLPP. Lichen specimens are to be deposited at the Royal Alberta Museum. Taxonomic keys used for species identification included Brodo et al. (2001), Nash III et al. (2002, 2004, 2007), Goward et al. (1995) and Goward (1999). Nomenclature for all lichens in the report follows Esslinger (2008).

Results

The lichens, *Ramalina sinensis* and *Xanthoria fulva*, both found on balsam poplar, were the only tracked lichens found in the surveyed areas of PLPP (Appendix 3). *Ramalina sinensis* Jatta is ranked* as SU, status unrankable, more information needed. Recently Scott LaGreca, a *Ramalina* specialist, annotated many Alberta collections as *R. sinensis* from Alberta. These specimens will be observed when accessioned by PMAE (Royal Alberta Museum). I have found *R. sinensis* in several locations throughout the province.

Xanthoria fulva (Hoffm.) Poelt & Petutschnig was brought to the attention of North American lichen enthusiasts when Lindblom (1997) published her doctoral research on *Xanthoria* in North America. This lichen has orange pimples that are pycnidia on the lichen surface. *Xanthoria fulva* is not rare in North America being well represented in central USA on the dot map and with 8 dots for Alberta (Lindblom 1997). Although it does not appear on the Preliminary Lichen Tracking List (Gould 2000), it has been listed by ANHIC as S1 since March 2000 (Ksenija Vujnovic, personal communications). Rare Native Plant and Lichen Survey Forms for these two species have been deposited with the Alberta Natural Heritage Information Centre. Information from these survey forms is available by request from:

Todd Kemper, ANHIC Senior Botanist
Email: Todd.Kemper@gov.ab.ca
Tel: 780-644-2747.

A total of 45 lichens were observed on trees, logs, ground and rock (Appendix 4).

***Conservation status ranks:**

The “ranks” define species conservation status in Alberta (state/provincial rank, S) and are based on criteria developed by NatureServe (NatureServe 2008). Element (including lichen) ranks in Alberta are based primarily on the number of occurrences in the province, although information on population size and trends, life history and reproductive strategies, range, and threats is used when available (Gould 2000). The provincial status ranks referred to in this report are defined as follows:

S1: <5 occurrences or only a few remaining individuals;
SU (Unrankable) —Currently unrankable due to lack of information or due to substantially conflicting information about status or trends

Notes on sites surveyed in Pigeon Lake Provincial Park

Loops A,B,C,D,E

This area is open agronomic fields with stands of aspen-poplar/willow/rose scattered throughout. Lichens occurred on aspen, poplar, birch (*Betula* sp.), willow (*Salix* spp.) rock and logs. Interesting lichens found in this area include *Caloplaca cerina*, grey-rimmed firedot lichen, common on poplar and aspen bark in open woodlands and on isolated trees, *Flavopunctelia flaventior*, speckled greenshield, a species of eastern Canada that is at its western edge in the Pigeon Lake area, and *Melanelia albertana*, powder-rimmed camouflage lichen, also at the western edge of its range that goes east across the prairies to Ontario.

Loops G,H, I, J and new shower building location and parking lot

Proposed loops G to J are located in woodland communities with dominant trees that include aspen, poplar, white spruce (*Picea glauca*), birch, willow and alder (*Alnus* sp.). Common understory plants include prickly rose (*Rosa acicularis*), cow parsnip (*Heracleum lanatum*), bluejoint (*Calamagrostis canadensis*) and common horsetail (*Equisetum arvense*) in wetter areas. *Ramalina sinensis* was found on poplar bark along the path from old loop C (camp stall 38 – north part of the proposed loop G) to the old shower buildings (contact ANHIC for more detailed information). Other lichens on this tree include *Evernia mesomorpha*, *Usnea substerilis*, *Lecanora impudens*, *Physcia adscendens*, *Parmelia sulcata*, *Phaeophyscia orbicularis*, *Physconia detersa*, *Xanthoria fallax* and *Physcia aipolia*; this tree had the greatest compliment of lichen species that I observed.

Proposed Loop J was richer in lichens as it appeared to have a wetter moisture regime than the other loops in this group. Alder was prevalent at this loop as well as many large based willows. Lichens on willow indicative of greater soil moisture and thereby lichen growing potential include *Hypogymnia physodes*, *Flavopunctelia flaventior*, *Melanelia subaurifera* and *Usnea hirta*.

Day Use Areas

The Day Use Area had fewer lichens on trees than in the campground areas, possibly due to drying winds moving up and down the lake; trees with lichens included poplar, aspen, willow and alder. White spruce and birch did not support many lichens (Appendix 3). More lichens were observed in the area of the new boat launch than in the other Day Use Area.

Zeiner Campground – Beach campground periphery and vicinity of old shower building

Trees that supported lichens in this area were alder, aspen, birch, poplar, spruce and willow; plants in the understory included dewberry (*Rubus pubescens*), common Labrador tea (*Ledum groenlandicum*) and cow parsnip. Lichens were most abundant at the north or creek end of the campground; here bright yellow-orange *Candelaria concolor* grows profusely around white spruce twigs, possibly due to bird guano input. Other forest lichen indicators of a healthy site were found on spruce (i.e., brown *Bryoria fuscescens*, pale-footed horsehair lichen, the beard lichens, *Usnea hirta*, *U. lapponica* and *U. substerilis*) and, on aspen (*Catillaria glauconigricans*, a crust lichen that is powdery white with black dot apothecia on the tree trunk bark).

Zeiner, Loop A

This loop (triangle) was surveyed clockwise from the road immediately north of Loop B, by turning west/southwest, then turning north/northeast, and finally turning southeast to the road. One poplar in a group of 3 or 4 trees between campsites 1 and 2 at the first west traveling road was rich in lichens with species such as foliose or leaf-like *Physconia detersa*, *Melanelia albertana*, *Xanthoria fallax* and fruticose or shrub-like *Usnea substerilis* and *Evernia mesomorpha*. Also, when collections from this tree were checked in the lab, orange *Xanthoria fulva* was found. Refer to Appendix 3 for the full list of lichens of Loop A.

Recommendations

At present, *Ramalina sinensis* has an uncertain status and *Xanthoria fulva* is ranked S1 by ANHIC. These lichens are not truly rare, but are not common in Alberta either, so should be preserved if possible and especially their habitats on the nutrient enriched bark of some poplar. Although the only thallus of *Xanthoria fulva* found during this study was removed from the tree for identification purposes, there is a chance that additional thalli may exist further up on the tree where the tree height prevented proper surveying for this species. Also, this particular poplar tree supports a high diversity of lichens for this site and therefore should be protected from future disturbances.

References

- Alberta Natural Heritage Information Centre (ANHIC). 2008. Database query (accessed September 2008).
- Alberta Native Plant Council. 2000. ANPC Guidelines for Rare Plant Surveys in Alberta. Information Bulletin, March 2000.
- Brodo, I. M., S. D. Sharnoff, and S. Sharnoff. 2001. Lichens of North America. Yale University Press, New Haven & London. 795 pp
- Esslinger, T. L. 2008. A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. North Dakota State University:
<http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.htm>
- Gould, J. 2000. Alberta Natural Heritage Information Centre Preliminary Lichen Tracking List, Alberta Environment, Edmonton, Alberta.
- Goward, T. 1999. The Lichens of British Columbia, Illustrated Keys. Part 2, Fruticose Species. - British Columbia Ministry of Forests, Victoria. 319 pp.
- Goward, T., B. Goffinet, and O. Vitikainen. 1995 Synopsis of the genus *Peltigera* (lichenized Ascomycetes) in British Columbia, with a key to the North American species. Canadian Journal of Botany **73(1)**: 91-111
- Kershaw L., J. Gould, D. Johnson, and J. Lancaster (eds.). 2001. Rare Vascular Plants of Alberta. University of Alberta Press, Edmonton. 438 pp
- Lindblom L. 1997. The genus *Xanthoria* (Fr.) Th.Fr. in North America. J. Hattori Bot. Lan. No. 83: 75-172.
- Nash III, T. H., B. D. Ryan, C. Gries, and F. Bungartz (eds.). 2002 Lichen Flora of the Greater Sonoran Desert Region, Vol. I. Lichens Unlimited, Arizona State University, Tempe, Arizona. 532 pp
- Nash III, T. H., B. D. Ryan, P. Diederich, C. Gries, and F. Bungartz (eds.) 2004 Lichen Flora of the Greater Sonoran Desert Region, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona. 776 pp
- Nash III, T. H., C. Gries, and F. Bungartz (eds.) 2007 Lichen Flora of the Greater Sonoran Desert Region, Vol. 3. Lichens Unlimited, Arizona State University, Tempe, Arizona. 567 pp

NatureServe. 2008. NatureServe conservation status. NatureServe Central Databases. Available at:

<http://www.natureserve.org/explorer/ranking.htm#natsub>

Vujnovic, K. [personal communications] - Park Ecologist, East Central Area, Parks Division, Alberta Tourism, Parks and Recreation, Alberta government; 3rd Floor, 9820 106 Street, Edmonton, AB, T5K 2J6 (780-644-7688)

Appendix 1. Map of proposed campground upgrades in Pigeon Lake PP (modified from the preliminary (50%) concept, submitted to Parks Division by *ISL Engineering and Land Services Ltd.* on August 2008). Yellow coloured area around loops A to E marks an open agronomic field (excluded from this survey).



Appendix 2. Map of proposed campground upgrades in Zeiner Campground (modified from the preliminary (50%) concept, submitted to Parks Division by *ISL Engineering and Land Services Ltd.* on August 2008)



Appendix 3. List of lichens on different substrates in selected areas of PLPP
(October 14-18, 2008)

Loops A,B,C,D,E

on Aspen	<i>Caloplaca cerina</i> <i>Caloplaca holocarpa</i> <i>Candelariella aurella</i> <i>Lecanora impudens</i> <i>Lecanora symmicta</i> <i>Melanelia albertana</i> <i>Phaeophyscia hispidula</i> <i>Phaeophyscia orbicularis</i> <i>Physcia adscendens</i> <i>Physcia aipolia</i> <i>Physcia stellaris</i> <i>Usnea lapponica</i> <i>Xanthoria fallax</i>
on Birch	<i>Parmelia sulcata</i> <i>Physcia adscendens</i> <i>Physcia aipolia</i> <i>Usnea substerilis</i>
on Poplar	<i>Caloplaca holocarpa</i> <i>Evernia mesomorpha</i> <i>Parmelia sulcata</i> <i>Phaeophyscia orbicularis</i> <i>Physcia adscendens</i> <i>Physcia aipolia</i> <i>Xanthoria candelaria</i> <i>Xanthoria fallax</i>
on Willow	<i>Flavopunctelia flaventior</i> <i>Lecanora symmicta</i> <i>Melanelia subolivacea</i> <i>Parmelia sulcata</i> <i>Phaeophyscia orbicularis</i> <i>Physcia adscendens</i> <i>Physcia aipolia</i> <i>Physcia stellaris</i> <i>Usnea lapponica</i> <i>Usnea substerilis</i> <i>Xanthoria fallax</i>
on ground/log	<i>Cladonia coniocraea</i> <i>Parmelia sulcata</i> <i>Peltigera canina</i> <i>Cladonia fimbriata</i>

Loops G, H, I, J

(includes associated roads and new shower bldg
and parking lot)

on Aspen and
Poplar

Amandinea punctata
Caloplaca cerina
Caloplaca holocarpa
Caloplaca holocarpa
Candelariella aurella
Catillaria glauconigricans
Evernia mesomorpha
Flavopunctelia flaventior
Lecanora impudens
Lecanora symmicta
Melanelia albertana
Melanelia subaurifera
Parmelia sulcata
Phaeophyscia orbicularis
Physcia adscendens
Physcia aipolia
Physcia aipolia
Physconia detersa
Ramalina sinensis
Usnea lapponica
Usnea substerilis
Xanthoria candelaria
Xanthoria fallax

SU

on Birch

Evernia mesomorpha
Parmelia sulcata
Physcia aipolia
Usnea substerilis

on White Spruce

Caloplaca holocarpa
Candelariella aurella
Parmelia sulcata
Phaeophyscia orbicularis
Physcia adscendens
Physcia aipolia
Usnea substerilis

on Willow

Candelariella aurella
Evernia mesomorpha
Flavopunctelia flaventior
Hypogymnia physodes
Lecanora impudens
Melanelia subaurifera

Parmelia sulcata
Phaeophyscia orbicularis
Physcia adscendens
Physcia aipolia
Usnea hirta
Usnea lapponica
Usnea substerilis
Xanthoria fallax

on Alder

Lecanora symmicta
Parmelia sulcata
Physcia adscendens
Physcia aipolia

on ground/log

Candelariella aurella
Hypogymnia physodes
Parmelia sulcata
Parmeliopsis ambigua
Peltigera canina
Peltigera neckeri
Peltigera retifoveata
Peltigera rufescens

DAY USE AREA

on Poplar/Aspen

Xanthoria fallax
Parmelia sulcata
Physcia aipolia
Lecanora impudens
Physcia adscendens
Melanelia albertana
Phaeophyscia hispidula
Phaeophyscia orbicularis
Physcia aipolia

on Willow

Physcia aipolia
Parmelia sulcata
Physcia adscendens

on Alder

Parmelia sulcata
Xanthoria fallax
Physcia adscendens
Phaeophyscia orbicularis

ZEINER

(periphery of beach campground and area of old shower building)

on Alder

Evernia mesomorpha
Lecanora symmicta

	<i>Melanelia elegantula</i> <i>Melanelia subaurifera</i> <i>Parmelia sulcata</i> <i>Physcia adscendens</i> <i>Usnea lapponica</i>
on Birch	<i>Candelaria concolor</i> <i>Evernia mesomorpha</i> <i>Melanelia sp</i> <i>Parmelia sulcata</i>
on Aspen	<i>Caloplaca cerina</i> <i>Catillaria glauconigricans</i> <i>Physcia adscendens</i>
on Poplar	<i>Caloplaca holocarpa</i> <i>Evernia mesomorpha</i> <i>Flavopunctelia flaventior</i> <i>Lecanora symmicta</i> <i>Melanelia exasperatula</i> <i>Melanelia subaurifera</i> <i>Melanelia subolivacea</i> <i>Parmelia sulcata</i> <i>Phaeophyscia orbicularis</i> <i>Physcia adscendens</i> <i>Physcia aipolia</i> <i>Usnea lapponica</i> <i>Usnea substerilis</i> <i>Xanthoria fallax</i>
on White Spruce	<i>Bryoria fuscescens</i> <i>Candelaria concolor</i> <i>Evernia mesomorpha</i> <i>Parmelia sulcata</i> <i>Physcia adscendens</i> <i>Physcia aipolia</i> <i>Usnea hirta</i> <i>Usnea lapponica</i> <i>Usnea substerilis</i> <i>Xanthoria candelaria</i>
on Willow	<i>Candelariella aurella</i> <i>Lecanora impudens</i> <i>Melanelia septentrionalis</i> <i>Parmelia sulcata</i> <i>Phaeophyscia orbicularis</i> <i>Physcia adscendens</i> <i>Physcia aipolia</i> <i>Usnea substerilis</i>

	<i>Xanthoria fallax</i>	
on ground/log	<i>Cladonia cenotea</i> <i>Cladonia chlorophaea</i> <i>Cladonia coniocraea</i> <i>Cladonia multiformis</i> <i>Vulpicida pinastri</i>	
ZEINER (LOOP A)		
on Poplar	<i>Evernia mesomorpha</i> <i>Lecanora impudens</i> <i>Melanelia albertana</i> <i>Parmelia sulcata</i> <i>Peltigera praetextata</i> <i>Phaeophyscia orbicularis</i> <i>Physcia adscendens</i> <i>Physconia detersa</i> <i>Usnea lapponica</i> <i>Usnea substerilis</i> <i>Xanthoria fallax</i> <i>Xanthoria fulva</i>	at base S1
on White Spruce	<i>Parmelia sulcata</i> <i>Physcia adscendens</i> <i>Physcia aipolia</i>	
on Aspen	<i>Lecanora impudens</i> <i>Phaeophyscia orbicularis</i> <i>Physcia adscendens</i>	
on Willow	<i>Phaeophyscia orbicularis</i> <i>Physcia adscendens</i>	

Appendix 4. List of lichens found in selected areas of Pigeon Lake Provincial Park.

<i>Amandinea punctata</i>	
<i>Bryoria fuscescens</i>	
<i>Caloplaca cerina</i>	
<i>Caloplaca holocarpa</i>	
<i>Candelaria concolor</i>	
<i>Candelariella aurella</i>	
<i>Catillaria glauconigricans</i>	
<i>Cladonia cenotea</i>	
<i>Cladonia chlorophaea</i>	
<i>Cladonia coniocraea</i>	
<i>Cladonia fimbriata</i>	
<i>Cladonia multiformis</i>	
<i>Evernia mesomorpha</i>	
<i>Flavopunctelia flaventior</i>	
<i>Hypogymnia physodes</i>	
<i>Lecanora impudens</i>	
<i>Lecanora impudens</i>	
<i>Lecanora symmicta</i>	
<i>Melanelia albertana</i>	
<i>Melanelia elegantula</i>	
<i>Melanelia exasperatula</i>	
<i>Melanelia septentrionalis</i>	
<i>Melanelia sp</i>	
<i>Melanelia subaurifera</i>	
<i>Parmelia sulcata</i>	
<i>Parmeliopsis ambigua</i>	
<i>Peltigera canina</i>	
<i>Peltigera neckeri</i>	
<i>Peltigera praetextata</i>	
<i>Peltigera retifoveata</i>	
<i>Peltigera rufescens</i>	
<i>Phaeophyscia hispidula</i>	
<i>Phaeophyscia orbicularis</i>	
<i>Physcia adscendens</i>	
<i>Physcia aipolia</i>	
<i>Physcia stellaris</i>	
<i>Physconia detersa</i>	
<i>Ramalina sinensis</i>	SU
<i>Usnea hirta</i>	
<i>Usnea lapponica</i>	
<i>Usnea substerilis</i>	
<i>Vulpicida pinastri</i>	
<i>Xanthoria candelaria</i>	
<i>Xanthoria fallax</i>	
<i>Xanthoria fulva</i>	S1