

Small Patch Communities of La Butte Creek Wildland Provincial Park
Lorna Allen, J. Derek Johnson, Ksenija Vujnovic



2002

A report prepared for Parks and Protected Areas, Alberta Community Development, Edmonton, Alberta.

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Introduction

In July 2001 La Butte Creek Wildland Provincial Park (LBCWPP) was surveyed to document small patch plant communities. Small patch plant communities add considerably to the diversity of a site, harbouring flora and potentially fauna dependent on these specialized habitats¹. They are however often overlooked in vegetation studies because they are not extensive or common enough to be considered representative. The focus of this study was to look within the matrix of the representative plant communities (surveyed and documented by the Ecological Land Classification team) to find and document the small patch communities that may be significant in a provincial context. This work was also significant as there were no previous studies documenting vegetation of this remote area.

LBCWPP is located in the northeast corner of Alberta, a remote site accessible in summer only by air or water. The character of the site changes significantly from west to east, as it straddles two natural subregions, the Peace River Lowlands (Boreal Forest Natural Region) and the Kazan Uplands (Canadian Shield Natural Region) (Figure 1).

The Slave River forms the western boundary of the Wildland Provincial Park and in this area the landscape is composed predominantly of marshy lowlands, meander scars and forested river terraces. These have formed on the deposits of the Slave River and are connected with the vast delta deposits of the Athabasca, Peace and Birch rivers that make up the Peace River Lowlands Natural Subregion.

LBCWPP is on the western edge of the Canadian Shield, an extensive region that stretches across Canada. Rounded, granite outliers of Precambrian Shield rocks occur sporadically along the Slave River. Moving east, the outcrops become increasingly more common until areas of bedrock outcrops become the predominate landform. Small areas of wet depressions are trapped between the rock outcrops.

Methods

The focus of this work was to collect information on small patch communities in the La Butte Creek Wildland Provincial Park. Although the information presented here will supplement the information on representative vegetation being collected by the Ecological Land Classification team, emphasis was placed on documenting communities that may be significant in a provincial context.

A literature review was done for sites with similarities to the Wildland Provincial Park, including sites in northern Alberta, northwestern Saskatchewan and the nearby Northwest Territories. Plant communities or habitats that have been documented as unusual in any way were noted as community types of interest that potentially occur within the Wildland Provincial Park. Wherever possible these community types of interest were linked to landscapes that could be picked out on aerial photographs. The types of interest and target landscapes are listed in Appendix 1.

The Alberta Natural Heritage Information Centre Preliminary Plant Community Tracking List² (TL) is a compilation of plant communities thought to be of restricted distribution in the province. Types known to occur in the Canadian Shield or Boreal Forest natural regions were linked to a landscape, and are listed in Appendix 2.

In total, 24 unusual communities or habitats were identified as potentially occurring within the study area and linked to landscapes (Appendices 1 and 2). Aerial photographs for the Wildland Provincial Park were then reviewed and all landscapes with potential to include these unusual communities or habitats were marked as target areas. In addition, habitats that looked different or might include some unusual communities were also targeted. These included areas such as north or south facing cliffs or sites with unusual patterning.

As many target areas as possible were visited during the field program (July 5-16, 2001). More accessible sites were reached by foot or by boat. A few sites were approached by helicopter. At least one location of each of the target areas chosen through the preliminary air-photo investigation was surveyed.

Slow moving Shield streams similar to La Butte Creek are not common in Alberta, with Wallis and Wershler³ only noting four (La Butte Creek, Ryan Creek, Bocquene River and Dog River). So some work was also done to document the aquatic and shoreline communities of the accessible portions of La Butte Creek.

When a plant community that might be unusual was encountered, a vegetation plot was subjectively placed in a homogeneous location. Site data and floristic composition were documented and the percent cover of each species visually estimated. General locations of detailed vegetation plots are marked on Figure 1. Plot sizes were chosen appropriate to the physiognomy of the vegetation. They are as follows:

- 20 X 20 m for cover values of tree species in forested stands
- 10 X 10 m for shrublands and for understory estimates in forested stands
- 5 X 5 m for dwarf shrublands or grasslands

It was necessary to alter plot shape and size to sample the narrow, linear aquatic and wet meadow communities (plots 2 X 5 m and 2 X 3 m, respectively, were used).

Specimens of difficult taxonomic groups or of unknown species were collected and identified in the camp or pressed for later identification. Scientific names for the most part follow Moss⁴, but have been updated to be consistent with the taxonomy used by the Alberta Natural Heritage Information Centre. When taxonomy other than Moss is used, the name found in Moss⁴ is included in parenthesis in the discussion of the community type (CT). Common names follow Ealey⁵.

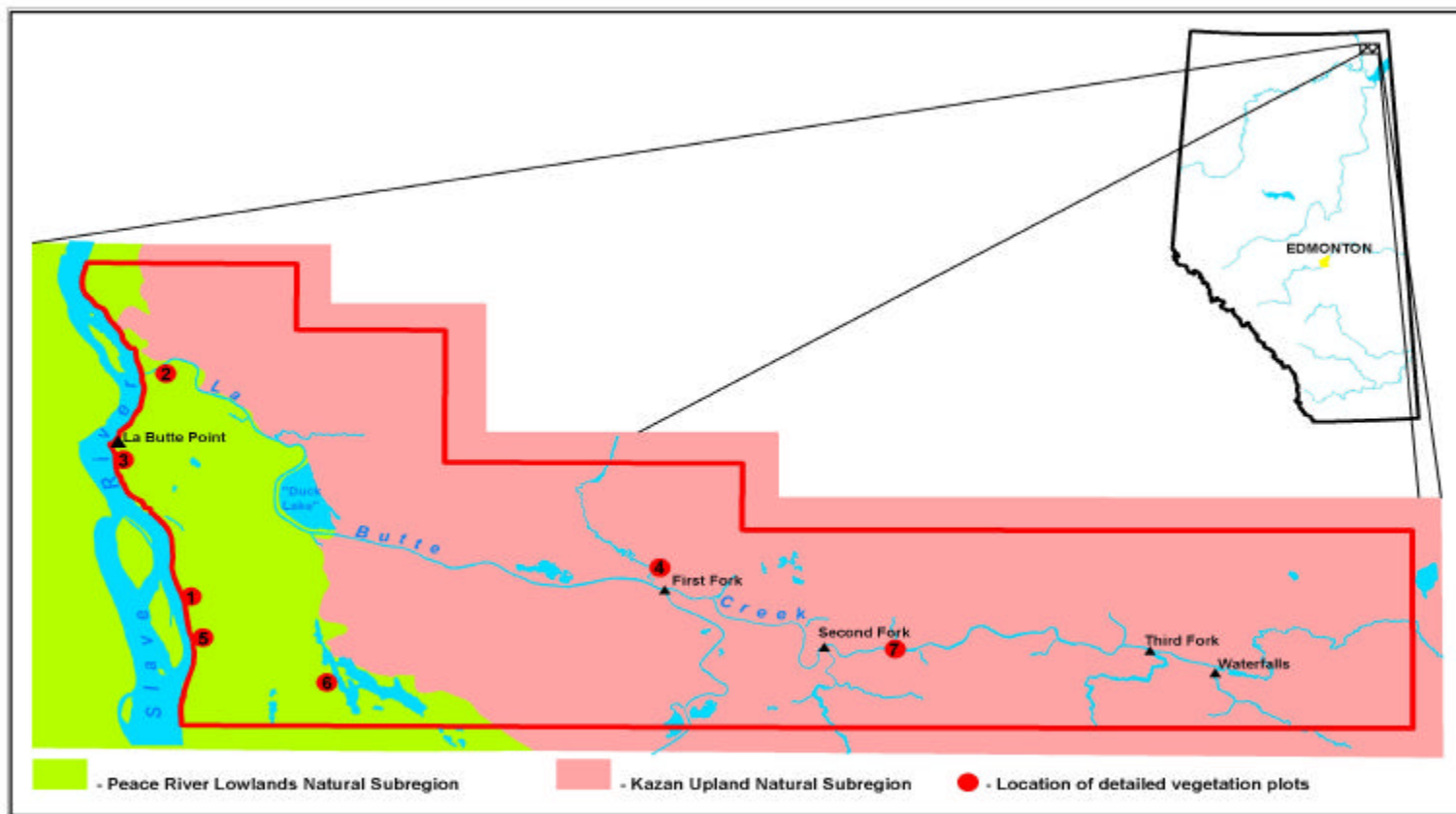


Figure 1. La Butte Creek Wildland Provincial Park:
Location, Subregions and Community Type (CT) Plot Locations

Results

Table 1 summarizes the targeted landscapes that the literature suggested may include some unusual community types and that the aerial photograph review suggested might reasonably be expected to occur in LBCWPP. Landscapes that might be expected to occur, but were not located during the aerial photograph review or field program, are also listed. Some of the landscapes listed in Appendix 2 are not included in this section, as they do not occur in LBCWPP (e.g. open sand dune habitats). If a community type (CT) was located that was considered potentially significant, it is noted in the observations column and documented in further detail in the following section.

Table 1. Target Landscapes	
Target Landscapes	Observations
Uplands	
Open graminoid slopes	No sites located on aerial photographs
Graminoid openings	Two sites visited and documented (CT3. <i>Arctostaphylos uva-ursi</i> / <i>Elymus trachycaulus</i> (<i>Agropyron trachycaulum</i>) dwarf shrubland and CT4. <i>Arctostaphylos uva-ursi</i> / <i>Oryzopsis pungens</i> / <i>Cladina mitis</i> dwarf shrubland)
Shrubby forest openings	No sites located on aerial photographs
Aspen stands	Several stands visited, one unusual type documented (CT2. <i>Populus tremuloides</i> / <i>Rosa acicularis</i> / <i>Apocynum androsaemifolium</i> forest)
Open pine stands	No sites located on aerial photographs
Spruce stands	Stands visited, no unusual types noted
Riparian areas	
Deciduous stands	Stands visited, one TL type noted (CT1. <i>Populus balsamifera</i> / <i>Alnus tenuifolia</i> / <i>Cornus stolonifera</i> / <i>Equisetum pratense</i> forest)
Shrublands	Stands visited, no unusual types noted
Wetlands	
Saline seepage	No sites located on aerial photographs
Beaver ponds	Stands visited, no unusual types noted
Larix fen	No sites located on aerial photographs
Patterned fen	No sites located on aerial photographs
Shrubby fen	Stands visited, no unusual types noted
Small pond of open water	Sites visited and one TL type documented (CT5. <i>Calla palustris</i> – <i>Carex pseudocyperus</i> wet meadow)
Other targets	
North-facing cliffs	Sites visited, unusual moss species noted but more work needed to determine CT
South –facing cliffs	Sites visited, no unusual types noted
Areas of unusual patterning	Sites visited and one type documented (CT6. saline meadow complex)
Aquatic communities	One stand documented (CT7. <i>Glyceria borealis</i> - <i>Sium suave</i> - <i>Sparganium angustifolium</i> floating-leaved aquatic community)

Most landscape types visited did not support plant communities that were considered unusual. Although in some cases they were a restricted community within the Wildland Provincial Park, they were similar to more widespread types outside the Park, and so were not documented in detail.

Those plant communities located that were potentially significant in a provincial context were documented through plots and are listed in the following section. Other types were just noted and are listed in Appendix 3.

Plant Communities Documented

Seven plant community types of potential provincial significance were documented in detail. The general locations of the plots are given in Figure 1 and listed beside each type. The types documented include:

- two forest/woodland community types (CT)
 - CT1. *Populus balsamifera* / *Alnus tenuifolia* - *Cornus stolonifera* / *Equisetum pratense* forest
Balsam poplar / river alder - red-osier dogwood / meadow horsetail forest
 - CT2. *Populus tremuloides* / *Rosa acicularis* / *Apocynum androsaemifolium* forest
Aspen / prickly rose / spreading dogbane forest
- two dwarf shrublands
 - CT3. *Arctostaphylos uva-ursi* / *Elymus trachycaulus* (*Agropyron trachycaulum*) dwarf shrubland
Common bearberry / slender wheat grass dwarf shrubland
 - CT4. *Arctostaphylos uva-ursi* / *Oryzopsis pungens* / *Cladina mitis* dwarf shrubland
Common bearberry / northern rice grass / reindeer lichen dwarf shrubland
- two herbaceous communities
 - CT5. *Carex pseudocyperus* - *Calla palustris* wet meadow
Cyperus-like sedge – water arum wet meadow
 - CT6. Saline meadow complex
- and one aquatic community
 - CT7. *Glyceria borealis* - *Sium suave* - *Sparganium angustifolium* floating-leaved aquatic community
Northern manna grass - water parsnip - narrow-leaved bur-reed floating-leaved aquatic community

For each of these, detailed plot data are presented, followed by a discussion, evaluation of the community's significance, and brief recommendations.

CT1. *Populus balsamifera* / *Alnus tenuifolia* - *Cornus stolonifera* / *Equisetum pratense* forest
Balsam poplar / river alder / red-osier dogwood / meadow horsetail forest

Location

La Butte Creek Wildland Provincial Park

UTM 12V 475700 Easting 6581475 Northing (NAD 83)

Site Description

This old growth balsam poplar stand covers about 10 ha and was found on a high alluvial terrace adjacent to the Slave River (Figure 1). Flooding would be expected to be infrequent due to the height of the terrace above the current river level. This was a mesic, closed stand made up primarily of large, old trees, with up to 50 cm DBH and a well-developed shrub layer. There was a high cover (90%) of leaf litter, and a generally sparse herb layer, although meadow horsetail forms dense patches in some areas. There were also numerous downed logs.



photo by L. Allen

Comments

This was the best-developed riparian poplar stand noted in the park.

Plot: 20 X 20 m

Date: July 11, 2001

Species		Cover (%)
Scientific	Common	
Tree Canopy		
<i>Populus balsamifera</i>	Balsam poplar	50
Tall Shrubs		
<i>Alnus tenuifolia</i> (ht. 3 m)	River alder	20
<i>Cornus stolonifera</i> (ht. 2 m)	Red-osier dogwood	20
Low Shrubs (average ht. of layer in the stand, 50 cm)		
<i>Populus balsamifera</i>	Balsam poplar	1
<i>Rosa acicularis</i>	Prickly rose	5
<i>Rubus idaeus</i>	Wild red raspberry	1
<i>Viburnum edule</i>	Low-bush cranberry	2
Forbs / Dwarf shrubs		
<i>Epilobium angustifolium</i>	Common fireweed	1
<i>Equisetum pratense</i>	Meadow horsetail	5
<i>Pyrola asarifolia</i>	Common pink wintergreen	10
<i>Rubus pubescens</i>	Dewberry	10

Discussion

Old-growth stands are generally uncommon in the area, perhaps due to the frequency of fires in boreal landscapes. This stand had the best-developed lichen community on the bark of the deciduous trees of any that were visited in LBCWPP. Lichens in the family *Physciaceae* were particularly well represented.

Significance

This CT is recognized as a rare plant community in Alberta, and is currently ranked S3². In addition, the northernmost occurrence of *Melanella albertana* (a parkland-and dry mixed-wood boreal specialist) in AB (and probably the world) was noted. The entire length of the Slave River within LBCWPP was surveyed and this CT was only found in the one area.

Recommendation

This community should be recognized as a special feature of provincial significance.



Figure 2. CT1 Occurrence location

CT2. *Populus tremuloides* / *Rosa acicularis* / *Apocynum androsaemifolium* forest
 Aspen / prickly rose / spreading dogbane forest

Location

La Butte Creek Wildland Provincial Park
 Plot 1: UTM 12V 474974.72 Easting 6586900.80 Northing (NAD 83)
 Plot 2: UTM 12V 474878 Easting 6586902 Northing (NAD 83)

Site Description

Maturing aspen stand about 5 ha in size on a gently sloping (about 5%), fluvial terrace about 10 m above the creek level (Figure 1). Two plots were done in the stand: plot 1 on a southwest-facing slope, and plot 2 on a southeast-facing slope. This is a mesic, well to moderately well drained site on a sandy substrate.

Comments

The stand is composed of tall, straight aspen with good understory development. A sparse understory tree layer (about 1% cover, about 10 m tall) of aspen and beaked willow was present in the first plot.

Plot: 20 X 20 m

Surveyors: Plot 1 – L. Allen, K. Vujnovic, E. Flynn, July 14, 2002

Plot 2 – C. Jedrzycki

Species		Cover (%)	
Scientific	Common	Plot 1	Plot 2
Tree Canopy (ht. 20 m)			
<i>Populus tremuloides</i>	Aspen	70	75
<i>Populus balsamifera</i>	Balsam poplar	-	5
Understory Tree Layer (ht. 10m)			
<i>Populus tremuloides</i>	Aspen	.5	-
<i>Salix bebbiana</i>	Beaked willow	.5	-
Tall Shrubs (ht. 3 m)			
<i>Populus tremuloides</i>	Aspen	+	5
<i>Salix bebbiana</i>	Beaked willow	1	5
Low Shrubs (ht. 60 cm)			
<i>Amelanchier alnifolia</i>	Saskatoon	+	15
<i>Cornus stolonifera</i>	Red-osier dogwood	-	10
<i>Lonicera dioica</i>	Twining honeysuckle	+	2
<i>Rosa acicularis</i>	Prickly rose	15	10
<i>Symphoricarpos albus</i>	Snowberry	1	2
<i>Viburnum edule</i>	Low-bush cranberry	+	5
Dwarf Shrubs			
<i>Arctostaphylos uva-ursi</i>	Common bearberry	5	-
<i>Linnaea borealis</i>	Twinflower	1	5
<i>Vaccinium vitis-idaea</i>	Bog cranberry	2	30

Species (continued)		Cover (%)	
Scientific	Common	Plot 1	Plot 2
Forbs			
<i>Achillea millefolium</i>	Common yarrow	-	2
<i>Anemone patens</i>	Prairie crocus	+	-
<i>Anemone</i> spp.	Anemone	-	1
<i>Apocynum androsaemifolium</i>	Spreading dogbane	20	15
<i>Aster ciliolatus</i>	Lindley's aster	-	1
<i>Campanula rotundifolia</i>	Harebell	+	-
<i>Cornus canadensis</i>	Bunchberry	5	2
<i>Epilobium angustifolium</i>	Common fireweed	+	5
<i>Equisetum scirpoides</i>	Dwarf scouring-rush	+	-
<i>Equisetum sylvaticum</i>	Woodland horsetail	-	2
<i>Fragaria virginiana</i>	Wild strawberry	+	2
<i>Galium boreale</i>	Northern bedstraw	1	5
<i>Lathyrus ochroleucus</i>	Cream-colored vetchling	3	10
<i>Maianthemum canadense</i>	Wild lily-of-the-valley	1	5
<i>Orthilia secunda</i>	One-sided wintergreen	1	1
<i>Pyrola asarifolia</i>	Common pink wintergreen	+	2
<i>Pyrola chlorantha</i>	Greenish-colored wintergreen	-	1
<i>Stellaria longipes</i>	Long-stalked chickweed	-	1
<i>Vicia americana</i>	Wild vetch	+	2
Graminoids			
<i>Carex</i> spp.	Sedge	-	2
<i>Leymus (Elymus) innovatus</i>	Hairy wild rye	5	10
Mosses			
<i>Brachythecium</i> sp.		+	-
<i>Hylocomium splendens</i>	Stair-step moss	1	-

Discussion

Aspen / rose is generally a common type but this stand was striking for the amount of spreading dogbane, which clearly dominated the forb layer. Nothing similar was noted in the literature reviewed. One type documented for Saskatchewan⁶ has up to 10% spreading dogbane, but a different suite of shrubs, predominantly pin and choke cherry (*Prunus pensylvanica* and *P. virginiana*). In his studies of Wood Buffalo National Park (WBNP), Raup⁷ reported spreading dogbane only from one collection at Ft. Smith.

Significance

This appears to be a provincially rare plant community type. Only one occurrence was documented in LBCWPP, but others may be expected on similar soils and landforms.

Recommendation

This community should be recognized as a special feature of provincial significance. The CT should be recommended for addition to the Alberta Preliminary Plant Community Tracking List, proposed rank S1?. Further surveys are needed in the WPP to find and document additional stands.



Figure 3. CT2 Occurrence location

CT3. *Arctostaphylos uva-ursi* / *Elymus trachycaulus* (*Agropyron trachycaulum*) dwarf shrubland
Common bearberry / slender wheat grass dwarf shrubland

Location

La Butte Creek Wildland Provincial Park

UTM 12V 474126.65 Easting 6585095.84 Northing (NAD 83)

Site Description

This community was noted adjacent to the Slave River (Figure 1) on the top of an eroded, steep slope that represents the western edge of a remnant glaciofluvial kame. The kame is made up of coarse sand and gravel with cobbles. The site is level, well drained and windswept. The patch of dwarf shrub vegetation grades into an open jack pine / Canada buffaloberry community.



Photo by L. Allen

Comments

The dwarf shrub layer was dominant at 80% cover with forbs and graminoids contributing about 10% cover each. No bare ground was present in the plot.

Plot: 5 X 5 m

Date: July 7, 2001

Species		Cover (%)
Scientific	Common	
Shrubs		
<i>Amelanchier alnifolia</i>	Saskatoon	1
<i>Juniperus communis</i>	Ground juniper	2
Dwarf Shrubs		
<i>Arctostaphylos uva-ursi</i>	Common bearberry	80
Forbs		
<i>Anemone patens</i>	Prairie crocus	+
<i>Arnica lonchophylla</i>	Spear-leaved arnica	+
<i>Campanula rotundifolia</i>	Harebell	+
<i>Fragaria virginiana</i>	Wild strawberry	3
<i>Galium boreale</i>	Northern bedstraw	3
<i>Gentianella amarella</i>	Felwort	+
<i>Geum triflorum</i>	Three-flowered avens	+
<i>Lathyrus ochroleucus</i>	Cream-colored vetchling	1
<i>Maianthemum canadense</i>	Wild lily-of-the-valley	2
<i>Solidago spathulata</i>	Mountain goldenrod	+
<i>Vicia americana</i>	Wild vetch	+
Graminoids		
<i>Calamagrostis purpurascens</i>	Purple reed grass	1
<i>Elymus trachycaulus</i> (<i>Agropyron trachycaulum</i>)	Slender wheat grass	7
<i>Leymus (Elymus) innovatus</i>	Hairy wild rye	1
<i>Oryzopsis pungens</i>	Northern rice grass	2
<i>Poa glauca</i>	Timberline bluegrass	+
Mosses		
<i>Rhytidium rugosum</i>	pipecleaner moss	+

Discussion

In his study of WBNP, Raup⁷ noted two distinct types of "prairie" at Peace Point. His xerophytic type seems most similar to this one, being on a "wind-swept, well-drained margin" of one bluff, and on the "dry top" of a second one. However, Raup noted needle and thread (*Stipa comata*), Hooker's oat grass (*Helictotrichon hookeri*) and June grass (*Koeleria macrantha*) as the characteristic or dominant species, none of which were found at this site. Schwarz and Wein⁸ did note a common bearberry - grass community from WBNP that seems similar, although needle grasses (*Stipa* spp.), common in their community, did not occur in this one. The combination of drainage with the windswept location may be important in maintaining the dry conditions that support this CT.

Significance

The presence within WBNP of small, dry openings in the forest with “prairie elements” is well documented, starting with the pioneering work of Raup⁷ and followed up by others such as Redmann and Schwarz⁹. Although generally small in extent, these openings are considered significant because they include species at or near the northern limit of their range that are more typically “prairie elements” such as three-flowered avens⁸. A provincially rare species¹⁰, Hooker’s cinquefoil (*Potentilla hookeriana*) was found just outside the study plot. It was associated with the steep west-facing slopes of the kame, rather than the dwarf shrubland, but contributes to the significance of the location.

This was a small community, less than a hectare in size, but the only site like it located in the study area.

Recommendation

This small patch community should be considered a special feature within LBCWPP that contributes to the biodiversity of the Wildland Provincial Park. Further study is needed to determine the relationship of this small boreal dwarf shrubland to other similar communities that have been described, and their significance in the provincial context.

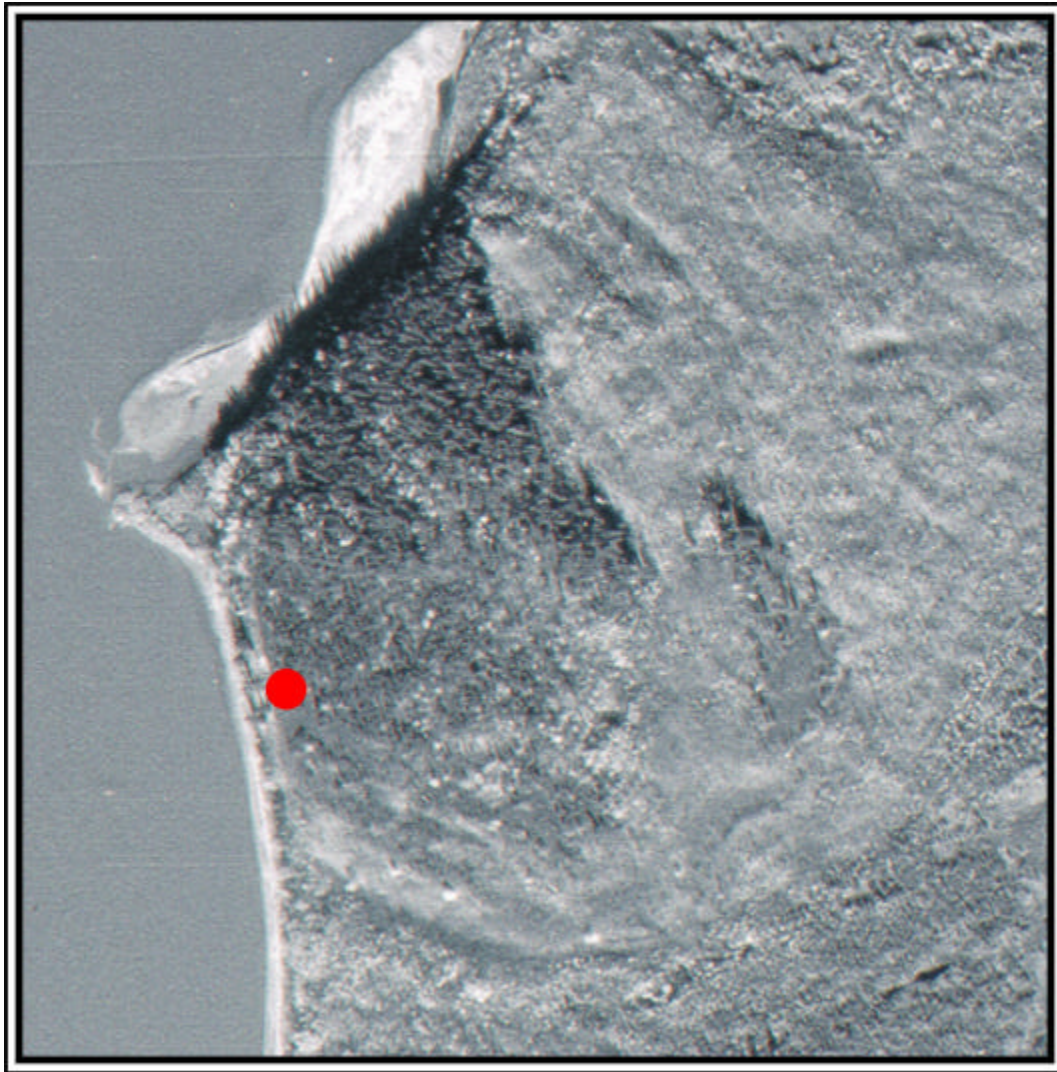


Figure 4. CT3 Occurrence location

CT4. *Arctostaphylos uva-ursi* / *Oryzopsis pungens* / *Cladina mitis* dwarf shrubland
Common bearberry / northern rice grass / reindeer lichen dwarf shrubland

Location

La Butte Creek Wildland Provincial Park

UTM 12V 486095.89 Easting 6582093.18 Northing (NAD 83)

Site Description

This community was found in an approximately .75 h. opening of a jack pine / bog cranberry (*Pinus banksiana* / *Vaccinium vitis-idaea*) woodland (Figure 1). The site was relatively flat, with bedrock at the surface.



Photo by L. Allen

Comments

The dwarf shrub layer was dominant at 50% cover. Northern rice grass and lichens, primarily *Cladina mitis*, also contributed significantly to the ground cover. Overall lichen cover was estimated at 20%, but cover was not assigned for individual species. Forbs were scattered, with wild strawberry the most common, but contributing only about 2% cover. Soils were thin, with exposed rock having about 5% cover. Although not present in the plot, scattered individuals of ground juniper (*Juniperus communis*), Canada buffaloberry (*Shepherdia canadensis*) and white spruce seedlings (*Picea glauca*) were noted in the community.

Plot: 5 X 5 m

Date: July 10, 2001

Species		Cover (%)
Scientific	Common	
Shrubs		
<i>Amelanchier alnifolia</i>	Saskatoon	+
<i>Rosa acicularis</i>	Prickly rose	+
Dwarf Shrubs		
<i>Arctostaphylos uva-ursi</i>	Common bearberry	50
Forbs		
<i>Androsace septentrionalis</i>	Northern fairy candelabra	+
<i>Anemone multifida</i>	Cut-leaved anemone	+
<i>Anemone patens</i>	Prairie crocus	+
<i>Arnica lonchophylla</i>	Spear-leaved arnica	+
<i>Campanula rotundifolia</i>	Harebell	+
<i>Fragaria virginiana</i>	Wild strawberry	2
<i>Galium boreale</i>	Northern bedstraw	+
<i>Potentilla tridentata</i>	Three-toothed cinquefoil	+
<i>Senecio ?streptanthifolius</i>	Balsam groundsel	+
<i>Solidago spathulata</i>	Mountain goldenrod	+
Graminoids		
<i>Calamagrostis purpurascens</i>	Purple reed grass	+
<i>Carex rossii</i>	Ross' sedge	+
<i>Oryzopsis pungens</i>	Northern rice grass	25
Lichens		20
<i>Cladina mitis</i>	Reindeer lichen	
<i>Flavocetraria nivalis</i>		
<i>Cladonia pyxidata</i>		
<i>Cladonia gracilis</i>		
<i>Cetraria ericetorum</i>		
<i>Cladonia amaurocraea</i>		

Discussion

The prominence of common bearberry in both this and CT3 give these communities a superficial similarity. This CT however is on bedrock with a significant lichen component, more grasses and several different species than those noted in CT3.

Common bearberry and northern rice grass are also prominent components of a saskatoon / common bearberry / northern rice grass CT that is currently on the Preliminary Plant Community Tracking List². However, as described in Willoughby et al.¹¹, the tracking list community type has a well-developed shrub layer of saskatoon and prickly rose. In CT4, the shrub layer is very sparse.

Schwarz and Wein⁸ did note a common bearberry - grass community from WBNP that seems similar, although needle grasses (*Stipa* spp.), common in their community, did not occur in this one.

Significance

As discussed under CT3, the presence in the boreal forest of small, dry openings is well documented and considered significant, because they include species considered more typically “prairie elements”. CT4 was a small community, but the only site of its kind located in the study area.

Recommendation

This small patch community should be considered a special feature within LBCWPP that contributes to the biodiversity of the Wildland Provincial Park. Further study is needed to determine the relationship of this small boreal dwarf shrubland to other similar communities that have been described, and their significance in the provincial context.



Figure 5. CT4 Occurrence location

CT 5. *Carex pseudocyperus* - *Calla palustris* wet meadow
Cyperus-like sedge – water arum wet meadow

Location

La Butte Creek Wildland Park

UTM 12V 475891.84 Easting 6580230.43 Northing (NAD 83)

Site Description

This CT was noted around the edge of open pools of water in an old meander channel, now made up of a series of wetlands (Figure 1). At the site where the plot data was collected, the CT was best expressed where the water was about 1 m deep.



photo by L. Allen

Comments

Bluejoint (*Calamagrostis canadensis*) was noted as coming in at the edge of the community as the water became shallower. Open water covered about 50% of the plot, and large logs about 5%.

Plot: 2 m X 3 m following the CT around the edge of the open water
Date: July 11, 2001

Species		Cover (%)
Scientific	Common	
Forbs		
<i>Bidens cernua</i>	Nodding beggarticks	1
<i>Calla palustris</i>	Water arum	95
<i>Cicuta virosa</i>	Narrow-leaved water-hemlock	2
<i>Galium trifidum</i>	Small bedstraw	+
<i>Hippuris vulgaris</i>	Common mare's-tail	+
<i>Lemna minor</i>	Common duckweed	1
<i>Lysimachia thyrsiflora</i>	Tufted loosestrife	1
<i>Potentilla palustris</i>	Marsh cinquefoil	1
<i>Ranunculus gmelinii</i>	Yellow water crowfoot	+
<i>Scutellaria galericulata</i>	Marsh skullcap	+
<i>Sium suave</i>	Water parsnip	1
<i>Sparganium minimum</i>	Slender bur-reed	+
<i>Stellaria longifolia</i>	Long-leaved chickweed	+
Graminoids		
<i>Calamagrostis canadensis</i>	Bluejoint	+
<i>Carex diandra</i>	Two-stamened sedge	+
<i>Carex pseudocyperus</i>	Cyperus-like sedge	5
<i>Carex utriculata</i>	Small bottle sedge	1
Bryophytes		
<i>Drepanocladus aduncus</i>	Brown moss	2

Discussion

The Cyperus-like sedge – water arum CT has been documented in two other locations. It has been found associated with beaver ponds at Elk Island National Park and at one end of a wetland in a meander channel of the Athabasca River in Richardson River Dunes Wildland Provincial Park¹². This CT was only found in the one location in LBCWPP, an area of about .75 ha of wetlands and open ponds in an old channel of the Slave River. Several beaver ponds and old river channels were inspected, but not all, so there could be other occurrences of this CT in the park.

Significance

This is recognized as a rare plant community in Alberta, and is currently ranked S1S2². The co-dominant species, *Carex pseudocyperus*, is also on the provincial vascular plant tracking list and is currently ranked S2¹⁰. A small patch of the thalloid liverwort *Riccardia multifida* was found on one of the large logs in this CT. This was the only locality in LBCWPP where this species was noted. It is a tracked species in AB, currently ranked S3?¹⁰.

Recommendation

This CT was only found in the one area, and it should be recognized as a special feature of provincial significance. Other meander channels in LBCWPP with the combination of wetlands and open ponds should be inspected to document any additional locations.

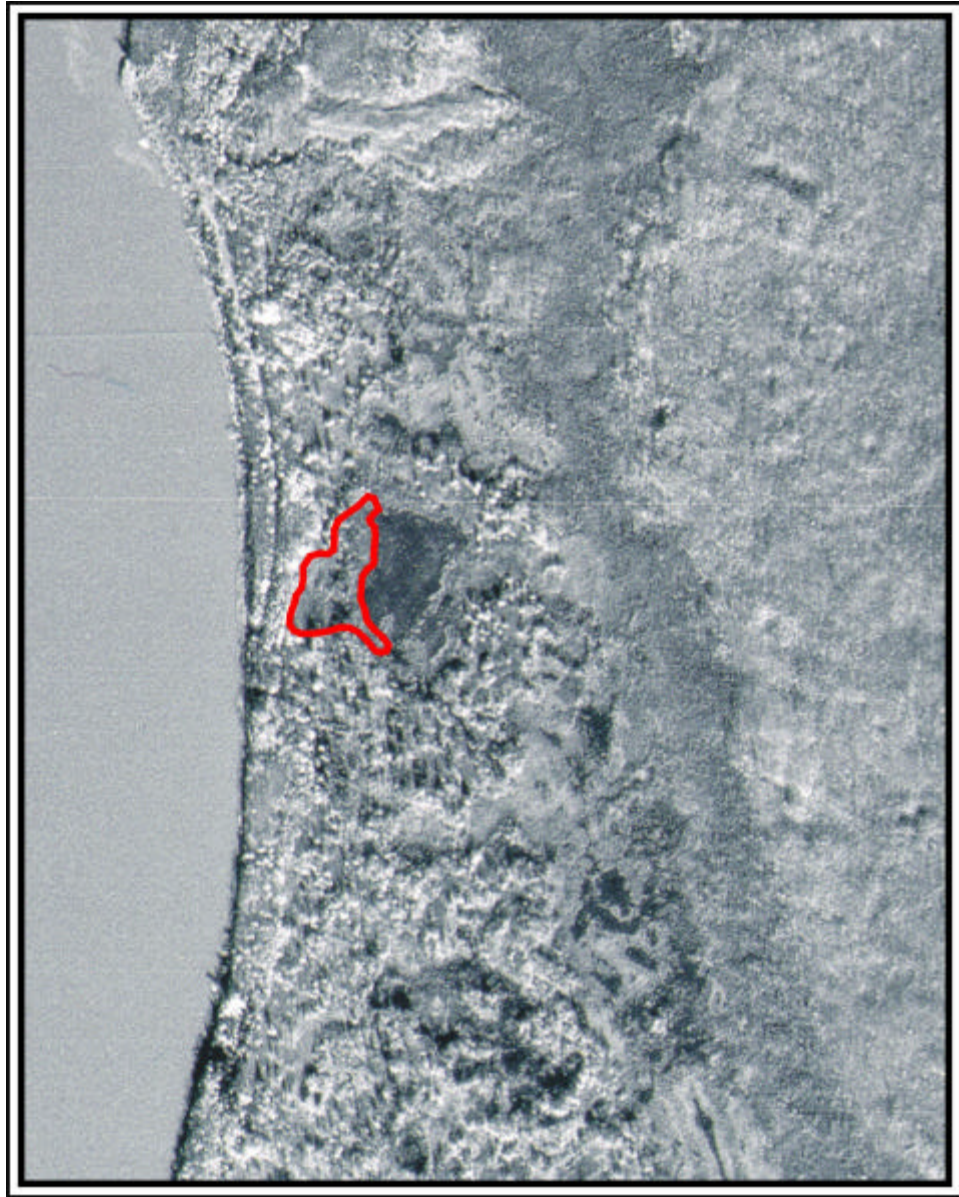


Figure 6. CT5 Occurrence location

CT6. Saline meadow complex

Location

La Butte Creek Wildland Provincial Park

Site 1: UTM 12V 478813.83 Easting 6579354.52 Northing (NAD 83)

Site 2: UTM 12V 479326.55 Easting 6586900.80 Northing (NAD 83)

Site Description

Two areas of open saline meadows were inspected in the same general area (Figure 1). At Site 1 (Figure 7), the lowest areas with standing water had patches of awned sedge (*Carex atherodes*), which graded into a more extensive, mesic, fowl bluegrass – narrow reed grass (*Poa palustris* – *Calamagrostis stricta*) meadow with bands of almost pure wire rush (*Juncus balticus*). A saline shooting star - seaside arrow-grass – mat muhly (*Dodecatheon pulchellum* - *Triglochin maritima* – *Muhlenbergia richardsonii*) community formed a band around the edge of these wetter types, in an area that may be subject to higher levels of salts through evaporation. The band was several meters wide and a list of species is provided below. It graded into a dwarf birch – short-capsuled willow / hoary willow (*Betula pumila* - *Salix brachycarpa* / *Salix candida*) shrubland.

At Site 2 (Figure 7), a relatively pure mat of brown moss (*Warnstorfia exannulata*) occurred in the lowest areas that would usually have standing water, although it was dry at the time of the site visit, July 15, 2002. Moving upslope to somewhat drier conditions, seaside arrow-grass and awned sedge were added to the mix. Higher still, the moss and sedge disappeared, leaving almost pure seaside arrow-grass. Above the seaside arrow-grass was a flat meadow with abundant saline shooting star and assorted sedge species. Mat muhly was present, but not abundant. Some small dwarf birch and hoary willow were present, but there was not a well-developed shrub community as noted at Site 1. Wire rush dominated in some small patches, but pure bands were not noted. This was a flat meadow grading on the “upstream” side immediately into a band of willows, primarily flat-leaved willow (*Salix planifolia*) and beaked willow (*S. bebbiana*), with some dwarf birch. Laboratory results show high magnesium sulphate. Toward areas of open water (see Figure 7) this community grades into the hygric wetland community dominated by awned sedge, water sedge (*C. aquatilis*), water-hemlock (*Cicuta maculata*) and western dock (*Rumex occidentalis*).

Comments

The following plot is from the saline shooting star - seaside arrow-grass – mat muhly community at Site 1.

Plot: 5 X 5 m

Date: July 15, 2001

Species		Cover (%)
Scientific	Common	Site 1
Shrubs		
<i>Salix candida</i>	Hoary willow	1
Forbs		
<i>Dodecatheon pulchellum</i>	Saline shooting star	40
<i>Erigeron lonchophyllus</i>	Hirsute fleabane	+
<i>Glaux maritima</i>	Sea milkwort	1
<i>Triglochin maritima</i>	Seaside arrow-grass	5
Graminoids		
<i>Elymus trachycaulus</i> (<i>Agropyron trachycaulum</i>)	Slender wheat grass	+
<i>Muhlenbergia richardsonis</i>	Mat muhly	40

Discussion

These sites were targeted because they seemed to have some unusual patterning and coloring on the aerial photographs. A complex was found grading from open water to awned sedge wet meadows to shrublands to bands of open saline meadows around the edge of these wetter types, in an area that may be subject to higher levels of salts through evaporation, all within an area of approx. 240 ha as outlined in Figure 7. Saline meadows have been documented in Wood Buffalo National Park⁷, and seem to be similar to the sites described above. Raup⁷ notes extensive wire rush – northern reed grass (*Juncus balticus* – *Calamagrostis inexpansa*) meadows, and areas dominated by seaside arrow-grass. He also notes a community very similar to the dwarf birch – short-capsuled willow / hoary willow shrubland mentioned above. Saline shooting star was noted as abundant in dry saline meadows in WBNP and was dominant in the community documented above, but was not found in a study of saline meadows of northwestern Alberta¹³. Seaside arrow-grass however was frequent and often abundant at all sites.

Significance

The saline meadow complex was noted from only one general location of about 240 ha in the study area and included a number of species not noted elsewhere in the park. Further study is needed to determine the significance in the provincial context and to establish the relationship to other similar communities that have been previously described.

Recommendations

The saline meadows were noted from only one general location. They should be recognized as a special feature within the Wildland Park. More work is needed to document the saline meadow community types of LBCWP and to compare them with those of WBNP and other saline meadows.

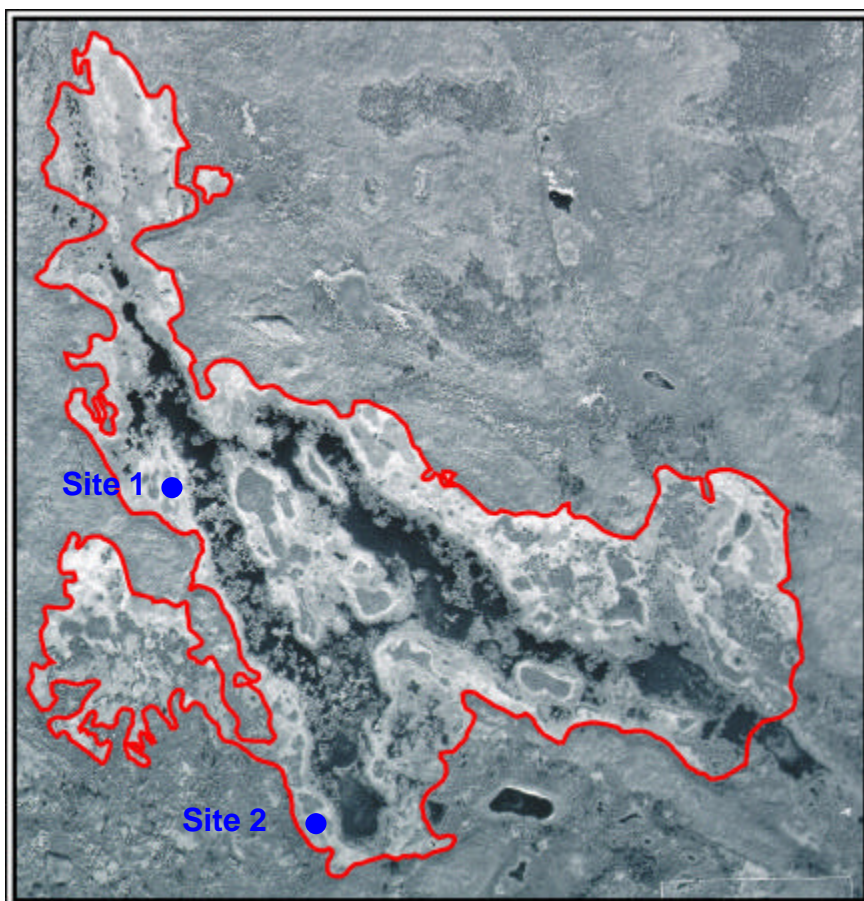


Figure 7. Estimated extent of the saline meadow (CT6) /wetland complex in LBCWPP

CT7. *Glyceria borealis* - *Sium suave* - *Sparganium angustifolium* floating-leaved aquatic community
Northern manna grass - water parsnip - narrow-leaved bur-reed floating-leaved aquatic community

Location

La Butte Creek Wildland Provincial Park

UTM 12V 491127.72 Easting 6580205.28 Northing (NAD 83)

Site Description

This community was found in about 2 m wide bands along stretches of La Butte Creek in water that was roughly 2.5 m deep. The current was slow moving with little wave action. Occurrences started near the first fork, far enough upstream from the Slave River that they were likely out of the main zone of back-flow from the river.

Comments

In the areas where this community type was best expressed, the centre of the creek was occupied by submerged vegetation, usually dominated by clasping-leaf pondweed (*Potamogeton richardsonii*). Moving towards shore, the northern manna grass - water parsnip - narrow-leaved bur-reed floating aquatic community occupied the next zone, followed by a band of emergent creeping spike-rush (*Eleocharis palustris*) right along the shoreline.



Photo by L. Allen

Plot: 2m X 5m

Date: July 8, 2001

Species		Cover (%)
Scientific	Common	
Forbs		
<i>Potamogeton alpinus</i>	Alpine pondweed	+
<i>Potamogeton gramineus</i>	Various-leaved pondweed	+
<i>Potamogeton richardsonii</i>	Clasping-leaf pondweed	1
<i>Sagittaria cuneata</i>	Arum-leaved arrowhead	+
<i>Sium suave</i>	Water parsnip	10
Graminoids		
<i>Glyceria borealis</i>	Northern manna grass	90
<i>Sparganium angustifolium</i>	Narrow-leaved bur-reed	10
Bryophytes		
<i>Fontinalis hypnoides</i>		1

Discussion

Moving upstream from the junction of the creek and the Slave River, the community first occurred in relatively small patches. After the first fork, it became quite well developed, possibly preferring the slower moving water and lack of back-flow. Creeping spike-rush consistently formed a band between this community and the shore, often with a narrow transition zone where the two communities intergraded.

Significance

Slow moving Shield streams similar to La Butte Creek are not common in Alberta, with Wallis and Wershler³ only noting four (La Butte Creek, Ryan Creek, Bocquene River and Dog River). Raup⁷ did not document any similar communities in WBNP, and noted northern manna grass and narrow-leaved bur-reed as occurring only occasionally. This CT may be of restricted distribution in the province, but aquatic communities are generally poorly documented for Alberta, making any comparisons or conclusions difficult.

Recommendation

Many of the aquatic communities found in La Butte Creek were not found elsewhere in the park and so should be considered special features. The northern manna grass - water parsnip - narrow-leaved bur-reed floating-leaved aquatic community should be recognized as a community of provincial significance and recommended for addition to the tracking list with a proposed rank of S1?. Further surveys are needed, particularly of other slow moving Shield streams, to find and document additional stands in the province.



Figure 8. CT7 Occurrence location

Discussion

The Wildland Provincial Park can roughly be divided into three units with relatively different plant communities: the Peace River Lowlands (PRL), the Kazan Upland (KU) and the aquatic and shoreline communities of La Butte Creek (LBC).

The Peace River Lowlands (PRL) make up the western portion of LBCWPP. The patterns of deposition and channel migration of the Slave River heavily influence the vegetation. There are mud flats along the river's edge, usually followed by a series of low terraces. Young terraces are often vegetated with dense sandbar willow (*Salix exigua*) communities; older ones have mature balsam poplar (*Populus balsamifera*) communities.

Meander channels are common and vegetated with a variety of communities. These vary from tall, tree-like river alder (*Alnus tenuifolia*) and willows in older, dryer channels, to sedge (*Carex* spp.) or swamp horsetail (*Equisetum fluviatile*) meadows, to areas of open ponds, depending on the age of the channel and water depth.

The main sedge meadows were dominated by awned sedge (*Carex atherodes*), sometimes with pockets of deeper water with a spangletop (*Scolochloa festucacea*) community. At the dryer edge of the sedge meadows there is often a zone of scattered *Salix* spp., moving into closed *Alnus* and *Salix* CTs. Raup⁷ discusses in detail the vegetation of the Peace / Athabasca delta and Wood Buffalo National Park, and there are many similarities between his observations and the vegetation noted for the western portion of LBCWPP.

The majority of LBCWPP is within the Kazan Upland (KU) Natural Subregion. Granite outcrops dominate this unit. The vegetation of these outcrops is quite different from that of the rest of the Wildland Provincial Park, with numerous species and plant communities not found off them. In their overview of the Kazan Upland Natural Subregion, Wallis and Wershler³ concluded that there are relatively few plant communities in the subregion. They broke them down into:

- Rock outcrops
- Jack pine woodlands on sandy plains and rocky hills
- Deciduous woodlands
- Black spruce bogs
- Sedge marshes in wet depressions
- Swamps of willow, larch and black spruce

La Butte Creek (LBC) bisects LBCWPP, and was found to have some aquatic, shoreline and levee communities not found elsewhere in the Wildland Provincial Park. The creek normally empties into the Slave River, but the change in the relief of the lowlands is minimal where creek and river intersect. As a result the creek has little current, and the slow-moving water has well-developed aquatic plant communities.

Evident during the study period was the phenomenon of "back-flow". At times, when the level in the Slave River rises, there is a back-flow of river water pushing into the creek. The water in the creek, though stained brown, was clear. The extent of back-flow of water from the Slave River, with its heavy silt load, could be easily noted. The silt deposition from the back-flow may explain the distinct, narrow levees lining the creek from roughly the first fork (Figure 1), down. In addition, high river levels temporarily dam the creek, causing the water level in the creek to rise. During this field study, the creek level rose by several decimeters. The silt deposition and shifting water levels may result in some unusual growing conditions, likely strongly influencing the shoreline plant communities, especially towards the mouth of the creek.

During the fieldwork in LBCWPP, a number of plant communities were noted in addition to those documented in detail in the previous section. These are outlined in Appendix 3. For each, the unit(s) it is found in is noted.

Recommendations

Two plant community types documented in this study are recommended for addition to the Alberta Natural Heritage Information Centre Preliminary Plant Community Tracking List.

CT2. *Populus tremuloides* / *Rosa acicularis* / *Apocynum androsaemifolium* forest
Aspen / prickly rose / spreading dogbane forest

CT7. *Glyceria borealis* - *Sium suave* - *Sparganium angustifolium* floating-leaved aquatic community
Northern manna grass - water parsnip – narrow-leaved bur-reed floating-leaved aquatic community

These are probably rare in the Alberta context and they should be considered special features within LBCWPP. Further studies to document additional occurrences are also recommended.

Two plant community types documented in this study are on the TL² and are considered rare in Alberta:

CT1. *Populus balsamifera* / *Alnus tenuifolia* - *Cornus stolonifera* / *Equisetum pratense* forest
Balsam poplar / river alder / red-osier dogwood / meadow horsetail forest

CT5. *Carex pseudocyperus* - *Calla palustris* wet meadow
Cyperus-like sedge – water arum wet meadow

Where they occur should be considered special features within LBCWPP. Further studies to document additional occurrences are also recommended.

The other community types documented in detail in this report (CT3, CT4 and CT6) are all small patch communities that add to the diversity of the WPP, and should be considered special features within LBCWPP. However, further work is needed to determine their significance in the provincial context. In particular, very limited time was spent in the saline complex (CT6 and type H15 of Appendix 3) Additional work is needed there to both characterize the communities present in the WPP and to compare those communities with other similar types reported elsewhere, in order to assess their significance.

Further work is recommended for several community types or groupings of communities noted during the course of this study, as follows:

- Aquatic communities in Alberta generally need better documentation.
- Further documentation is needed of both the aquatic and emergent CTs of LBCWPP (e.g., H12 in Appendix 3).
- More study on the *Carex* meadow vegetation of LBCWPP is needed to determine if *C. rostrata* meadows (type H4 in Appendix 3) and meadows with high *Acorus* cover (type H6 in Appendix 3) are distinctive CTs
- A detailed look at the *Physostegia ledinghamii* band (type H14 in Appendix 3) and the *Mimulus ringens* zone (type H13 in Appendix 3), is needed to see if these are definable as distinct CTs
- More work is needed to document and classify shield outcrop CTs in Alberta (including types H16, L1, B1, S6 in Appendix 3)

- Alder stands are not well documented in the province and further work is needed to determine if there are some provincially significant CTs
- Birch stands are not well documented in the province and further work is needed to determine if there are some provincially significant CTs

Limited time was spent in the eastern portion of LBCWPP, as it was difficult to access. There may be some interesting communities there that have not yet been surveyed, particularly in the pockets between rock outcrops. Difficult access also prevented more detailed survey of many wetlands distant from La Butte Creek and future work is needed to investigate their similarity to the already surveyed wetlands. Also, the aquatic and emergent communities of La Butte Creek were not looked at above the second fork (Figure 1).

Conclusion

This study concentrated on documenting small patch communities of the La Butte Creek Wildland Provincial Park. Four provincially significant plant communities were documented and other significant and sensitive communities noted. In addition, other communities noted are listed, but not documented in detail. Significant information gaps remain on this aspect of the biodiversity of the Wildland Provincial Park, and further work is recommended.

Acknowledgements

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Appendices

Appendix 1. Unusual communities or habitats that potentially occur in northeastern Alberta

Community	Reason	Landscape
Grassy, south/southwest-facing slopes	Restricted habitat ³	Open, south/southwest-facing slopes
Salt meadow	Restricted to a few sites ¹³	Graminoid openings, may have unvegetated patches
Grasslands	Restricted in extent ⁸	Graminoid openings
Pine savannah	Type suggested for possible inclusion on provincial tracking list	Open pine stands

Appendix 2. Communities on the Preliminary Plant Community Tracking List that occur in the Canadian Shield and Boreal Forest Natural Regions

Community		SRank	Landscape
Scientific name	Common name		
Communities of Upland Landscapes			
<i>Amelanchier alnifolia</i> / <i>Arctostaphylos uva-ursi</i> / <i>Oryzopsis pungens</i>	saskatoon / common bearberry / northern rice grass	S2S3	Shrubby forest openings
<i>Picea glauca</i> / <i>Cetraria islandica</i>	white spruce / lichen	S1	Open stands, sandy knolls
<i>Populus tremuloides</i> / <i>Rubus parviflorus</i> / <i>Aralia nudicaulis</i>	aspen / thimbleberry / wild sarsaparilla	S2S3	Aspen stands
Communities of Riparian Landscapes			
<i>Picea glauca</i> / <i>Alnus tenuifolia</i> – <i>Betula neoalaskana</i> / <i>Equisetum pratense</i> / <i>Hylocomium splendens</i>	white spruce / river alder - Alaska birch / meadow horsetail / stair-step moss	S3	Spruce stands, river terraces
<i>Populus balsamifera</i> / <i>Alnus tenuifolia</i> / <i>Cornus stolonifera</i> / <i>Equisetum pratense</i>	balsam poplar / river alder / red-osier dogwood / meadow horsetail	S3	Deciduous stands, river terraces
<i>Populus balsamifera</i> / <i>Rhamnus alnifolia</i> / <i>Equisetum arvense</i>	balsam poplar / alder-leaved buckthorn/common horsetail	S1	Riparian deciduous stands
<i>Populus balsamifera</i> / <i>Viburnum opulus</i> / <i>Matteuccia struthiopteris</i>	balsam poplar / high-bush cranberry / ostrich fern	S1S2	Deciduous stands, river terraces
<i>Populus tremuloides</i> / <i>Salix bebbiana</i> - <i>Corylus cornuta</i> / <i>Calamagrostis canadensis</i> – <i>Matteuccia struthiopteris</i>	aspen / Bebb's willow - beaked hazelnut / bluejoint - ostrich fern	S1	Riparian deciduous stands
<i>Salix drummondiana</i> / <i>Scirpus microcarpus</i> – <i>Calamagrostis canadensis</i>	Drummond's willow / small-fruited bulrush - bluejoint	S1	Riparian shrubland

Appendix 2. Continued

Community		SRank	Landscape
Scientific name	Common name		
Wetland communities			
<i>Andromeda polifolia</i> / <i>Sarracenia purpurea</i> / <i>Sphagnum angustifolium</i>	bog rosemary / pitcher-plant / peat moss	S1S2	Shrubby fen around small pools
<i>Carex limosa</i> – <i>Scheuchzeria palustris</i> – <i>Sphagnum majus</i> / <i>S. jensenii</i> / <i>S. riparium</i>	mud sedge - scheuchzeria / peat moss	S1	Patterned fen
<i>Carex oligosperma</i> / <i>Sphagnum subsecundum</i>	few-fruited sedge / twisted bog moss	S1S2	Channel fen on sand
<i>Carex pseudocyperus</i> - <i>Calla palustris</i>	cypress-like sedge - water arum	S1S2	beaver ponds
<i>Chamaedaphne calyculata</i> - <i>Kalmia polifolia</i> / <i>Cladina mitis</i>	leatherleaf - northern laurel / green reindeer lichen	S1S2	Channel fen on sand
<i>Isoetes echinospora</i>	northern quillwort	S1	sandy shorelines
<i>Larix laricina</i> / <i>Carex prairea</i>	tamarack / prairie sedge	S1	Larix fen
<i>Puccinellia nuttalliana</i> – <i>Suaeda calceoliformis</i> – <i>Spergularia marina</i> barren	Nuttall's salt-meadow grass - western sea-blite - salt-marsh sand spurry barren	S2	Saline seepage
<i>Salicornia europaea</i>	samphire	S2	Saline seepage
<i>Salix athabascensis</i> string shrubland	Athabasca willow string shrubland	SP	Patterned fen

Appendix 3. Additional Plant Communities noted in LBCWPP

Type*	Community	Unit**	Description	Location	Comments
Aquatic Communities					
A1	<i>Glyceria borealis</i>	LBC	Dense mats of floating leaves.	La Butte Creek, in the mouth of the south branch of the first fork.	<i>Glyceria borealis</i> is a widespread species; the CT is likely also widespread. Aquatic communities are generally poorly documented. Noted as an incidental type in low gradient streams in Montana ¹⁴ .
A2	<i>Potamogeton richardsonii</i>	LBC	Forming mats across the channel, <i>P. gramineus</i> prominent in spots.	La Butte Creek, becoming thick about 2.5 km downstream of the first fork.	Raup ⁷ noted a <i>P. richardsonii</i> - <i>P. gramineus</i> aquatic community in a slow moving creek in WBNP.
A3	<i>Potamogeton richardsonii</i> - <i>P. alpinus</i>	LBC	Forming mats across the channel. The two species have roughly even cover.	La Butte Creek, about 4 km upstream of the first fork.	Raup ⁷ did not note <i>P. alpinus</i> in his studies of WBNP.
A4	<i>Sparganium angustifolium</i> – <i>Nuphar variegatum</i>	LBC	Edge of the creek where it meanders strongly and has been dammed by beavers.	La Butte Creek, about 2 km downstream of the waterfalls.	A similar community was found in a slow moving creek in WBNP ⁷ .
Herbaceous Communities					
H1	<i>Carex aquatilis</i>	PRL	<i>C. aquatilis</i> clearly dominant, some <i>C. diandra</i> and <i>C. utriculata</i> noted.	Small wetlands in old meander channel.	Widespread CT ¹⁵ .
H2	<i>Carex aquatilis</i> - <i>Calamagrostis canadensis</i>	LBC	Edge of the creek where it meanders strongly and has been dammed by beavers.	La Butte Creek, about 2 km downstream of the waterfalls.	Similar types have been reported in WBNP ⁷ , but considered a transition type.
H3	<i>Carex atherodes</i>	PRL, KU	<i>C. atherodes</i> forms dense, essentially single species stands although there are patches with other species such as <i>Calamagrostis canadensis</i> or <i>Geum aleppicum</i> .	Dominant wet meadow CT in the Peace River Lowlands portion of the site.	Nearly pure stands of <i>C. atherodes</i> cover large areas of the Peace – Athabasca delta, with similar but slightly drier communities on river deposits in WBNP ⁷ . Widespread CT ¹⁵ .

* A = aquatic, H = herbaceous, L = lichen, B = bryophyte S= shrubland, W = woodland/forest

** KU = Kazan Upland, LBC = La Butte Creek, PRL = Peace River Lowland

H4	<i>Carex rostrata</i>	PRL	A wet, organic meadow with a significant <i>C. rostrata</i> component in the centre; additional species; <i>Eriophorum polystachion</i> , <i>C. utriculata</i> , <i>C. chordorrhiza</i> , <i>Potentilla palustris</i> , clumps of <i>Salix pedicellaris</i> ; <i>Drepanocladus aduncus</i> was the dominant moss species.	Narrow finger off one of the older meander channels of the Slave R. West of La Butte Creek in the Duck Lake area.	<i>C. rostrata</i> is rare in Alberta ¹⁰ , but it is unclear if this is a distinctive CT.
H5	<i>Carex utriculata</i> – <i>C. aquatilis</i>	PRL	Wet meadow beside beaver pond, edge of open water.	In meander channel of the Slave R.	Widespread CT ¹⁵ .
H6	<i>Carex utriculata</i> - <i>C. aquatilis</i> - <i>Acorus americanus</i>	PRL	Wet meadow with <i>Cicuta virosa</i> , <i>Scutellaria galericulata</i> , <i>Poa palustris</i> , <i>Ranunculus gmelinii</i> , <i>Calla palustris</i> , and <i>Galium trifidum</i> .	In a meander channel of the Slave R., north of the Park boundary.	<i>Acorus</i> is of restricted distribution in AB (S3) ¹⁰ and was a prominent component of this community. This may however just be a variant of the common <i>Carex utriculata</i> - <i>C. aquatilis</i> CT. More study needed.
H7	<i>Carex utriculata</i> – <i>C. atherodes</i>	PRL	Narrow wet meadow. Patches of <i>Equisetum fluviatile</i> . Occasional <i>C. aquatilis</i> and <i>Potentilla palustris</i> .	Meander scroll of the Slave R.	Likely a transition type from a wetter <i>C. utriculata</i> – <i>C. aquatilis</i> CT to the somewhat dryer <i>C. atherodes</i> CT. A similar transition type reported in WBNP ⁷ .
H8	<i>Eleocharis palustris</i>	LBC	Forms a narrow band of emergent vegetation.	Common along La Butte Creek, especially above the first fork.	Widespread CT ¹⁵ .
H9	<i>Equisetum fluviatile</i>	PRL, LBC	Strongly dominated by <i>E. fluviatile</i> , with occasional <i>Carex aquatilis</i> , <i>Alopecurus aequalis</i> .	Usually found in standing water about 20 cm deep. Encountered frequently in meander scrolls and in sheltered areas of the Slave R. shoreline and occasionally along La Butte Creek.	Widespread CT ¹⁵ , associated with quiet waters and muddy substrate ⁷ .
H10	<i>Geum aleppicum</i> – <i>Phalaris arundinacea</i> – <i>Poa palustris</i>	LBC	Occasional <i>Stachys palustris</i> , some areas primarily <i>Poa palustris</i> .	On a low terrace on an inside loop of La Butte Creek. An area of relatively recent deposition, upstream of the first fork.	Phalaris communities are widespread ¹⁵ and have been documented in WBNP ⁷ . Although this stand had a higher <i>Geum</i> and <i>Poa</i> component than the reported types, this may not constitute a significant difference.
H11	<i>Glyceria grandis</i> - <i>Calla palustris</i>	KU	Found at the edge of two beaver ponds.	Along small channels draining into La Butte Creek.	The species were paired in two locations but this is likely functionally two separate CTs with <i>Calla</i> found in deeper water. Pure <i>G. grandis</i> stands

					are common in WBNP ⁷ .
H12	<i>Hippuris vulgaris</i> / <i>Ranunculus gmelinii</i>	PRL	Small wetland, standing water. <i>Lysimachia thyrsiflora</i> & <i>Utricularia intermedia</i> also prominent.	Small wetlands in old meander channel.	Widespread species, may be a fairly common community. Similar communities with <i>Hippuris</i> reported in WBNP ⁷ as well as Manitoba and Saskatchewan ¹⁵ . More work needed to confirm types.
H13	<i>Mimulus ringens</i>	LBC	A wet shoreline community, often with shallow standing water.	Sporadic along the shore of La Butte Creek below the first forks. In the zone affected by fluctuating water levels.	<i>Mimulus ringens</i> is rare in Alberta ¹⁰ , but it is unclear if this is a distinctive CT.
H14	<i>Physostegia ledinghamii</i>	LBC	A band up to a meter wide of dense <i>P. ledinghamii</i> .	Noted along the shore of La Butte Creek, usually just above the frequent flood zone.	<i>Physostegia ledinghamii</i> is rare in Alberta ¹⁰ , but it is unclear if this is a distinctive CT.
H15	<i>Poa palustris</i> – <i>Calamagrostis stricta</i>	PRL	An extensive, mesic meadow with bands of almost pure <i>Juncus balticus</i> .	What is likely a very old channel of the Slave R., at the beginning of the continuous areas of granitic outcrops.	Raup ⁷ noted extensive <i>C. inexpansa</i> meadows in the salt plains area of WBNP but did not differentiate between <i>C. inexpansa</i> and <i>C. stricta</i> . Part of the saline meadow complex that requires further work to sort out.
H16	Rock outcrop mosaic community type	KU	Mosaic of scattered patches dominated by <i>Woodsia ilvensis</i> , <i>Polypodium sibiricum</i> & <i>Cryptogramma acrostichoides</i> ; <i>Saxifraga tricuspidata</i> ; <i>Potentilla tridentata</i> , <i>Campanula rotundifolia</i> & <i>Oryzopsis pungens</i> frequently common. <i>Abietinella abietina</i> , <i>Hedwigia ciliata</i> , <i>Polytrichum piliferum</i> , <i>Rhytidium rugosum</i> , <i>Tortula ruralis</i> are the typical mosses. <i>Cladina</i> spp., (<i>C. mitis</i> and <i>C. stellaris</i> most common), <i>Cladonia</i> spp., (<i>C. amaurocraea</i> most common) and <i>Stereocaulon</i> spp. (<i>S. tomentosum</i> most common) the typical lichens. Depending on the density and thickness of the moss and lichen mat, lichens such as <i>Arctoparmelia centrifuga</i> , <i>Melanelia</i> spp., <i>Umbilicaria</i> spp. (<i>U. muehlenbergii</i> most common), and <i>Xanthoparmelia coloradoensis</i> could also be present, along with numerous crustose species.	Typical mosaic of scattered vegetated patches on level to sloping Shield rock outcrops.	Likely found throughout the Kazan Upland. More work is needed to define the rock outcrop communities.

H17	<i>Scolochloa festucacea</i> / <i>Lemna minor</i>	PRL, KU	Dense <i>S. festucacea</i> up to 180 cm tall in standing water. <i>C. atherodes</i> intergrades at the drier edge of the CT.	Found occasionally, usually as a wetter CT in the centre of <i>C. atherodes</i> meadows.	A widespread CT ¹⁵ , common, on the Peace - Athabasca Delta ⁷ .
H18	<i>Typha latifolia</i>	PRL, LBC	Emergent CT.	At pond edges and in small patches along La Butte Creek.	A widespread CT, encountered infrequently in the study area.
Lichen communities					
L1	Arctoparmelia centrifuga – Umbilicaria muehlenbergii	KU	Almost completely covers the rocks in some areas. <i>Cladina mitis</i> occurs commonly along cracks in the rock and in depressions that collect some moisture.	On level to sloping rock surfaces.	Both dominant species are on the Lichen Tracking List ¹⁶ , but this is part of the rock outcrop community complex that should be looked at in more detail to define CTs.
Bryophyte communities					
B1	North-facing rock outcrops	KU	The most common bryophytes on these rock outcrops are <i>Bartramia pomiformis</i> , <i>Cynodontium strumiferum</i> , <i>C. tenellum</i> , <i>Neckera pennata</i> , <i>Pohlia cruda</i> and <i>Ulota curvifolia</i> . Less common bryophytes, but species that seem to only occur on these outcrops are <i>Barbilophozia hatcheri</i> , <i>Encalypta procera</i> , <i>Leskeella nervosa</i> and <i>Saelania glaucescens</i> . <i>Platismatia glauca</i> (a lichen) seems restricted to these moist/shaded rock outcrops and doesn't occur at all on trees like it does so commonly in the mountains.	Moist, shaded north-facing rock outcrops.	All of the dominant bryophytes, except <i>Pohlia cruda</i> , are tracking list species, as is one of the associated species, <i>Leskeella nervosa</i> . Some of the communities associated with north-facing outcrops likely should be considered for the Preliminary Plant Community Tracking List, once better defined.
Shrubland communities					
S1	<i>Alnus tenuifolia</i>	PRL	Dense, young alder with no understory vegetation.	Banks of the Slave R. Commonly makes up the band on the first terrace of the river bars, behind the <i>Salix exigua</i> community.	A widespread CT, occurring frequently along the Slave R.
S2	<i>Alnus tenuifolia</i> – <i>Salix bebbiana</i> / <i>Calamagrostis canadensis</i>	PRL	Shrubs up to 3 m and dense (to 90% cover). <i>Calamagrostis canadensis</i> main herb, patchy.	Commonly the first band of dense willows edging an area of open willow moving into the <i>Carex atherodes</i> meadows. Part of a series of CTs between the creek or river levees and <i>Carex atherodes</i> meadows.	Likely a widespread CT ¹⁵ , although <i>Alnus</i> stands are not well documented.

S3	<i>Alnus tenuifolia</i> – <i>Salix bebbiana</i> / <i>Equisetum pratense</i>	PRL, LBC	Large willow and river alder with closed canopy. A more mature community than the <i>Alnus tenuifolia</i> – <i>Salix bebbiana</i> / <i>Calamagrostis</i> CT.	Noted in several locations behind the levee that has built up along La Butte Creek. Part of a series of CTs between the creek or river levees and <i>Carex atherodes</i> meadows.	Likely a widespread CT, although <i>Alnus</i> stands are not well documented.
S4	<i>Amelanchier alnifolia</i> / <i>Schizachne purpurascens</i> - <i>Arctostaphylos uva-ursi</i>	KU	Open, shrubby south-facing slope. <i>A. uva-ursi</i> is the dominant species at 75% cover.	Slope at the base of a rock outcrop in the northern part of LBCWP.	Transition community of poplar understory remnants after clearing by beaver. Not a stable CT.
S5	<i>Chamaedaphne calyculata</i> - <i>Kalmia polifolia</i> / <i>Sphagnum</i> spp.	KU	Other species noted include <i>Smilacina trifolia</i> , <i>Larix laricina</i> , <i>Betula pumila</i> , <i>Carex aquatilis</i> , <i>Equisetum fluviatile</i> and <i>Menyanthes trifoliata</i> . In spots, <i>C. calyculata</i> and <i>E. fluviatile</i> are co-dominant.	Floating wetland near the south-eastern edge of the park, basin between large outcrops, no permafrost.	Wet bogs dominated by <i>C. calyculata</i> are common in the Kazan Upland ³ .
S6	<i>Juniper communis</i> / <i>Cladina mitis</i>	KU	Open Juniper with a rich associated lichen mat.	Level to sloping rock surfaces.	Part of the rock outcrop community complex that should be looked at in more detail.
S7	<i>Salix bebbiana</i> - <i>S. planifolia</i> - <i>S. petiolaris</i> / <i>Carex atherodes</i> – <i>Calamagrostis canadensis</i>	PRL, KU	An open, almost savannah-like willow CT.	Consistently encountered ringing the large <i>Carex atherodes</i> meadows.	This CT is also described in WBNP ⁷ .
S8	<i>Salix bebbiana</i> / <i>Phalaris arundinacea</i>	LBC	Occasional <i>Equisetum fluviatile</i> .	On a low terrace on an inside loop of La Butte Creek. An area of relatively recent deposition, upstream of the first fork.	A transition community from the pioneer terrace community to the <i>Populus tremuloides</i> community on the next, older terrace.
S9	<i>Salix exigua</i>	PRL	Band of dense young willow with little or no understory vegetation.	A pioneer community. Commonly the first vegetation band on the first levee adjacent to the Slave R.	A widespread CT. Common on the actively developing flood-plains of the region, often associated with sandy substrate ⁷ .
S10	<i>Salix exigua</i> / <i>Equisetum fluviatile</i>	PRL	Dense young willow pioneer community	Just north of the park boundary along the Slave R. in a deposition area sheltered by an upstream rock outcrop.	<i>S. exigua</i> commonly dominates the first vegetation band along the Slave R. This is likely a transition community, succeeding an <i>E. fluviatile</i> community that had developed in a sheltered area of gentle current.

S11	<i>Salix lucida</i> - <i>S. bebbiana</i> - <i>S. planifolia</i> / <i>Equisetum arvense</i>	PRL	Mix of exceptionally large tree-like willows, occasionally with a significant alder component.	Noted several times, usually in old meander scrolls.	Timoney ¹⁷ and Raup ⁷ noted similar CTs. Likely a fairly widespread boreal community.
S12	<i>Salix planifolia</i> / <i>Carex atherodes</i>	LBC	Dense willow shrubland, small cover of <i>C. utriculata</i> .	Shrubland on the side of the levee away from the creek, at the edge of a <i>Carex</i> wetland.	Raup ⁷ notes <i>Salix planifolia</i> as a common slough-margin shrub. Likely a widespread CT.
S13	<i>Symphoricarpos occidentalis</i> – <i>Amelanchier alnifolia</i> / <i>Arctostaphylos uva-ursi</i>	KU	South facing slopes above creek.	La Butte Creek, about 2 km downstream of the waterfalls.	Poplar understory remnants after clearing by beaver. Not a stable CT.

Woodland / Forest communities

W1	<i>Betula papyrifera</i> / <i>Alnus crispa</i> / <i>Elymus innovatus</i>	PRL	<i>Alnus crispa</i> forms an open shrub layer.	One location noted at La Butte Point.	Birch dominated communities tend to be small in area and scattered in occurrence. They are not well studied, so more studies are needed to define types and determine their significance.
W2	<i>Betula papyrifera</i> / <i>Rosa acicularis</i>	PRL	Small birch stand with a closed canopy and little understory, primarily <i>Orthilia secunda</i> , <i>Pyrola asarifolia</i> and leaf litter.	Mesic pocket on first terrace above the Slave R.	More study is needed to define birch types and determine their significance.
W3	<i>Betula papyrifera</i> / <i>Salix bebbiana</i>	PRL	Small birch stand with a closed canopy and well developed shrub layer.	Edge of willow band around <i>Carex atherodes</i> meadow.	More study is needed to define birch types and determine their significance.
W4	<i>Picea glauca</i> / <i>Hylocomium splendens</i>	KU, PRL	Mature spruce with scattered herb/dwarf shrubs and a well-developed moss layer.	Small patches scattered throughout the site on moist slopes or in pockets between outcrops.	Widespread CT ¹⁸ .
W5	<i>Picea mariana</i> / <i>Chamaedaphne calyculata</i> / <i>Equisetum fluviatile</i> / <i>Sphagnum teres</i>	KU	Ring of woodland at edge of wet, quaking fen. Spruce is widely spaced and stunted.	Part of a bog complex found between rock outcrops.	May be a transition type. Further study of the wetland pockets on the eastern part of the WPP is needed.
W6	<i>Picea mariana</i> / <i>Hylocomium splendens</i>	KU	Young stand with dense tree cover and good moss cover.	Area of extensive coniferous on glaciolacustrine deposit in the E portion of the WPP.	Widespread CT.
W7	<i>Picea mariana</i> / <i>Ledum groenlandicum</i> / <i>Rubus chamaemorus</i> / <i>Sphagnum angustifolium</i>	KU	<i>Polytrichum strictum</i> prominent.	Organic pockets between outcrops.	Widespread CT ¹⁸ .

W8	<i>Picea mariana</i> / <i>Salix myrtillofolia</i> / <i>Tomenthypnum nitens</i>	PRLKU	<i>Ledum groenlandicum</i> , <i>Sphagnum fuscum</i> and <i>S. capillifolium</i> prominent in areas.	Small wetland pockets in old river meander in PRL and between outcrops in KU.	Likely a widespread type, but not well documented in the literature.
W9	<i>Pinus banksiana</i> / <i>Arctostaphylos uva-ursi</i>	KU	Growing as small pockets on flatter spots on rock outcrops.	Scattered throughout the KU portion of the site.	A widespread Boreal and Shield CT, usually with a significant lichen component. Most extensive type in the Andrew Lake area ¹⁹ .
W10	<i>Pinus banksiana</i> / <i>Shepherdia canadensis</i> / <i>Arctostaphylos uva-ursi</i>	PRL	Pine stand with open shrub layer and dense dwarf shrub layer.	On well-drained shoulder of La Butte Point.	Likely a widespread type, but not well documented in the literature.
W11	<i>Pinus banksiana</i> / <i>Vaccinium vitis-idaea</i>	KU	Growing as small pockets in rock outcrops.	Scattered throughout the KU portion of the site.	Similar to a typical community type of the Kazan Upland ^{3,9} with <i>Hylocomium splendens</i> dominant in the moss layer
W12	<i>Populus balsamifera</i> / <i>Equisetum pratense</i>	PRL	Mature, closed poplar with a variable shrub component of <i>Rosa acicularis</i> , <i>Viburnum edule</i> , and <i>Cornus stolonifera</i> . Shrubs are dense in some patches, <i>E. pratense</i> dense in others.	On mesic to subhygric sites of old river terraces.	Likely a widespread type, but not well documented in the literature.
W13	<i>Populus balsamifera</i> / <i>Salix bebbiana</i> / <i>Equisetum pratense</i>	LBC	Mature, closed poplar with patchy shrub and forb layer.	A narrow band on the top of the levee that lines La Butte Creek for much of the channel below the first forks.	A CT common on floodplains along streams in WBNP ⁷ .
W14	<i>Populus tremuloides</i> / <i>Alnus crispa</i>	KU	Closed, mature aspen with thick shrub layer of <i>Alnus crispa</i> and little understory.	Mesic pockets between rock outcrops.	Similar communities common in the Boreal Natural Region ¹⁸ .
W15	<i>Populus tremuloides</i> / <i>Rosa acicularis</i> – <i>Cornus stolonifera</i> / <i>Equisetum pratense</i>	PRL	Closed, mature aspen with well developed shrub layer and good cover of <i>Equisetum</i> .	Mesic site, old terrace of Slave R.	Similar communities common in the Boreal Natural Region ¹⁸ .
W16	<i>Populus tremuloides</i> / <i>Shepherdia canadensis</i>	PRL KU	Closed young aspen stand.	Submesic sites, infrequent.	Similar communities common in the Boreal Natural Region ¹⁸ .
W17	<i>Populus tremuloides</i> / <i>Viburnum edule</i> - <i>Rosa acicularis</i>	PRL KU	Closed young to maturing aspen with diverse shrubs, sometimes a significant <i>Shepherdia canadensis</i> component, and occasional white spruce in understory, sparse herb layer.	Most commonly noted aspen type found on level, mesic to submesic sites throughout the park.	Similar communities common in the Boreal Natural Region ¹⁸ .

* A = aquatic, H = herbaceous, L = lichen, B = bryophyte S= shrubland, W = woodland/forest

** KU = Kazan Upland, LBC = La Butte Creek, PRL = Peace River Lowland

Figure 9. Gallery of Communities

Photos by L. Allen



A2 *Potamogeton richardsonii*



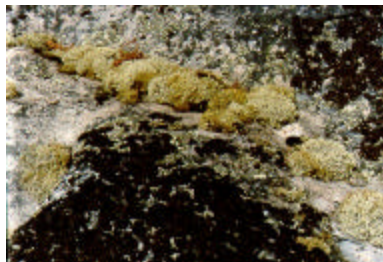
H3 *Carex atherodes*



H9 *Equisetum fluviatile*



H17 *Scolochloa festuacea* / *Lemna minor*



L1 *Arctoparmelia centrifuga* – *Umbilicaria muehlenbergii*



B1 North-facing rock outcrops



S4 *Amelanchier alnifolia* / *Schizachne purpurascens* - *Arctostaphylos uva-ursi*



S7 *Salix bebbiana* - *S. planifolia* - *S. petiolaris* / *Carex atherodes* – *Calamagrostis canadensis*



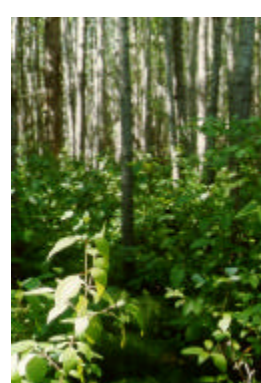
W1 *Betula papyrifera* / *Alnus crispa* / *Elymus innovatus*



W4 *Picea glauca* / *Hylocomium splendens*



W9 *Pinus banksiana* / *Arctostaphylos uva-ursi*



W15 *Populus tremuloides* / *Rosa acicularis* – *Cornus stolonifera* / *Equisetum pratense*