Vegetation Communities of Richardson River Dunes Wildland Provincial Park

Prepared by

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INTRODUCTION

Richardson River Dunes Wildland Provincial Park is situated in townships 104 and 105, ranges 6 to 9, west of the 4th meridian. The Athabasca River forms the western park boundary and the eastern boundary is relatively close to the Richardson River. This park is located predominantly within in the Central Mixedwood Natural Subregion with the southern edge dipping into the Athabasca Plain Natural Subregion and the extreme northwestern corner of the park along the Athabasca River transitional to the Peace River Lowlands Natural Subregion. (Alberta Environmental Protection 1994a). The terrain in this park consists primarily of stabilized sand dunes oriented in a northwest- southeast direction. Currently no active dunes exist in this area; however, some blowout areas are present. The predominant vegetation pattern represented on this landscape consists of pine woodlands on the upper slopes of the dunes with wetlands situated between the dunes, in the dune hollows. Fire is an important factor in the vegetation communities observed in this park.

This vegetation community assessment was one component of a large-scale inventory conducted at this park during the summer of 2000. The primary objective of this component was to describe the more commonly occurring vegetation communities within the park.

METHODS

Field Investigation

The data discussed in this report was collected using parameters provided in the *Ecological Land Survey Site Description Manual* (Alberta Environmental Protection 1994). Vegetation data was generally collected by M. Meijer and site and soils data was collected by C. Jedrzycki at 18 sites over a period of 3 days between June 19 and June 22, 2000. Information was collected for general vegetation community classification and mapping purposes, therefore, particularly with time limitations, it was more important to observe as many of the more common terrain types and vegetation communities as possible than to obtain detailed species lists for the field sites sampled.

Sample sites were selected prior to the actual fieldwork. These selections were based on differences in terrain and vegetation cover observed on maps and air photos and on accessibility. Occasionally a site was selected in the field as a result of landscape features of interest, which became apparent during the fieldwork. Vegetation sample plots were positioned so that they were

homogenous in composition and provided the best representation of the area being defined.

Dominant plant species (including lichens and bryophytes) and any other plant species visible were recorded. Site and soils information was also gathered at these sites. It should be noted that a thorough plant inventory of the entire plot was not conducted, due to time limitations. Species that were present in trace amounts or not easily observed may have been omitted.

Reconnaissance plots were conducted at 10 of the sites visited. Site and dominant vegetation data were only collected at these plots. Plants were identified to species where possible. In a number the reconnaissance plots, some plants remained unidentified (no voucher samples were collected) and species information was not available.

Community Characterization

The following sequence identifies the approach utilized to characterize communities.

1. Field information for each sample plot was reviewed and each plot was labeled with a field-identified community, which was based on the dominant vegetation species present. This task was generally completed in the field.
2. A qualitative approach was then used to group similar field identified communities into community groupings based on site moisture and nutrients and dominant canopy species (or where absent, tallest physiognomic strata). Canopy cover was described for woodlands as open or closed, with canopies of 6 to 50 % cover defined as open and > 50 % cover closed.
3. Woodland communities were further refined based on presence of dominant shrub, forb, moss and lichen species present.

In some cases (some of the reconnaissance plots) there was inadequate information to define communities because species remained unidentified.

Any reference to pine in this report refers to Jack pine (*Pinus banksiana*). Both white birch (*Betula papyrifera*) and Alaska birch (*Betula neoalaskana*) were present in this area. Often these two species were difficult to distinguish; therefore, in some cases species identification may be incorrect.

Presentation of Community Information

Community Name - The naming convention for the communities includes the forestry code for the tree layer and the 7-letter species code (Alberta Environmental Protection 1994) for other dominant species in the community. The community name is based on the dominant species within each strata, as observed in the study plots. Separations between strata have been indicated by

a forward slash (/) and co-dominant species within a strata have been separated by a dash (–). If a species was considered important, but occurred only occasionally, the species name was enclosed within brackets ( ).

Location - Location information makes reference to the UTM coordinates obtained through the use of a handheld geographical positioning system (GPS).

Air Photos - The air photo roll and photo numbers provided include the photos on which the GPS coordinates or sites are located. The photos mentioned can be used as a stereo pair.

Site and Soil - Site and soil conditions obtained at each sampled site which is representative of the specific vegetation community is listed. This information is further reviewed in the discussion.

Vegetation – The vegetation composition of each plot belonging to the identified community is listed. Seven-letter codes, scientific names and common names (where applicable) are listed for each species observed in the sampled plots. Cover data is presented as % cover. Cover values of 0.5 indicate 0 to 0.5 % covers, including single plants or trace amounts. Due to the limited number of plots representing each community, cover averages for community plant species may not be accurate; therefore, they have not been listed. Aspects of the vegetation are further reviewed in the discussion.

Field Guide Classification – This classification refers to the classification of the identified community relative to the appropriate existing field guides. Both the Boreal Mixedwood and Canadian Shield Sections of the *Field Guide to Ecosites of Northern Alberta* (Beckingham and Archibald 1996) were reviewed and the identified communities were classified based on the appropriate natural subregion classification and/or the classification which seemed to best identify the community. In cases where an exact match did not exist, a best fit was given and an explanation was then provided detailing the significant differences.

Discussion - This section involves elaboration of important aspects of the community. Any additional observations made at the sites are noted here.

RESULTS

The 18 sites visited included; two wetland communities (3 sites), one deciduous woodland community (1 site), one shrub community (1 site), one mixed woodland community (1 site) one pine regeneration community (2 sites) and three pine woodland communities (10 sites). See Table 1 for a complete listing of sampled sites, their field identified communities and the identified communities. The community descriptions provided in this report are based on information gathered at the sampled sites. Pine communities were the most extensive in this park. Pine tends to thrive in the sandy xeric, oligotrophic conditions, which exist in

much of the park. The presence of aspen generally reflected increased moisture and nutrient availability. Wetlands tended to be associated with low-lying areas where often, sandy sediments were overlain by a veneer or blanket of organic material. These areas received moisture through drainage or high water tables.

Due to the relatively small sample size and limited area sampled, distinguishing specific community variation was difficult because the full range of potential communities and community characteristics may not have been observed at the sampled sites. Some identified communities may be more representative of transitional zones. An attempt was made to group sites that had the most similarity. In some cases there are still significant differences; however, more sites have to be investigated to determine specific community distinguishing characteristics.

It should be noted that only a very small portion of the park was sampled. The sites visited appeared to represent some of the more common communities in the park; however, the list presented in this report should be considered a preliminary list, until more areas of the park have been sampled. The species identified at the field sites and presented in this report are by no means an exhaustive listing of all plant species found in the park, as mentioned previously. Other components of this inventory which dealt with rare and unusual plant communities and plant species (Allen and Johnson 2001, Gould in progress) also provide insight into the vegetation associated with this landscape..

Table 1. Communities identified at Richardson River Dunes Wildland Provincial Park. Reconnaissance plots are noted in italics.

Plot	Site Conditions	Physiognomic Structure	Field Identified Community	Community
RIC 05	*xeric, submesotrophic*	*open coniferous woodland*	*Pj / Pine needles - Lichen*	
RIC 07	*xeric, submesotrophic*	*open coniferous woodland*	*Pj / Pine needles - Lichen*	**Pj / Pine needles – Clad spp.**
RIC 11	*xeric, submesotrophic*	*closed coniferous woodland*	*Pj / Lichen - Pine needles*	
RIC 06	*xeric, submesotrophic*		*Pj / Arct uva / Lichen - Moss*	
RIC 08	*xeric, submesotrophic*	*closed coniferous woodland*	*Pj / Moss*	**Pj / Poly pil – Clad sp.**
RIC 10	*xeric, submesotrophic*	*closed coniferous woodland*	*Pj / moss*	
RIC 12	*xeric, submesotrophic*	*closed coniferous woodland*	*Pj / Huds tom*	
RIC 02	xeric, submesotrophic	closed coniferous woodland	Pj / Geoc liv / Pine needles	
RIC 03	xeric, submesotrophic	closed coniferous woodland	Pj / Alnu cri / Pine needles	**Pj / Alnu cri / Pine needles**
RIC 15	xeric, mesotrophic	open coniferous woodland	Pj / Alnu cri - Vacc myr / Pine Needles	
RIC 09	*xeric, submesotrophic*	*tall shrubland*	*Pinu ban / (Vacc myr) / Pine needles*	
RIC 16	xeric, submesotrophic	tall shrubland	Pinu ban / Vacc vit - Vacc myr / Pine needles	**Pinu ban / Vacc myr / Pine needles**
RIC 17	submesic, mesotrophic	closed mixed woodland	Aw - Pj / Alnu cri / Vacc myr	**Aw - Pj / Alnu cri / Vacc myr**
RIC 04	mesic, mesotrophic	low shrubland - riparian	Alnu cri - Salix sp. / Equi syl / Cala can	**Alnu cri - Salix sp. / Equi syl / Cala can**
RIC 01	mesic, permesotrophic	closed deciduous woodland	Aw / Equi pra	**Aw / Equi pra**
RIC 14	*hygric, mesotrophic*	*wetland - low shrub fen in transitions*	*Pinu ban - Ledu gro / Poly str*	***Pinu ban - Ledu gro / Poly str***
RIC 18	hydric, permesotrophic	wetland - sedge fen	(Sali ped) / Care utr	**Sedge Community**
RIC 13		*wetland - sedge fen*	*sedge community*	

Pj / Pine needles – Clad spp.
(Jack pine / Pine needles - Lichen)

Location:

Site 5	12V497985	UTM6429184	NAD 83
Site 7	12V498408	UTM6429580	NAD 83
Site 11	12V490395	UTM6448041	NAD 83

Air photos

Site 5	AS4977	#7-9
Site 7	AS4977	#7-9
Site 11	AS4977	#118-119

Site and Soil

Field Sites	**5**	**7**	**11**
Site			
Slope (%)	1	10	2
Aspect (°)	9	315	270
Exposure	wind	wind, cold air drainage	not applicable
Flood Hazard	no hazard	no hazard	no hazard
Soil Drainage	rapid	rapid	rapid
Site-Macro	upland	upland	upland
Site Meso	middle slope	upper slope	upper slope
Site Shape	straight		straight
Moisture	xeric	xeric	xeric
Nutrients	submesotrophic	submesotrophic	submesotrophic
Factors	fire, terrain	fire, terrain	fire
Site Micro	straight	irregular	straight
Soils			
Parent Material	eolian blanket	eolian blanket /moraine	eolian blanket /moraine
Surface Expression	level	rolling	level
Soil Subgroup	E.EB	E.EB	E.EB
Dominant Texture	S	S	S
Effective Texture	S	S	S
Texture	S	S	S

Vegetation

Code	**Scientific Name**	**Common Name**	**5 Cover**	**7 Cover**	**11 Cover**
Canopy					
PINUBAN	*Pinus banksiana*	jack pine	7	35	65
Low Shrubs					

Code	Scientific Name	Common Name	5 Cover	7 Cover	11 Cover
ALNUCRI	*Alnus crispa*	green alder			1
ARCTUVA	*Arctostaphylos uva-ursi*	common bearberry	1	1	2
HUDSTOM	*Hudsonia tomentosa*	sand heather		2	
PINUBAN	*Pinus banksiana*	jack pine	1	1	0.5
VACC MYR	*Vaccinium myrtilloides*	common blueberry		1	1
VACCVIT	*Vaccinium vitis-idaea*	bog cranberry			1
Forbs					
ANEMMUL	*Anemone multifida*	cut-leaved anemone			0.5
ASTELAE	*Aster laevis*	smooth aster			0.5
FRAGVIR	*Fragaria virginiana*	wild strawberry			0.5
MAIACAN	*Maianthemum canadense*	wild lily-of-the-valley			1
PYROASA	*Pyrola asarifolia*	common pink wintergreen			0.5
PYROCHL	*Pyrola chlorantha*	greenish-flowered wintergreen			0.5
Grass					
CARESIC	*Carex siccata*	hay sedge		0.5	
FESTSAX	*Festuca saximontana*	Rocky Mountain fescue			0.5
Moss					
POLYPIL	*Polytrichum piliferum*	awned hair-cap	1	2	4
Lichen					
CLADCRY	*Cladonia cryptochlorophaea*		1	2	1
CLADGRA	*Cladonia gracilis*		1	2	1
CLADMIT	*Cladina mitis*	reindeer lichen	2	45	20
CLADSUL	*Cladonia sulphurina*			0.5	1
PELTMAL	*Peltigera malacea*				0.5
Litter					
pine needles			40	high	high
deadfall					5

Field Guide Classification

Best fit	Site 5 & 7	Boreal Mixedwood A1.1	(Pj/bearberry/lichen)
Best fit	Site 11	Boreal Mixedwood A1.3	(Pj/green alder/lichen)

There was no significant shrub cover at any of these sites. Blueberry *(Vaccinium myrtilloides*), bearberry (*Arctostaphylos uva-ursi*) and green alder (*Alnus crispa*) covers ranged from 1 to 2 %. The best fit for Site 11 was identified based on the presence of an extremely low cover of green alder. None of these sites ideally fit into the communities described in the classification due to the low shrub cover and the lack of a prominent lichen cover. Perhaps Site 11 should be considered separate from the other 2 sites based on the presence of a much higher canopy cover; however the in the existent post burn condition they appeared to have a similar floristic composition.

Discussion

Reconnaissance sampling was conducted at these sites. All of these sites were located along the Fort Chip winter road. A minimal understory was present and

generally any shrubs present were ericaceous. Site 11 appeared to have a slightly moister soil surface, reflected in the higher shrub diversity. This site also contained a significantly higher cover of lichen (23 %). The closed canopy at this site may have contributed to decreased evapotranspiration, resulting in increased moisture availability. Fire was an important factor in this community. The presence of higher lichen cover at site 11 may have been a reflection of the increased moisture availability or an indication that the surface substrate at this site was less impacted by fire in the recent past. No major elevation variation in terrain occurred in locations where this community was observed. The soils were sandy. Small patches of green alder occurred throughout the community at site 11. This presence of alder may indicate that this site is possibly transitional to the Pj / Alnu cri – Vacc myr / Pine needles community (a community defined later in this report).

Pj / Poly pil – Clad sp.
(Jack pine / Moss - Lichen)

Location:

Site 6	12V498072	UTM 6429256	NAD 83
Site 8	12V499059	UTM 6430182	NAD 83
Site 10	12V502013	UTM 6434015	NAD 83
Site 12	12V490480	UTM 6448120	NAD 83

Air photos

Site 6	AS4977	#7-9
Site 8	AS4977	#7-9
Site 10	AS4977	#24-25
Site 12	AS4977	#118-119

Site and Soil

Field Sites	**6**	**8**	**10**	**12**
Site				
Slope (%)		3	0	5
Aspect (°)		210		270
Exposure	not applicable	not applicable	not applicable	not applicable
Flood Hazard	no hazard	no hazard	no hazard	no hazard
Soil Drainage	rapid	rapid	rapid	rapid
Site-Macro	upland	upland	upland	upland
Site Meso	crest	crest	level	level
Site Shape	convex	straight	straight	straight
Moisture	xeric	xeric	xeric	xeric
Nutrients	submesotrophic	submesotrophic	submesotrophic	submesotrophic
Site Micro	irregular	straight	straight	irregular
Soils				
Parent Material	eolian blanket / moraine	eolian blanket / moraine	eolian blanket / moraine	eolian blanket / moraine
Surface Expression	level	level	level	hummocky
Soil Subgroup	E.EB	E.EB	E.EB	E.EB
Dominant Texture	S	S	S	S
Effective Texture	S	S	S	S
Texture	S	S	S	S

Vegetation

Code	**Scientific Name**	**Common Name**	**6 Cover**	**8 Cover**	**10 Cover**	**12 Cover**
Canopy						
PINUBAN	*Pinus banksiana*	jack pine	> 50	70	70	50
Low Shrubs						
ARCTUVA	*Arctostaphylos uva-ursi*	common bearberry	10	5		5

Code	Scientific Name	Common Name	6 Cover	8 Cover	10 Cover	12 Cover
HUDSTOM	*Hudsonia tomentosa*	sand heather				25
VACC MYR	*Vaccinium myrtilloides*	common blueberry	5			
Grass						
SEDGESP	Unnamed s edge species					2
Moss						
MOSSSPP	Unnamed moss species	unidentified moss	NV	80	95	
Lichen						
LICHENSP	Unnamed lichen species	unidentified moss	NV			
Litter						
deadfall			10			

Field Guide Classification

Best fit Boreal Mixedwood A1.1 (Pj/bearberry/lichen)

This best fit was identified based on the shrub cover data that was collected. Site 10 had no understory. All of these sites lack the lichen cover that is associated with the A1.1.

Discussion

Reconnaissance sampling was also conducted at these sites. All of these sites were located along the Fort Chip winter road. Site conditions for this community were generally the same as for the previous community. Pine needle cover was not assessed for these sites. This community was very simila r to the previously identified community and may actually be the same community. The only major difference related to the substrate cover. The sites belonging to these 2 communities were sampled by 2 different people (one individual sampled sites 5, 7, and 11, another individual sampled sites 6, 8, 10 and 12). It appears that the communities were defined based on different substrate covers. At this time the communities have been separated; however, they could be combined.

Pj / Alnu cri / Pine needles
(Jack pine / Green alder / Pine needles)

Location:

Site 2	12V479359	UTM6439269	NAD 83
Site 3	12V479489	UTM6439183	NAD 83
Site 15	12V486372	UTM6433558	NAD 83

Air photos

Site 2	AS4977	#45-46
Site 3	AS4977	#45-46
Site 15	AS4977	#14-15

Site and Soil

Field Sites	**2**	**3**	**15**
Site			
Slope (%)	5	3	0
Aspect (°)	280	20	
Exposure	not applicable	not applicable	not applicable
Flood Hazard	no hazard	no hazard	no hazard
Soil Drainage	rapid to very rapid	rapid	rapid
Site-Macro	upland	upland	upland
Site Meso	middle slope	crest	level
Site Shape	straight	straight	straight
Moisture	xeric	xeric	xeric
Nutrients	submesotrophic	submesotrophic	mesotrophic3
Site Micro	irregular	irregular	irregular
Soils			
Parent Material	eolian blanket / moraine	eolian / moraine	eolian blanket / moraine
Surface Expression	undulating	undulating	rolling
Soil Subgroup	E.EB	E.EB	E.EB
Dominant Texture	S	S	S
Effective Texture	S	S	S
Texture	S	S	LS/S

Vegetation

Code	**Scientific Name**	**Common Name**	**2 Cover**	**3 Cover**	**15 Cover**
Main Canopy					
PINUBAN	*Pinus banksiana*	jack pine	55	20	40
Understory					
PINUBAN	*Pinus banksiana*	jack pine	5	60	5
Tall Shrubs					

Code	Scientific Name	Common Name	2 Cover	3 Cover	15 Cover
PINUBAN	*Pinus banksiana*	jack pine		2	0.5
Low Shrubs					
ALNUCRI	*Alnus crispa*	green alder	2	20	25
AMELALN	*Amelanchier alnifolia*	saskatoon			0.5
ARCTUVA	*Arctostaphylos uva-ursi*	common bearberry	3		2
LINNBOR	*Linnaea borealis*	twinflower	1		1
PICEGLA	*Picea glauca*	white spruce	0.5		
PINUBAN	*Pinus banksiana*	jack pine	1		0.5
POPUTRE	*Populus tremuloides*	aspen			0.5
ROSAACI	*Rosa acicularis*	prickly rose			1
VACC MYR	*Vaccinium myrtilloides*	common blueberry	1	2	20
VACCVIT	*Vaccinium vitis-idaea*	bog cranberry	1		3
Forbs					
ACHIMIL	*Achillea millefolium*	common yarrow			0.5
ANEMMUL	*Anemone multifida*	cut-leaved anemone			0.5
ARALNUD	*Aralia nudicaulis*	wild sarsaparilla		0.5	
ASTELAE	*Aster laevis*	smooth aster			0.5
EPILANG	*Epilobium angustifolium*	fireweed		1	0.5
GEOCLIV	*Geocaulon lividum*	northern bastard toadflax	2	1	0.5
LYCOCOM	*Lycopodium complanatum*	ground-cedar			3
MAIACAN	*Maianthemum canadense*	wild lily-of-the-valley	1	1	1
PYROCHL	*Pyrola chlorantha*	greenish-flowered wintergreen	0.5	0.5	
SOLIMUL	*Solidago multiradiata*	alpine goldenrod	0.5		0.5
Grass					
CARESIC	*Carex siccata*	hay sedge		0.5	
ELYMINN	*Elymus innovatus*	hairy wild rye		0.5	
ORYXASP	*Oryzopsis asperifolia*	white-grained mountain rice grass			0.5
ORYXPUN	*Oryzopsis pungens*	northern rice grass	0.5	0.5	0.5
Moss					
DICRPOL	*Dicranum polysetum*	wavy dicranum	0.5		
DICRUND	*Dicranum undulatum*	wavy dicranum			0.5
PLEUSCH	*Pleurozium schreberi*	Schreber's moss	3		0.5
POLYJUN	*Polytrichum juniperinum*	juniper hair-cap			10
POLYPIL	*Polytrichum piliferum*	awned hair-cap	5		
Lichen					
CLADCOR	*Cladonia cornuta*		1	0.5	
CLADCRY	*Cladonia cryptochlorophaea*		0.5	0.5	0.5
CLADGRA	*Cladonia gracilis*		1	0.5	0.5
CLADMIT	*Cladina mitis*	reindeer lichen	0.5		0.5
CLADVER	*Cladonia verticillata*			0.5	
Litter					
pine needles			40	30	
deadfall			15	20	

Field Guide Classification

Best fit Boreal Mixed wood A1.3 Pj/green alder/lichen

This field guide classification was identified as a best fit because the community lacked the lichen cover indicated in the field guide classification. Rather, a high cover of pine needles was present.

Discussion

All of the sites in this community have a green alder component; however, at site 2 the alder was much lower in cover (2 %) and associated with low-lying areas or draws. The increased floristic diversity evident at site 15 was a reflection of the higher nutrient conditions. This may have been attributable to the loamy sand at the surface of the soil profile. The loam component may have enhanced nutrient holding capacity.

Pinu ban / Vacc myr / Pine needles
(Jack pine regeneration / Blueberry / Pine needles)

Location:

Site 9	12V501175	UTM6432194	NAD 83
Site 16	12V486175	UTM6433651	NAD 83

Air photos

Site 9	AS4977	#24-25
Site 16	AS4977	#14-15

Site and Soil

Field Sites	**9**	**16**
Site		
Slope (%)	1	3
Aspect (°)	260	75
Exposure	not applicable	not applicable
Flood Hazard	no hazard	no hazard
Soil Drainage	rapid	rapid
Site-Macro	upland	upland
Site Meso	upper slope	plain
Site Shape	straight	straight
Moisture	xeric	xeric
Nutrients	submesotrophic	submesotrophic
Factors	fire	
Site Micro	straight	irregular
Soils		
Parent Material	eolian blanket / moraine	eolian blanket / moraine
Surface Expression	level	undulating
Soil Subgroup	E.EB	E.EB
Dominant Texture	S	S
Effective Texture	S	S
Texture	S	S

Vegetation

Code	Scientific Name	Common Name	9 Cover	16 Cover
Tall Shrubs				
PINUBAN	*Pinus banksiana*	jack pine	70	50
Low Shrubs				
ALNUCRI	*Alnus crispa*	green alder		1
AMELALN	*Amelanchier alnifolia*	saskatoon		0.5
ARCTUVA	*Arctostaphylos uva-ursi*	common bearberry		1
CORNCAN	*Cornus canadensis*	bunchberry		3

Code	Scientific Name	Common Name	9 Cover	16 Cover
LINNBOR	*Linnaea borealis*	twinflower		1
PINUBAN	*Pinus banksiana*	jack pine	15	40
ROSAACI	*Rosa acicularis*	prickly rose		2
RUBUIDA	*Rubus idaeus*	wild red raspberry		0.5
VACC MYR	*Vaccinium myrtilloides*	common blueberry	0.5	4
VACCVIT	*Vaccinium vitis-idaea*	bog cranberry		6
Forbs				
ANEMMUL	*Anemone multifida*	cut-leaved anemone		1
CAMPROT	*Campanula rotundifolia*	harebell		0.5
EPILANG	*Epilobium angustifolium*	fireweed		0.5
GALIBOR	*Galium boreale*	northern bedstraw		0.5
MAIACAN	*Maianthemum canadense*	wild lily-of-the-valley		0.5
PYROASA	*Pyrola asarifolia*	common pink wintergreen		0.5
SENESTR	*Senecio streptanthifolius*	northern ragwort		0.5
Grass				
CARESIC	*Carex siccata*	hay sedge	0.5	
ORYXPUN	*Oryzopsis pungens*	northern rice grass		0.5
Moss				
PLEUSCH	*Pleurozium schreberi*	Schreber's moss		1
POLYJUN	*Polytrichum juniperinum*	juniper hair-cap		10
POLYPIL	*Polytrichum piliferum*	awned hair-cap	3	1
Lichen				
CLADCOR	*Cladonia cornuta*		0.5	0.5
CLADCRY	*Cladonia cryptochlorophaea*		1	0.5
CLADDEF	*Cladonia deformis*		0.5	0.5
CLADGRA	*Cladonia gracilis*		0.5	0.5
CLADMIT	*Cladina mitis*	reindeer lichen	0.5	0.5
CLADSUL	*Cladonia sulphurina*			
CLADVER	*Cladonia verticillata*			
LICHENSP	*Unnamed lichen species*			
PELTMAL	*Peltigera malacea*			
Litter				
pine needles			75	HIGH
deadfall			20	40

Field Guide Classification

Best fit Boreal Mixedwood A1.2 (Pj/blueberry/lichen)

The community appeared to be an early seral stage of field guide community identified as Pj/blueberry/lichen. The community lacked the lichen cover, which defined A1.2. Pine needle cover was high. The entire area had previously been burned. Following burns, pine regeneration is often evident immediately while the development of lichen cover takes much longer.

Discussion

This tall shrub community was defined by the “dog-hair” stands of regenerating pine that were present. Deadfall was high at both sites. Site 16 had higher floristic diversity than site 9. The topo-position of site 9 (upper west-facing slope) left the area more exposed than the level northerly facing terrain at site 16. This community appeared to be an earlier seral stage of one of the previously defined communities.

Squirrel holes and a midden were observed at site 16.

Aw - Pj / Alnu cri / Vacc myr
(Aspen - Jack pine / Green alder / Blueberry)

Location:

Site 17 12V485854 UTM6434561 NAD 83

Air photos

Site 17 AS4977 #74-75

Site and Soil

Site

Slope (%)	0
Aspect (°)	
Exposure	not applicable
Flood Hazard	no hazard
Soil Drainage	rapid
Site-Macro	upland
Site Meso	level
Site Shape	straight
Moisture	submesic
Nutrients	mesotrophic
Site Micro	straight

Soils

Parent Material	eolian blanket / moraine
Surface Expression	level
Soil Subgroup	E.EB
Dominant Texture	S
Effective Texture	S
Texture	S

Vegetation

Code	Scientific Name	Common Name	Cover
Canopy			
PINUBAN	*Pinus banksiana*	jack pine	30
POPUTRE	*Populus tremuloides*	aspen	40
Tall Shrubs			
PINUBAN	*Pinus banksiana*	jack pine	1
POPUTRE	*Populus tremuloides*	aspen	1
Low Shrubs			
ALNUCRI	*Alnus crispa*	green alder	60
CORNCAN	*Cornus canadensis*	bunchberry	4
LEDUGRO	*Ledum groenlandicum*	common Labrador tea	0.5
LINNBOR	*Linnaea borealis*	twinflower	2
POPUTRE	*Populus tremuloides*	aspen	2

Code	Scientific Name	Common Name	Cover
ROSAACI	*Rosa acicularis*	prickly rose	2
SALIBEB	*Salix bebbiana*	beaked willow	1
VACC MYR	*Vaccinium myrtilloides*	common blueberry	40
VACCVIT	*Vaccinium vitis-idaea*	bog cranberry	1
Forbs			
ACHIMIL	*Achillea millefolium*	common yarrow	0.5
EPILANG	*Epilobium angustifolium*	fireweed	1
EQUISYL	*Equisetum sylvaticum*	woodland horsetail	0.5
GALIBOR	*Galium boreale*	northern bedstraw	0.5
GEOCLIV	*Geocaulon lividum*	northern bastard toadflax	0.5
LYCOCOM	*Lycopodium complanatum*	ground-cedar	0.5
MAIACAN	*Maianthemum canadense*	wild lily-of-the-valley	1
Grass			
CALACAN	*Calamagrostis canadensis*	bluejoint	1
CARESIC	*Carex siccata*	hay sedge	0.5
Moss			
POLYJUN	*Polytrichum juniperinum*	juniper hair-cap	2
Litter			
pine needles			
deadfall			20

Field Guide Classification

Boreal Mixedwood B1.2 Pj-Aw/blueberry-green alder

This community fits into the field guide classification system very well.

Discussion

This community is associated with moister and richer site conditions than the previously defined communities. The community was located on level terrain situated in close proximity to a lake. Proximity to open water was a major contributing factor to moister site conditions. Topographic position also contributed to the enhanced nutrient conditions. The presence of aspen (*Populus tremuloides*) and a diverse suite of forbs reflected the increased moisture and nutrient availability. Two low shrub layers were present; green alder (*Alnus crispa*) and blueberry. Charred stumps and burned deadfall were evidence of a recent burn. Much of the deadfall was small in diameter.

Alnu cri – Salix sp. / Equi syl / Cala can
Green alder – Willow / Woodland horsetail / Bluejoint

Location:

Site 4 12V479656 UTM6439351 NAD 83

Air photos

Site 4 AS4977 #45-46

Site and Soil

Site

Slope (%)	65
Aspect (°)	180
Exposure	cold air drainage
Flood Hazard	rare
Soil Drainage	well
Site-Macro	valley floor
Site Meso	lower slope
Site Shape	concave
Moisture	mesic
Nutrients	mesotrophic
Site Micro	irregular

Soils

Parent Material	eolian / moraine
Surface Expression	s
Soil Subgroup	O.R
Dominant Texture	S
Effective Texture	S
Texture	S

Vegetation

Code	Scientific Name	Common Name	Cover
Tall Shrubs			
BETUNEO	*Betula neoalaskana*	Alaska Birch	2
POPUBAL	*Populus balsamifera*	balsam poplar	2
Low Shrubs			
ALNUCRI	*Alnus crispa*	green alder	12
ALNUTEN	*Alnus tenuifolia*	river alder	1
BETUNEO	*Betula neoalaskana*	Alaska Birch	2
CORNCAN	*Cornus canadensis*	bunchberry	2
PICEGLA	*Picea glauca*	white spruce	1
PINUBAN	*Pinus banksiana*	jack pine	1
POPUBAL	*Populus balsamifera*	balsam poplar	3
RUBUIDA	*Rubus idaeus*	wild red raspberry	0.5
SALISPP	*Salix* sp.	willow	3

Code	Scientific Name	Common Name	Cover
Forbs			
EPILANG	*Epilobium angustifolium*	fireweed	2
EQUISYL	*Equisetum sylvaticum*	woodland horsetail	5
LATHOCH	*Lathyrus ochroleucus*	cream-coloured vetchling	1
MAIACAN	*Maianthemum canadense*	wild lily-of-the-valley	1
MERTPAN	*Mertensia paniculata*	tall lungwort	1
Grass			
CALACAN	*Calamagrostis canadensis*	bluejoint	8
CARESIC	*Carex siccata*	hay sedge	0.5
Moss			
DICRSPP	*Dicranum* sp.	dicranum	0.5
MOSSSPP	*Unnamed moss species*	unidentified moss	5
PLEUSCH	*Pleurozium schreberi*	Schreber's moss	2
POLYPIL	*Polytrichum piliferum*	awned hair-cap	3
POLYSTR	*Polytrichum strictum*	slender hair-cap	0.5

Field Guide Classification

Best fit Boreal Mixedwood D2.3 (Aw-Sw/green alder)

This shrub community does not fit very well into the field guide classification. This community appeared to be an early seral stage for a mixedwood community. That is, the community lacked the tree canopy, which identifies a somewhat similar community in the field guide classification.

Discussion

This riparian community was located on the lower slope of a steep eroding, north-facing slope adjacent to a creek, which drains into the Athabasca River. Soil formation appeared to be hindered by the steepness of the slope and the loss of surface stabilizng rooted plants due to burns. An abundance of large diameter deadwood and dead standing trees (appeared to be pine) were present.

A diversity of species was present. Pine was invading from up slope and river alder (*Alnus tenuifolia*) was invading from down-slope along the creek. A narrow band of the Alnu ten / Cala can community paralleled the creek. Woodland horsetail (*Equisetum sylvaticum*) cover was prominent and it had not yet fully emerged. This community appeared to be an early seral stage of a riparian mixedwood community.

Aw / Equi pra
(Aspen / Meadow horsetail)

Location:

Site 1 12V478987 UTM6439365 NAD83

Air photos

Site 1 AS4977 #45-46

Site and Soil

Site

Slope (%)	0
Aspect (°)	
Exposure	not applicable
Flood Hazard	no hazard
Soil Drainage	imperfect
Site-Macro	plain
Site Meso	level
Site Shape	straight
Moisture	mesic
Nutrients	permesotrophic
Site Micro	straight

Soils

Parent Material	glaciofluvial / rock
Surface Expression	level
Soil Subgroup	D.GL
Dominant Texture	SiC
Effective Texture	C
Texture	SiC/SiC

Vegetation

Code	Scientific Name	Common Name	Cover
Main Canopy			
POPUTRE	*Populus tremuloides*	aspen	20
Understory			
BETUNEO	*Betula neoalaskana*	Alaska Birch	3
POPUTRE	*Populus tremuloides*	aspen	40
Tall Shrubs			
BETUNEO	*Betula neoalaskana*	Alaska Birch	10
POPUTRE	*Populus tremuloides*	aspen	20
SALIBEB	*Salix bebbiana*	beaked willow	1
Low Shrubs			
BETUNEO	*Betula neoalaskana*	Alaska Birch	5
PICEGLA	*Picea glauca*	white spruce	8

Code	Scientific Name	Common Name	Cover
POPUTRE	*Populus tremuloides*	aspen	5
ROSAACI	*Rosa acicularis*	prickly rose	3
RUBUPUB	*Rubus pubescens*	dewberry	1
VIBUEDU	*Viburnum edule*	low-bush cranberry	1
Forbs			
ACHIMIL	*Achillea millefolium*	common yarrow	1
ASTECIL	*Aster ciliolatus*	Lindley's aster	1
EPILANG	*Epilobium angustifolium*	fireweed	2
EQUIPRA	*Equisetum pratense*	meadow horsetail	25
FRAGVIR	*Fragaria virginiana*	wild strawberry	1
GALIBOR	*Galium boreale*	northern bedstraw	1
LATHOCH	*Lathyrus ochroleucus*	cream-coloured vetchling	1
MAIACAN	*Maianthemum canadense*	wild lily-of-the-valley	1
MERTPAN	*Mertensia paniculata*	tall lungwort	3
VICIAME	*Vicia americana*	wild vetch	1
Grass			
CALACAN	*Calamagrostis canadensis*	bluejoint	1
CARESIC	*Carex siccata*	hay sedge	0.5
ELYMINN	*Elymus innovatus*	hairy wild rye	1
Moss			
AULAPAL	*Aulacomnium palustre*	tufted moss	0.5
POLYSTR	*Polytrichum strictum*	slender hair-cap	0.5
Litter			
deadfall			30

Field Guide Classification

Boreal Mixedwood D1.8 (Aw/forb) transitional to an E1 (dogwood PB-Aw)

This community appeared to fit in well with the classification system.

Discussion

Parent materials consisted of glaciofluvial sediments over rock. Site 1 was the only site sampled in the park where sand was not the dominant texture in the soil profile. The soil profile consisted of silty clay sediments over clay. The presence of a clay component enhanced the nutrient trapping capability of the soil resulting in permesotrophic nutrient conditions. Dark Gray Luvisolic soil was identified at this site located in relatively close proximity to the Athabasca River. This community was adjacent to a riparian white spruce (*Picea glauca*) community, which was located to the immediate west.

Deadfall cover averaged 30 % and in places was as high as 60 %. The deadfall appeared to be pine. Much of the tree and shrub cover had to grow through and between the deadfall. Increased forb diversity was noted in stand openings, with meadow horsetail (*Equisetum pratense*) and tall lungwort (*Mertensia paniculata*) quite prolific. The high cover of white spruce (*Picea glauca*) regeneration present

would suggest that this community may be a precursor to a white spruce woodland.

Pinu ban – Ledu gro / Poly str
(Jack pine regeneration – Common Labrador Tea / Moss)

Location:

Site 14 12V489247 UTM6448340 NAD 83

Air photos

Site 14 AS4977 #118-119

Site and Soil

Site

Slope (%)	1
Aspect (°)	250
Exposure	frost
Flood Hazard	no hazard
Soil Drainage	rapid
Site-Macro	plain
Site Meso	depression
Site Shape	straight
Moisture	hygric
Nutrients	mesotrophic
Factors	fire
Site Micro	hummocky

Soils

Parent Material	organic blanket / eolian
Surface Expression	level
Texture	Of/S

Vegetation

Code	Scientific Name	Common Name	Cover
Tall Shrubs			
PINUBAN	*Pinus banksiana*	jack pine	3
Low Shrubs			
ALNUCRI	*Alnus crispa*	green alder	2
BETUPUM	*Betula pumila*	dwarf birch	2
CHAMCAL	*Chamaedaphne calyculata*	leatherleaf	2
HUDSTOM	*Hudsonia tomentosa*	sand heather	NV
KALMPOL	*Kalmia polifolia*	northern laurel	5
LEDUGRO	*Ledum groenlandicum*	common Labrador tea	10
PICEMAR	*Picea mariana*	black spruce	1
PINUBAN	*Pinus banksiana*	jack pine	70
VACC MYR	*Vaccinium myrtilloides*	common blueberry	2
VACCVIT	*Vaccinium vitis-idaea*	bog cranberry	2
Grass			

Code	Scientific Name	Common Name	Cover
CALACAN	*Calamagrostis canadensis*	bluejoint	1
Moss			
POLYPIL	*Polytrichum piliferum*	awned hair-cap	NV
POLYSTR	*Polytrichum strictum*	slender hair-cap	40

Field Guide Classification

No similar community was identified in the field guide classification. This community appeared to be in transition from a shrub wetland to a pine woodland.

Discussion

This site was recently burned and also appeared to be impacted by a major decrease in water levels. This area appeared to have been a poor fen at some time in the past. A number of wetland species were present; however, pine regrowth was currently taking over. This community was in a state of flux attributable to changes in site environmental conditions.

(Sali ped) / Care utr
((Bog willow) / Small bottle sedge)

Location:

Site 18 12V486456 UTM6434064 NAD 83

Air photos

Site 18 AS4977 #14-15

Site and Soil

Site	
Slope (%)	0
Aspect (°)	
Exposure	not applicable
Flood Hazard	no hazard
Soil Drainage	Very poor
Site-Macro	plain
Site Meso	level
Site Shape	straight
Moisture	hydric
Nutrients	permesotrophic
Site Micro	straight

Soils	
Parent Material	organic / eolian
Surface Expression	level
Soil Subgroup	TY.M
Texture	Om/S

Vegetation

Code	Scientific Name	Common Name	Cover
Low Shrubs			
BETUPUM	*Betula pumila*	dwarf birch	1
SALIPED	*Salix pedicellaris*	bog willow	4
Forbs			
EQUIFLU	*Equisetum fluviatile*	swamp horsetail	1
PETASAG	*Petasites sagittatus*	arrow-leaved coltsfoot	3
POTEPAL	*Potentilla palustris*	marsh cinquefoil	1
Grass			
CAREUTR	*Carex utriculata*	small-bottle sedge	25

Field Guide Classification

Boreal Mixedwood K3.1 sedge fen

This community fits into the field guide classification system very well.

Discussion

This rich sedge fen community was located in a low-lying area, which contained hygric, permesotrophic conditions. The soil profile indicated that an organic veneer overlay sandy deposits. The site was rich (organic layer pH=7.0, sandy underlying sediment pH=7.5) (Vitt et al. 1998). Standing water accounted for 25 % of the surface cover. Small-bottle sedge (*Carex utriculata*) was the most abundant plant species at the site. Bog willow (*Salix pedicellaris*) appeared to moving inward from the perimeter. The wettest area of the fen was generally defined by sedges, which graded to fen shrub species as one moved away from the wettest point. In this community the willow appeared to have begun to invade the interior of the sedge fen and over time if the drying trend continues this site will become a shrubby fen.

Wood frogs were observed in the reed grass (*Calamagrostis* sp.) along the perimeter of the fen.

RECCOMMENDATIONS

1. No sites were sampled adjacent to the Athabasca River (i.e. river flats and white spruce communities) as they represented only a very small area of the park. However, these communities appear to be unique to the park and it is recommended that they be sampled in any future study.

2. Information regarding the location of sampled sites is noted with the communities. Future studies should focus sampling in different areas in order to obtain a broader distribution of sites. This would assist in determining the distribution of the various communities and also the increased sampling would help to more clearly characterize the communities.

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