Forest / Forêt **Association CNVC00323**

Pinus banksiana – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens)

Jack Pine – Black Spruce / Lingonberry / Red-stemmed Feathermoss (Stairstep Moss)

Pin gris – Épinette noire / Airelle rouge / Pleurozie dorée (Hylocomie brillante)

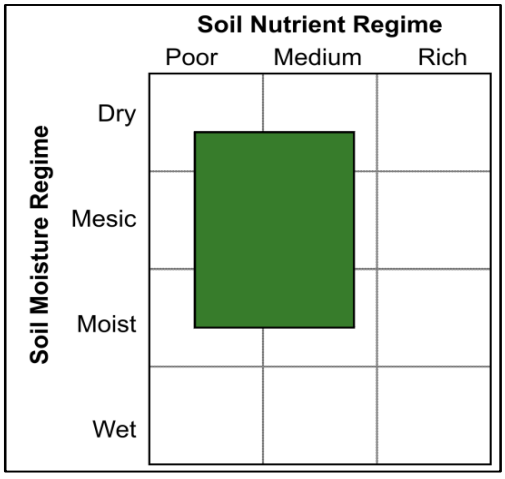
Subassociations: none
CNVC Alliance: CA00021 *Picea mariana – Pinus banksiana / Vaccinium myrtilloides / V. vitis-idaea / Pleurozium schreberi*
CNVC Group: CG0010 Central Boreal Mesic-Moist Black Spruce – Jack Pine Forest

Type Description

Concept: CNVC00323 is a boreal coniferous forest Association that ranges from Alberta to Manitoba. It has a moderately closed canopy of jack pine (*Pinus banksiana*) and/or black spruce (*Picea mariana*), usually with jack pine dominant. The shrub layer is usually moderately developed and typically includes the heath species common Labrador tea (*Rhododendron groenlandicum*) and velvet-leaved blueberry (*Vaccinium myrtilloides*), as well as regenerating black spruce. Lingonberry (*V. vitis-idaea*), bunchberry (*Cornus canadensis*) and twinflower (*Linnaea borealis*) are common in the moderately developed herb and dwarf shrub layer. A well-developed moss layer dominated by red-stemmed feathermoss (*Pleurozium schreberi*), with lower abundance of stairstep moss (*Hylocomium splendens*), further characterizes this Association. Patches of green reindeer lichen (*Cladina mitis*) are usually present. CNVC00323 occurs on mesic, nutrient-poor to medium sites in a region with a subhumid continental boreal climate. It typically establishes as the first cohort after fire.

Vegetation: CNVC00323 is a coniferous forest Association with a moderately closed canopy of *Pinus banksiana* and/or *Picea mariana*. *P. banksiana* is usually dominant but *P. mariana* can be the leading species, particularly on moister sites. The shrub layer is usually moderately developed but can vary from sparse to dense depending on the patchiness of shrubs. Heath species, including *Rhododendron groenlandicum* and *Vaccinium myrtilloides,* and regenerating *P. mariana* usually dominate the shrub layer, but *Alnus viridis* can be abundant where present. The moderately developed herb and dwarf shrub layer typically includes *V. vitis-idaea*, *Cornus canadensis* and *Linnaea borealis*. The moss layer is well developed and dominated by *Pleurozium schreberi* with lower abundance of *Hylocomium splendens.* Patches of *Cladina mitis* are often present on drier microsites.

Environment: CNVC00323 occurs in a subhumid continental boreal climate where the regional fire cycle is intermediate (100-270 years). It is most frequently found on mesic, nutrient-poor to medium sites, although moisture status varies from dry to moist. Stands are usually on level sites or gentle slopes and occur more frequently on water-shedding, crest or upper to middle-slope topopositions. Soils are often deep, but textures are variable. Parent materials are commonly morainal, glaciofluvial or fluvial, although these too are variable. Mor humus forms are common.



Pinus banksiana – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens) CNVC00323

Type Description (cont'd)

Dynamics: CNVC00323 is naturally perpetuated by stand-replacing fire. Stands commonly comprise both *Pinus banksiana* and *Picea mariana*. Both of these species rarely survive fire but have cones that open when heated to disperse seeds. Seedbeds are usually improved by a fire that reduces the organic matter thickness and exposes mineral soil. Fire can also reduce competing vegetation and help to release nutrients from the organic matter. Maximum seed release can therefore coincide with optimal conditions for seedling establishment, survival and growth of both species.

P. banksiana grows more rapidly than *P. mariana* so usually dominates the initial stand with *P. mariana* in the understory or subcanopy. *P. mariana* is longer lived, more shade tolerant and better able to regenerate in the absence of fire, so it can become dominant on these sites over time, forming CNVC00128 [*Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens)*].

Jack pine budworm (*Choristoneura pinus pinus*) can reduce growth and cause top kill of *P. banksiana* but does not usually result in widespread tree mortality. Dead wood and needle litter may increase the flammability of these stands after an outbreak.

Mountain pine beetle (*Dendroctonus ponderosae*) is a significant pest of *Pinus contorta* var. *latifolia* west of the range of CNVC00323. The insect's range has been extending northward and eastward into the boreal region, and stands of *P. banksiana* may be at risk.

Range: CNVC00323 occurs on the boreal plains of west-central Canada, from northwestern Alberta to western Manitoba.

Conservation Status (NatureServe)

Global Conservation Rank: no applicable rank
National Conservation Rank: not yet determined
Subnational Conservation Rank: not yet determined

Forest / Forêt **Association CNVC00323**

Pinus banksiana – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens)

Jack Pine – Black Spruce / Lingonberry / Red-stemmed Feathermoss (Stairstep Moss)

Pin gris – Épinette noire / Airelle rouge / Pleurozie dorée (Hylocomie brillante)

Distribution

Countries: Canada

Provinces / Territories / States: Alberta, Manitoba, Saskatchewan

Terrestrial Ecozones and Ecoregions of Canada: Boreal Plains: Mid-Boreal Lowland, Mid-Boreal Uplands, Peace Lowland, Wabasca Lowland; Taiga Plains: Northern Alberta Uplands

Rowe's Forest Regions and Sections of Canada: Boreal: Hay River, Manitoba Lowlands, Mixedwood, Upper Churchill, Upper Mackenzie

NAAEC CEC Ecoregions of North America (Levels I & II): Northern Forests: Boreal Plains; Taiga: Taiga Plains

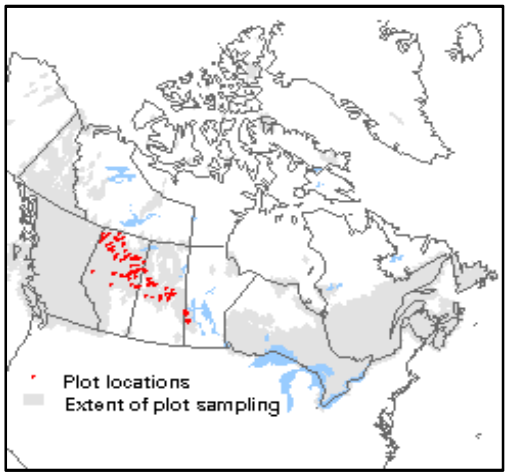
Nature Conservancy of Canada Ecoregions: Boreal Plains, Taiga Plains

Natural Regions and Subregions of Alberta: Boreal Forest: Central Mixedwood, Dry Mixedwood, Lower Boreal Highlands, Northern Mixedwood, Upper Boreal Highlands

Ecozones and Ecoregions of Saskatchewan: Boreal Plain: Mid-Boreal Lowland, Mid-Boreal Upland

Ecozones and Ecoregions of Manitoba: Boreal Plains

Manitoba Protected Areas Initiative Natural Regions: Manitoba Lowlands, Western Upland



Corresponding Types and Associations

CNVC00323	Alberta	NN/BH/C/01/01	Pj - Sb / Labrador tea / feather moss
		NN/BH/C/01/02	Pj - Sb / feather moss
		NN/BM/C/01/01	Pj - Sb / Labrador tea / feather moss
		NN/BM/C/01/02	Pj - Sb / green alder / feather moss
		NN/BM/C/01/03	Pj - Sb / feather moss
		NN/SB/C/01/01	Pl - Sb / Labrador tea / feather moss
	Saskatchewan	BP12	Jack pine - spruce / feathermoss: Fresh loamy sand

Forest / Forêt **Association CNVC00323**

Pinus banksiana – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens)

Jack Pine – Black Spruce / Lingonberry / Red-stemmed Feathermoss (Stairstep Moss)

Pin gris – Épinette noire / Airelle rouge / Pleurozie dorée (Hylocomie brillante)

Vegetation Summary*

	Association CNVC00323 95 plots	
Species Name[T]	% Cover[±]	% Presence[^]
Overstory Trees		
Pinus banksiana	**32**	**89**
Picea mariana	**20**	**79**
Populus tremuloides	6	31
Picea glauca	13	21
Tree Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(19 30 48 63 81)**	
Understory Woody Shrubs and Regenerating Trees		
Rhododendron groenlandicum	15	75
Picea mariana	9	72
Vaccinium myrtilloides	9	68
Rosa acicularis	3	51
Alnus viridis	11	26
Populus tremuloides	1	23
Picea glauca	5	21
Viburnum edule	2	21
Shrub Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(6 11 31 49 66)**	
Understory Herbs and Dwarf Shrubs		
Vaccinium vitis-idaea	**10**	**86**
Cornus canadensis	6	72
Linnaea borealis	3	62
Chamerion angustifolium	2	36
Geocaulon lividum	2	35
Equisetum sylvaticum	2	34
Leymus innovatus	4	33
Maianthemum canadense	3	28
Lycopodium annotinum	9	26
Petasites frigidus	2	23
Herb Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(3 6 24 32 61)**	
Bryophytes and Lichens		
Pleurozium schreberi	**43**	**99**
Hylocomium splendens	**18**	**78**
Cladina mitis	9	61
Ptilium crista-castrensis	10	55
Cladonia sp.	3	54

Pinus banksiana – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens) CNVC00323

Vegetation Summary (cont'd)*

	Association CNVC00323	
Species Name[†]	% Cover[±]	% Presence[^]
Peltigera aphthosa	1	49
Dicranum polysetum	2	39
Dicranum sp.	1	24
Ptilidium pulcherrimum	1	21
Evernia mesomorpha	1	21
Bryo-Lichen Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(29 53 74 98 100)**	

* species present in > 20% of sample plots are listed

[†] see **Botanical Nomenclature** link at http://cnvc-cnvc.ca for botanical sources, synonyms and common names

[±] average percent cover of a species within the plots in which it occurs (i.e., characteristic cover)

[^] percent frequency occurrence for a species within the total plots

[‡] $P_x = X^{th}$ percentile (e.g., $P_{10} = 10^{th}$ percentile)

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Forest / Forêt **Association CNVC00323**

Pinus banksiana – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens)

Jack Pine – Black Spruce / Lingonberry / Red-stemmed Feathermoss (Stairstep Moss)

Pin gris – Épinette noire / Airelle rouge / Pleurozie dorée (Hylocomie brillante)

Site / Soil Characteristics

	Association CNVC00323 **95 plots**
Elevation Range (min–mean–max meters)	
	242–555–975
	missing data (13)
Slope Gradient (% frequency)	
	moderately steep (1)
	moderate (6)
	gentle (13)
	level (76)
	missing data (4)
Aspect (% frequency)	
	north (18)
	east (12)
	south (15)
	west (19)
	level (31)
	missing data (6)
Meso Topoposition (% frequency)	
	crest / upper (29)
	mid (24)
	lower / toe (4)
	level (35)
	missing data (7)
Moisture Regime (% frequency)	
	dry (18)
	mesic (56)
	moist (26)
Nutrient Regime (% frequency)	
	poor (54)
	medium (15)
	rich (1)
	missing data (31)

Pinus banksiana – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens) CNVC00323

Site / Soil Characteristics (cont'd)

	Association CNVC00323
Soil Parent Material (% frequency)	
	eolian (3)
	moraine / till (43)
	fluvial (23)
	glaciofluvial (16)
	lacustrine (7)
	glaciolacustrine (6)
	missing data (1)
Soil Rooting Zone Substrate (% frequency)	
	sandy (16)
	coarse loamy (8)
	fine loamy (17)
	silty (1)
	clayey (9)
	missing data (48)
Root Restricting Depth (% frequency)	
	21 – 99 cm (1)
	≥ 100 cm (27)
	missing data (72)
Humus Form (% frequency)	
	mor (62)
	peatymor (3)
	missing data (35)

Forest / Forêt **Association CNVC00323**

Pinus banksiana – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens)

Jack Pine – Black Spruce / Lingonberry / Red-stemmed Feathermoss (Stairstep Moss)

Pin gris – Épinette noire / Airelle rouge / Pleurozie dorée (Hylocomie brillante)

Additional Characteristics

Species of High Conservation Concern:

Non-native Species:

Management Issues:

Type Statistics

Internal Similarity: **Confidence:**

Strength:

Related Concepts

Similar CNVC Associations:

CNVC00120 [*Pinus contorta – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi*] occurs on comparable boreal and foothills sites in western Alberta and northern British Columbia. It has dominance of *Pinus contorta* var. *latifolia* (see Comments).

CNVC00127 [*Pinus banksiana / Vaccinium myrtilloides / Arctostaphylos uva-ursi / Cladina* spp.] occurs on drier, poorer sites in the same range and has a more open tree layer and a moss layer with lower cover of feathermosses and more of *Cladina* lichens.

CNVC00128 [*Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens)*] typically occurs on moister sites in the same range and is dominated by *Picea mariana*, rather than *Pinus banksiana* (see Dynamics).

CNVC00248 [*Pinus banksiana (Picea mariana) / Vaccinium myrtilloides / Pleurozium schreberi*] occurs on slightly poorer sites in the same range. It has a less developed herb and dwarf shrub layer with lower herb diversity and greater cover of *Hylocomium splendens* in the moss layer.

CNVC00249 [*Picea mariana (Pinus banksiana) / Vaccinium myrtilloides / Pleurozium schreberi*] occurs on the Precambrian Shield from Alberta to northwestern Ontario on comparable sites. It has *Picea mariana* dominant and lower herb diversity because of the lower nutrient status of Shield soils.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

In southwestern Manitoba, CNVC00323 partially matches the concepts of ES13 [Jack Pine - Black Spruce - Feathermoss on Dry to Fresh Sandy Soil], ES24 [Jack Pine - Black Spruce - Mixedwood on Fresh Coarse Loamy to Silty Soil] and ES36 [Black Spruce - Jack Pine - Feathermoss on Fresh Fine Loamy Soil] in Arnup et al. 2006.

Comments

Where CNVC00323 occurs at higher elevations (i.e., above 650 mASL) in northern Alberta, *Pinus banksiana* may form fertile hybrids with *P. contorta* var. *latifolia* that are recognized by intermediate cone characters; ecologically, the hybrid pine (*P. x murraybanksiana*) occupies comparable sites. Stands containing hybrid pine with similar understories on comparable sites are classified as CNVC00323 in northeastern Alberta (e.g., Birch Mountains). Such stands at higher elevations in the Caribou Mountains and west are classified as CNVC00120 [*Pinus contorta – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi*].

Pinus banksiana – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens) CNVC00323

Source Information

Number of source plots for CNVC00323: 95
Information Sources:

Alberta Environment and Parks. 2014. Ecological Site Information System (ESIS). Govt. AB, Edmonton, AB.

McLaughlan, M.S.; Wright, R.A.; Jiricka, R.D. 2010. Saskatchewan forest ecosystem classification [data set]. Sask. Min. Environ. For. Serv., Prince Albert, SK.

Concept Authors: L. Allen, K. Baldwin, K. Chapman, M. McLaughlan
Description Authors: K. Baldwin and K. Chapman
Date of Concept: November, 2011
Date of Description: March, 2016

Classification References:

Beckingham, J.D.; Archibald, J.H. 1996. Field guide to ecosites of northern Alberta. Nat. Resour. Can., Can. For. Serv., North. For. Cent., Edmonton, AB. Spec. Rep. 5.

McLaughlan, M.S.; Wright, R.A.; Jiricka, R.D. 2010. Field guide to the ecosites of Saskatchewan's provincial forests. Sask. Min. Environ., For. Serv., Prince Albert, SK.

Characterization References:

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Kenkel, N.C.; Walker, D.J.; Watson, P.R.; Caners, R.T; Lastra, R.A. 1997. Vegetation dynamics in boreal forest ecosystems. Coenoses 12(2-3):97-108.

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Pinus banksiana – Picea mariana / Vaccinium vitis-idaea / Pleurozium schreberi (Hylocomium splendens) CNVC00323

Characterization References (cont'd):

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The information contained in this factsheet is based on data and expert knowledge that is current to the date of description. As new information becomes available, the factsheet will be updated.

For more information about the contents of this factsheet and definitions of attribute names and data classes, see the **Understanding the Factsheet** link at http//cnvc-cnvc.ca.

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