



Canadian National Vegetation Classification (CNVC)
 Classification nationale de la végétation du Canada (CNVC)

<http://cnvc-cnvc.ca>

Forest / Forêt

Association CNVC00104

Picea glauca* (*Pinus contorta*) / *Shepherdia canadensis* / *Leymus innovatus* / *Hylocomium splendens

White Spruce (Lodgepole Pine) / Soapberry / Downy Lyme grass / Stairstep Moss

Épinette blanche (Pin tordu) / Shépherdie du Canada / Élyme innovant / Hylocomie brillante

Subassociations: none

CNVC Alliance: CA00033 *Pinus contorta* – *Picea glauca* / *Shepherdia canadensis* / *Leymus innovatus*

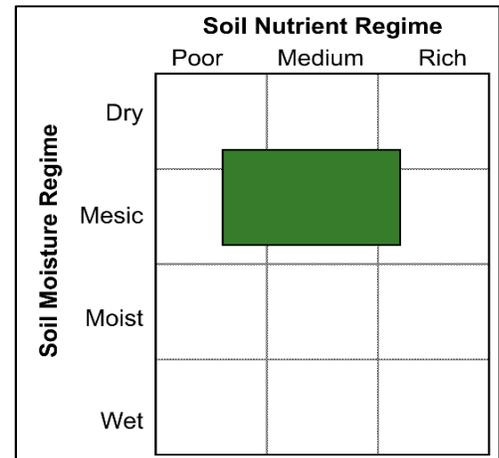
CNVC Group: CG0014 Cordilleran Boreal Mesic Trembling Aspen – White Spruce Forest

Type Description

Concept: CNVC00104 is a boreal coniferous forest Association that occurs in Alberta and British Columbia. It has an open canopy that is dominated by white spruce (*Picea glauca*), often mixed with lodgepole pine (*Pinus contorta*). The moderately developed shrub layer typically includes prickly rose (*Rosa acicularis*), soapberry (*Shepherdia canadensis*), squashberry (*Viburnum edule*) and regenerating white spruce. The herb and dwarf shrub layer is well developed and characterized by abundant downy lyme grass (*Leymus innovatus*), usually accompanied by twinflower (*Linnaea borealis*), one-sided wintergreen (*Orthilia secunda*), fireweed (*Chamerion angustifolium*) and bunchberry (*Cornus canadensis*). A well-developed moss layer dominated by stairstep moss (*Hylocomium splendens*), with lower cover of red-stemmed feathermoss (*Pleurozium schreberi*) and knight's plume moss (*Ptilium crista-castrensis*), further characterizes this Association. CNVC00104 occurs mainly on mesic, nutrient-medium sites in a region with a subhumid continental climate. It is typically a late successional condition that occurs in areas that have escaped fire for a long period, however it can sometimes form the first cohort after fire.

Vegetation: CNVC00104 is a coniferous forest Association with an open canopy that is dominated by *Picea glauca*, often mixed with *Pinus contorta* (see Comments). *Populus tremuloides* may be a minor canopy associate. The shrub layer is usually moderately developed and typically includes *Rosa acicularis*, *Shepherdia canadensis*, *Viburnum edule* and regenerating *P. glauca*. The herb and dwarf shrub layer is typically well developed and characterized by abundant *Leymus innovatus*. This layer also includes low cover of several other species such as *Linnaea borealis*, *Orthilia secunda*, *Chamerion angustifolium* and *Cornus canadensis*. The well-developed moss layer is dominated by *Hylocomium splendens* with lower cover of *Pleurozium schreberi* and *Ptilium crista-castrensis*.

Environment: CNVC00104 occurs in a subhumid continental climate where regional fire cycles are short (<100 years) or intermediate (100-270 years). It is primarily found on mesic, nutrient-medium to poor sites. Slope gradient and topoposition are variable, but stands are frequently on warmer (often drier), south or west-facing aspects. Soils vary in texture because they are derived from a wide range of parent materials. Humus forms are primarily mors, but compared to other boreal Associations, moders are relatively frequent.





***Picea glauca* (*Pinus contorta*) / *Shepherdia canadensis* / *Leymus innovatus* / *Hylocomium splendens* CNVC00104**

Type Description (cont'd)

Dynamics: CNVC00104 can sometimes recolonize after fire, but typically it succeeds earlier seral Associations in which pioneer species are dominant. After stand-replacing disturbance (especially fire), *Picea glauca* is usually eliminated. *Populus tremuloides* and/or *Pinus contorta* are likely to form the initial stand on these sites because they are adapted to disturbance (e.g., CNVC00087 [*Populus tremuloides* / *Leymus innovatus*] or CNVC00121 [*Pinus contorta* / *Shepherdia canadensis* / *Leymus innovatus*]). *P. glauca* becomes established in these early seral stands over time when seeds are disseminated from nearby sources. Since *P. glauca* grows more slowly, it usually requires several decades to attain canopy height; the stand is likely to attain *P. glauca* dominance after 100 years or more without fire. CNVC00091 [*Populus tremuloides* – *Picea glauca* – *Pinus contorta* / *Leymus innovatus*] can represent a mid-successional condition for this series, but both it and CNVC00104 can also develop immediately after fire if there is a *P. glauca* seed source.

Pinus contorta and *P. glauca* establishment are best where mineral soil has been exposed following a severe fire. Poor establishment on these slightly drier sites and/or disturbances such as insect outbreak, or improperly planned timber harvesting and post-harvest treatments, can result in reduced *P. contorta* and *P. glauca* canopy cover, and either a sparse forest condition or an increased proportion of *P. tremuloides* in the canopy.

Range: CNVC00104 occurs in the Rocky Mountain foothills of Alberta and the boreal plains of British Columbia.

Conservation Status (NatureServe)

Global Conservation Rank: no applicable rank

National Conservation Rank: not yet determined

Subnational Conservation Rank: not yet determined



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Distribution

Countries: Canada

Provinces / Territories / States: Alberta, British Columbia

Terrestrial Ecozones and Ecoregions of Canada: Boreal Cordillera: Boreal Mountains and Plateaus, Hyland Highland, Liard Basin, Northern Canadian Rocky Mountains; Boreal Plains: Clear Hills Upland, Muskwa Plateau, Peace Lowland, Western Alberta Upland; Montane Cordillera: Central Canadian Rocky Mountains

Rowe's Forest Regions and Sections of Canada: Boreal: Lower Foothills, Mixedwood, Northern Foothills, Stikine Plateau, Upper Foothills, Upper Liard

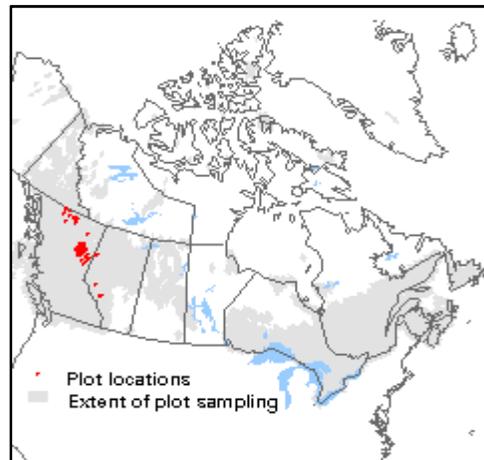
NAAEC CEC Ecoregions of North America (Levels I & II): Northern Forests: Boreal Plains; Northwestern Forested Mountains: Boreal Cordillera, Western Cordillera

Nature Conservancy of Canada Ecoregions: Boreal Plains, Central Interior, Muskwa - Kechika

Biogeoclimatic Ecosystem Classification of British Columbia (zones and subzones): BWBSmk, BWBSmw, BWBSwk

British Columbia Ecoregion Classification (ecoregions): Boreal Mountains and Plateaus, Central Alberta Uplands, Central Canadian Rocky Mountains, Hay-Slave Lowland, Hyland Highland, Liard Basin, Muskwa Plateau, Northern Canadian Rocky Mountains, Peace River Basin, Southern Alberta Upland

Natural Regions and Subregions of Alberta: Boreal Forest: Lower Boreal Highlands; Foothills: Lower Foothills, Upper Foothills



Corresponding Types and Associations



CNVC00104	British Columbia	BWBSmk /103	<i>Picea glauca</i> – <i>Pinus contorta</i> – <i>Shepherdia canadensis</i> – <i>Leymus innovatus</i>
		BWBSmw /103	<i>Picea glauca</i> – <i>Pinus contorta</i> – <i>Shepherdia canadensis</i> – <i>Leymus innovatus</i>
		BWBSwk 2 /103	<i>Picea glauca</i> – <i>Pinus contorta</i> – <i>Shepherdia canadensis</i> – <i>Leymus innovatus</i>
	Alberta	WC/LF/C/04/01	Sw / Canada buffalo-berry / hairy wild rye
		WC/UF/C/04/01	Sw / Canada buffalo-berry / hairy wild rye



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Vegetation Summary*

Species Name [†]	Association CNVC00104 60 plots	
	% Cover [‡]	% Presence [^]
Overstory Trees		
<i>Picea glauca</i>	22	92
<i>Pinus contorta</i>	16	62
<i>Populus tremuloides</i>	5	53
Tree Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(20 25 33 40 46)	
Understory Woody Shrubs and Regenerating Trees		
<i>Rosa acicularis</i>	5	87
<i>Shepherdia canadensis</i>	7	83
<i>Picea glauca</i>	6	73
<i>Viburnum edule</i>	4	60
<i>Populus tremuloides</i>	2	47
<i>Alnus viridis</i>	7	32
<i>Juniperus communis</i>	2	28
<i>Amelanchier alnifolia</i>	1	28
<i>Salix scouleriana</i>	3	23
Shrub Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(10 15 26 35 45)	
Understory Herbs and Dwarf Shrubs		
<i>Leymus innovatus</i>	21	100
<i>Linnaea borealis</i>	7	95
<i>Orthilia secunda</i>	1	78
<i>Chamerion angustifolium</i>	2	77
<i>Cornus canadensis</i>	8	65
<i>Mertensia paniculata</i>	2	57
<i>Lathyrus ochroleucus</i>	2	52
<i>Pyrola asarifolia</i>	1	50
<i>Galium boreale</i>	1	45
<i>Vaccinium vitis-idaea</i>	8	43
<i>Fragaria virginiana</i>	1	43
<i>Arnica cordifolia</i>	2	38
<i>Rubus pubescens</i>	2	38
<i>Eurybia conspicua</i>	2	37
<i>Geocaulon lividum</i>	2	33
<i>Petasites frigidus</i>	2	33
<i>Goodyera repens</i>	< 1	28
<i>Maianthemum canadense</i>	2	27
<i>Mitella nuda</i>	1	25



***Picea glauca (Pinus contorta) / Shepherdia canadensis / Leymus innovatus / Hylocomium splendens* CNVC00104**

Vegetation Summary (cont'd)*

Species Name [†]	Association CNVC00104	
	% Cover [‡]	% Presence [^]
<i>Pyrola chlorantha</i>	1	25
<i>Arctostaphylos uva-ursi</i>	6	23
<i>Vaccinium caespitosum</i>	2	22
<i>Symphotrichum ciliolatum</i>	1	22
<i>Achillea millefolium</i>	< 1	22
Herb Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(20 25 44 60 75)	
Bryophytes and Lichens		
<i>Hylocomium splendens</i>	51	93
<i>Pleurozium schreberi</i>	23	78
<i>Ptilium crista-castrensis</i>	8	60
<i>Peltigera aphthosa</i>	2	53
Bryo-Lichen Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(34 59 73 94 99)	

* 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 = Xth percentile (e.g., P₁₀ = 10th percentile)



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Site / Soil Characteristics

Association

CNVC00104

60 plots

Elevation Range (min–mean–max meters)

505–870–1390

Slope Gradient (% frequency)

very steep (2)
 steep (13)
 moderately steep (15)
 moderate (10)
 gentle (22)
level (35)
 missing data (3)

Aspect (% frequency)

north (13)
 east (8)
south (28)
 west (27)
 level (22)
 missing data (2)

Meso Toposition (% frequency)

crest / upper (25)
mid (32)
 lower / toe (13)
 level (23)
 missing data (7)

Moisture Regime (% frequency)

dry (13)
mesic (82)
 moist (2)
 missing data (3)

Nutrient Regime (% frequency)

poor (25)
medium (57)
 rich (13)
 missing data (5)



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Site / Soil Characteristics (cont'd)

Association
CNVC00104

Soil Parent Material (% frequency)

colluvium (8)
eolian (5)
moraine / till (17)
fluvial (12)
glaciofluvial (10)
lacustrine (3)
glaciolacustrine (3)
missing data (42)

Soil Rooting Zone Substrate (% frequency)

non-soil (8)
sandy (15)
coarse loamy (27)
fine loamy (13)
silty (2)
clayey (20)
missing data (15)

Root Restricting Depth (% frequency)

0 – 20 cm (2)
21 – 99 cm (7)
≥ 100 cm (13)
missing data (78)

Humus Form (% frequency)

mor (57)
moder (17)
missing data (27)



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Additional Characteristics

Species of High Conservation Concern:

Non-native Species:

Management Issues:

Type Statistics

Internal Similarity:

Confidence:

Strength:

Related Concepts

Similar CNVC Associations:

CNVC00091 [*Populus tremuloides* – *Picea glauca* – *Pinus contorta* / *Leymus innovatus*] is a similar mixedwood Association that occurs on comparable boreal sites in the same range (see Dynamics).

CNVC00102 [*Picea glauca* / *Rosa acicularis* / *Hylocomium splendens*] occurs on moister sites in the same range. It has greater canopy closure and much less *Leymus innovatus* in the understory.

CNVC00119 [*Pinus contorta* (*Picea glauca*) / *Shepherdia canadensis* / *Geocaulon lividum* / *Pleurozium schreberi*] occurs on comparable boreal sites in British Columbia and Yukon. It is *Pinus contorta* rather than *Picea glauca*-dominated, has a herb and dwarf shrub layer with much less *Leymus innovatus* and greater constancy and cover of *Geocaulon lividum*.

CNVC00121 [*Pinus contorta* / *Shepherdia canadensis* / *Leymus innovatus*] occurs on similar boreal sites in the same range but is dominated by *Pinus contorta* rather than *Picea glauca* (see Dynamics).

CNVC00337 [*Picea glauca* (*Pinus contorta*) / *Arctostaphylos uva-ursi* – *Leymus innovatus*] occurs on drier sites farther south in the Rocky Mountain foothills of Alberta. It has shrub layers with greater *Dasiphora fruticosa*, *Juniperus communis*, *J. horizontalis* and *Arctostaphylos uva-ursi* and much less *Rosa acicularis* and *Viburnum edule*.

CNVC00384 [*Pinus contorta* / *Shepherdia canadensis*] occurs on comparable boreal sites in Yukon but is dominated by *Pinus contorta* rather than *Picea glauca* and lacks *Leymus innovatus* in the herb and dwarf shrub layer.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

Comments

Pinus contorta here refers to var. *latifolia* (lodgepole pine).



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Source Information

Number of source plots for CNVC00104: 60

Information Sources:

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

Biogeoclimatic Ecosystem Classification Program of British Columbia. 2011. BECMaster ecosystem plot database [VPro13/MSAccess 2010 format]. W.H. MacKenzie (ed.) B.C. Min. For., Lands, and Nat. Res. Ops., Smithers, BC. Available: www.for.gov.bc.ca/hre/becweb/resources/information-requests (accessed: June 2015).

Concept Authors: L. Allen, J. Archibald, K. Baldwin, K. Chapman, W. MacKenzie, D. Meidinger

Description Authors: D. Downing, K. Baldwin and K. Chapman

Date of Concept: March, 2012

Date of Description: November, 2017

Classification References:

Beckingham, J.D.; Corns, I.G.W.; Archibald, J.H. 1996. Field guide to ecosites of west-central Alberta. Nat. Resour. Can., Can. For. Serv., North. For. Cent., Edmonton, AB. Spec. Rep. 9.

DeLong, C.; Banner, A.; MacKenzie, W.H.; Rogers, B.J.; Kaytor, B. 2011. A field guide to ecosystem identification for the Boreal White and Black Spruce zone of British Columbia. B.C. Min. For. Range, For. Sci. Prog., Victoria, BC. Land Manage. Handb. No. 65.

Characterization References:

Abrahamson, I. 2015. *Picea glauca*. In: Fire Effects Information System. U.S. Dept. Agric., For. Serv., Rocky Mt. Res. Stn., Fire Sci. Lab., Missoula, MT, US. Available: <http://www.fs.fed.us/database/feis/plants/tree/picgla/all.html> (accessed: October 2, 2015).

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Anderson, M.D. 2003. *Pinus contorta* var. *latifolia*. In: Fire Effects Information System. U.S. Dept. Agric., For. Serv., Rocky Mt. Res. Stn., Fire Sci. Lab., Missoula, MT, US. Available: <http://www.fs.fed.us/database/feis/plants/tree/pinconl/all.html> (accessed: August 13, 2015).

Andison, D.W. 1998. Temporal patterns of age-class distributions on foothills landscapes in Alberta. *Ecography* 21(5):543-550.

Bergeron, Y.; Chen, H.Y.H.; Kenkel, N.C.; Leduc, A.; Macdonald, S.E. 2014. Boreal mixedwood stand dynamics: ecological processes underlying multiple pathways. *For. Chron.* 90(2):202-213.

Boulanger, Y.; Gauthier, S.; Burton, P.J. 2014. A refinement of models projecting future Canadian fire regimes using homogeneous fire regime zones. *Can. J. For. Res.* 44(4):365-376.

Greene, D.F.; Zasada, J.C.; Sirois, L.; Kneeshaw, D.; Morin, H.; Charron, I.; Simard, M.J. 1999. A review of the regeneration dynamics of North American boreal forest tree species. *Can. J. For. Res.* 29:824-839.

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.

Peters, V.S.; Macdonald, E.; Dale, M.R.T. 2006. Patterns of initial versus delayed regeneration of white spruce in boreal mixedwood succession. *Can. J. For. Res.* 36:1597-1609.

Safranyik, L.; Wilson, B. (eds.). 2006. The mountain pine beetle: a synthesis of biology, management and impacts on lodgepole pine. Pac. For. Centre, Can. For. Serv., Nat. Resour. Can., Victoria, BC.

Stockdale, C. 2014. Fire regimes of western boreal Canada and the foothills of Alberta. A discussion document and literature review for the LANDWEB Project.



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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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