



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

<http://cnvc-cnvc.ca>

Forest / Forêt

Association CNVC00110

Picea mariana* – *P. glauca* / *Mertensia paniculata* / *Hylocomium splendens

Black Spruce – White Spruce / Tall Bluebells / Stairstep Moss

Épinette noire – Épinette blanche / Mertensie paniculée / Hylocomie brillante

Subassociations: none

CNVC Alliance: CA00031 *Picea glauca* – *P. mariana* / *Mertensia paniculata* / *Hylocomium splendens*

CNVC Group: CG0013 Cordilleran Boreal Mesic-Moist Black Spruce – Lodgepole Pine Forest

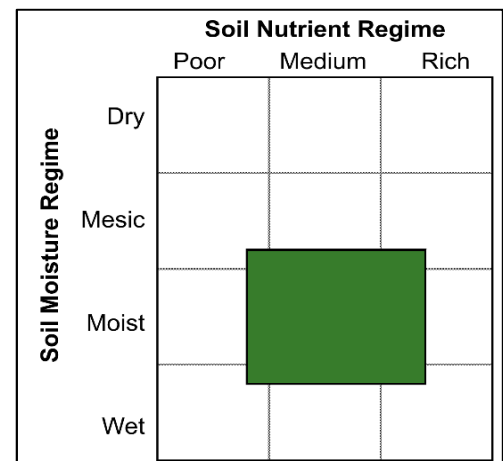
Type Description

Concept: CNVC00110 is a boreal coniferous forest Association that occurs in Alberta, Yukon and likely British Columbia. It has a moderately closed canopy comprising roughly equal proportions of black spruce (*Picea mariana*) and white spruce (*P. glauca*). Prickly rose (*Rosa acicularis*) and common Labrador tea (*Rhododendron groenlandicum*) typically occur in the moderately developed shrub layer. The herb and dwarf shrub layer is usually moderately developed and often consists of low abundance of many species, such as twinflower (*Linnaea borealis*), bunchberry (*Cornus canadensis*), tall bluebells (*Mertensia paniculata*), lingonberry (*Vaccinium vitis-idaea*), arctic sweet coltsfoot (*Petasites frigidus*), naked mitrewort (*Mitella nuda*) and dwarf scouring-rush (*Equisetum scirpoides*). The moss layer is continuous, consisting mainly of stairstep moss (*Hylocomium splendens*). CNVC00110 occurs in a region with a subhumid continental climate, primarily on moist, nutrient-medium sites. Stands typically establish following fire or harvesting, and are self-replacing over time.

Vegetation: CNVC00110 is a coniferous forest Association with a moderately closed canopy codominated by *Picea mariana* and *P. glauca*. The shrub layer is moderately developed and usually includes *Rosa acicularis* and *Rhododendron groenlandicum*, which can be abundant when present. The moderately developed herb and dwarf shrub layer typically has low cover of a number of species such as *Linnaea borealis*, *Cornus canadensis*, *Mertensia paniculata*, *Vaccinium vitis-idaea*, *Petasites frigidus*, *Mitella nuda* and *Equisetum scirpoides*. The continuous moss layer is dominated by *Hylocomium splendens*; *Pleurozium schreberi* and *Ptilium crista-castrensis* are less constant, but sometimes abundant.

Environment: CNVC00110 occurs in a subhumid continental boreal climate. It typically occupies the ecotone between upland and wetland forests on moist, nutrient-medium sites. Stands are usually small in extent and are often found on middle to lower or toe-slope topositions. Stands also occur on level sites on stream terraces and along pond shorelines. Sites are usually imperfectly or poorly drained, with fine-textured soils (fine loams or clays) developed in morainal, eolian, (glacio)fluvial and (glacio)lacustrine parent materials. Mor humus forms are typical.

Within the range of CNVC00110 regional fire cycles are short (<100 years) or intermediate (100-270 years). However, these stands often occur where there are natural fire breaks (e.g., water bodies) and may be less prone to fire than the surrounding landscape because of their moisture status.





***Picea mariana* – *P. glauca* / *Mertensia paniculata* / *Hylocomium splendens* CNVC00110**

Type Description (cont'd)

Dynamics: CNVC00110 is a self-perpetuating condition that is usually initiated by stand-replacing fire. Both *Picea* species have thin bark and rarely survive even low-severity fires. *P. mariana* has semi-serotinous cones that open when heated to disperse seeds. Its seeds can germinate on a variety of substrates, and 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 for *P. mariana* can therefore coincide with optimal conditions for seedling establishment, survival and growth. *P. glauca* becomes established in these stands when seeds are disseminated from nearby sources, either immediately post-fire or by ingress into the stand over time. Both *Picea* species are tolerant of shade and able to self-replace once established in a stand. Over time, stands develop a multilayered canopy through understory regeneration. At higher elevations and latitudes, where a seed source is present, ingress of the highly shade tolerant *Abies lasiocarpa* (see Comments) may also occur.

These sites are susceptible to water table fluctuations (either by anthropogenic activities or natural causes [e.g., beaver dams]). A rise in the water table could result in tree mortality and transition to open wetland vegetation. After disturbance, rapid growth of early successional shrub and grass species can compete with regenerating conifers on these sites and delay stand re-establishment. This can be particularly problematic after harvesting when tree removal can contribute to a rise in the water table by reducing evapotranspiration.

Range: CNVC00110 occurs in the boreal regions of Alberta and Yukon as well as the Rocky Mountain foothills of Alberta. It likely also occurs in 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, Yukon

Terrestrial Ecozones and Ecoregions of Canada: Boreal Cordillera: Hyland Highland, Liard Basin; Boreal Plains: Mid-Boreal Uplands, Peace Lowland, Wabasca Lowland, Western Alberta Upland, Western Boreal; Taiga Cordillera: Selwyn Mountains

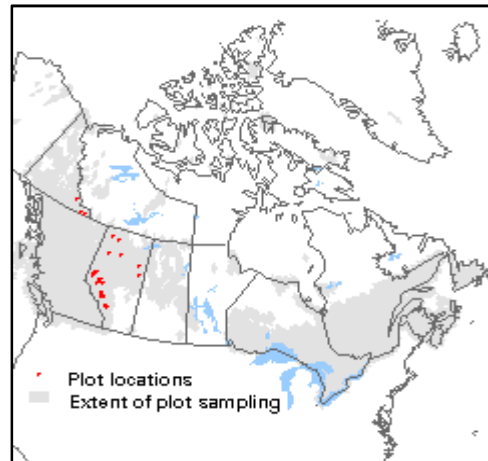
Rowe's Forest Regions and Sections of Canada: Boreal: Eastern Yukon, Hay River, Lower Foothills, Mixedwood, Upper Foothills, Upper Liard

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

Nature Conservancy of Canada Ecoregions: Boreal Plains

Ecozones and Ecoregions of the Yukon: Boreal Cordillera: Hyland Highland, Liard Basin; Taiga Cordillera: Selwyn Mountains

Natural Regions and Subregions of Alberta: Boreal Forest: Central Mixedwood, Dry Mixedwood; Foothills: Lower Foothills, Upper Foothills



Corresponding Types and Associations

CNVC00110	Yukon	Sb24	<i>Picea mariana</i> / <i>Alnus</i> spp. / <i>Petasites frigidus</i> – <i>Equisetum arvense</i> / Feathermoss
	Alberta	NN/BM/H/01/02	Sw - Sb / Labrador tea / feather moss
		SW/UF/G/01/01	Sb - Sw / horsetail / stair-step moss
		SW/UF/G/01/02	Sb - Sw / stair-step moss
		WC/UF/I/01/02	Sb - Sw / Labrador tea / feather moss



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Vegetation Summary*

Species Name [†]	Association CNVC00110	
	40 plots	
	% Cover [‡]	% Presence [^]
Overstory Trees		
<i>Picea mariana</i>	26	95
<i>Picea glauca</i>	24	88
<i>Pinus contorta</i>	6	38
<i>Populus balsamifera</i>	3	22
Tree Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(26 37 50 56 78)	
Understory Woody Shrubs and Regenerating Trees		
<i>Rosa acicularis</i>	3	90
<i>Rhododendron groenlandicum</i>	11	60
<i>Picea mariana</i>	7	47
<i>Picea glauca</i>	3	45
<i>Salix myrtillifolia</i>	1	32
<i>Shepherdia canadensis</i>	1	32
<i>Viburnum edule</i>	2	30
<i>Ribes lacustre</i>	1	28
<i>Salix sp.</i>	4	22
<i>Abies lasiocarpa</i>	4	22
<i>Populus balsamifera</i>	1	22
Shrub Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(3 8 23 31 47)	
Understory Herbs and Dwarf Shrubs		
<i>Linnaea borealis</i>	5	90
<i>Cornus canadensis</i>	5	77
<i>Mertensia paniculata</i>	2	77
<i>Vaccinium vitis-idaea</i>	5	65
<i>Petasites frigidus</i>	2	65
<i>Mitella nuda</i>	1	65
<i>Equisetum scirpoides</i>	1	65
<i>Chamerion angustifolium</i>	1	52
<i>Equisetum arvense</i>	4	50
<i>Leymus innovatus</i>	5	45
<i>Equisetum sylvaticum</i>	6	43
<i>Fragaria virginiana</i>	1	43
<i>Achillea millefolium</i>	1	43
<i>Galium boreale</i>	1	40
<i>Rubus pubescens</i>	2	35
<i>Arnica cordifolia</i>	2	30
<i>Orthilia secunda</i>	1	30
<i>Delphinium glaucum</i>	2	25



***Picea mariana* – *P. glauca* / *Mertensia paniculata* / *Hylocomium splendens* CNVC00110**

Vegetation Summary (cont'd)*

Species Name [†]	Association CNVC00110	
	% Cover [‡]	% Presence [^]
<i>Pyrola asarifolia</i>	1	25
<i>Geocaulon lividum</i>	1	25
<i>Equisetum pratense</i>	2	22
Herb Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(12 20 33 39 56)	
Bryophytes and Lichens		
<i>Hylocomium splendens</i>	56	82
<i>Peltigera aphthosa</i>	2	63
<i>Pleurozium schreberi</i>	23	57
<i>Ptilium crista-castrensis</i>	16	55
<i>Cladonia sp.</i>	2	30
<i>Peltigera canina</i>	1	22
Bryo-Lichen Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(65 76 85 96 100)	

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



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Site / Soil Characteristics

Association

CNVC00110

40 plots

Elevation Range (min–mean–max meters)

360–1068–1550

missing data (20)

Slope Gradient (% frequency)

moderately steep (10)

moderate (3)

gentle (20)

level (43)

missing data (25)

Aspect (% frequency)

north (25)

east (10)

south (8)

west (13)

level (15)

missing data (30)

Meso Toposition (% frequency)

crest / upper (5)

mid (18)

lower / toe (15)

level (23)

missing data (40)

Moisture Regime (% frequency)

mesic (8)

moist (65)

wet (5)

missing data (23)

Nutrient Regime (% frequency)

poor (8)

medium (43)

rich (23)

missing data (28)



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Site / Soil Characteristics (cont'd)

Association
CNVC00110

Soil Parent Material (% frequency)

bedrock (3)
colluvium (3)
eolian (18)
moraine / till (28)
fluvial (13)
glaciofluvial (8)
lacustrine (5)
glaciolacustrine (3)
organic (3)
missing data (20)

Soil Rooting Zone Substrate (% frequency)

non-soil (5)
sandy (5)
fine loamy (20)
silty (5)
clayey (15)
organic (5)
missing data (45)

Root Restricting Depth (% frequency)

21 – 99 cm (3)
missing data (98)

Humus Form (% frequency)

mor (28)
moder (3)
peatymor (8)
missing data (63)



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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:

CNVC00096 [*Picea glauca* / *Equisetum arvense* – *E. pratense*] occurs in the same range on moist sites that are better drained and slightly richer in nutrients. It has a purer *Picea glauca* overstory, less *Rhododendron groenlandicum* in the shrub layer and much more *Equisetum arvense* and *E. pratense* in the herb and dwarf shrub layer.

CNVC00113 [*Picea mariana* / *Equisetum arvense* / *Sphagnum* spp. – *Hylocomium splendens*] occurs in the same range on wetter sites that are nutrient-poor to medium. It has a more open, mostly pure, tree layer of *Picea mariana*, much more *Equisetum arvense* in the herb and dwarf shrub layer and greater cover of *Sphagnum* mosses.

CNVC00128 [*Picea mariana* / *Vaccinium vitis-idaea* / *Pleurozium schreberi* (*Hylocomium splendens*)] occurs on moist, nutrient-poor to medium sites on the boreal plains from northwestern Alberta to Manitoba. It has less *Picea glauca* in the overstory, less *Leymus innovatus* and *Linnaea borealis* in the herb and dwarf shrub layer and *Pleurozium schreberi*, rather than *Hylocomium splendens*, dominant in the moss layer.

CNVC00130 [*Picea mariana* / *Equisetum arvense* (*E. pratense*) / *Hylocomium splendens*] occurs on wetter sites in the same range. *Picea glauca* is often absent from the overstory and the herb and dwarf shrub layer is dominated by *Equisetum* spp.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

Comments

Abies lasiocarpa here refers to both *A. lasiocarpa* (subalpine fir) and *A. bifolia* (Rocky Mountain alpine fir).



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Source Information

Number of source plots for CNVC00110: 40

Information Sources:

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

Ecosystem and Landscape Classification Program. 2017. YBECMaster ecosystem plot database [VPro13/MSAccess 2010 format]. Ecol. Land Class. Prog. Dept. Env., Govt. Yukon, Whitehorse, Yukon.

Concept Authors: L. Allen, J. Archibald, K. Baldwin, K. Chapman, N. Flynn, C. Kennedy, K. McKenna, D. Meidinger

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

Date of Concept: March, 2012

Date of Description: August, 2017

Classification References:

Archibald, J.H.; Klappstein, G.D.; Corns, I.G.W. 1996. Field guide to ecosites of southwestern Alberta. Nat. Resour. Can., Can. For. Ser., North. For. Cent., Edmonton, AB. Spec. Rep. 8.

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.

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.

Meidinger, D.; Kennedy, C.E.; McKenna, K. 2017. In prep. Boreal treed vegetation associations of Yukon factsheets. Ecol. Land Class. Prog. Dept. Env. Govt. Yukon, Whitehorse, Yukon.

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).

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

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.

Fryer, J.L. 2014. *Picea mariana*. 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/picmar/all.html> (accessed: May 26, 2015).

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Horton, K.W.; Lees, J.C. 1961. Black spruce in the foothills of Alberta. *Can. Dept. For., For. Res. Branch., AB. Tech. Note No.* 110.

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.

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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