



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

<http://cnvc-cnvc.ca>

Forest / Forêt

Association CNVC00092

Populus tremuloides* – *Pinus contorta* / *Rhododendron groenlandicum* / *Leymus innovatus* – *Vaccinium vitis-idaea* / *Hylocomium splendens

Trembling Aspen – Lodgepole Pine / Common Labrador Tea / Downy Lyme grass – Lingonberry / Stairstep Moss

Peuplier faux-tremble – Pin tordu / Thé du Labrador / Élyme innovant – Airelle rouge / Hylocomie brillante

Subassociations: 92a *typic*, 92b *Alnus viridis*

CNVC Alliance: CA00030 *Pinus contorta* – *Picea mariana* / *Vaccinium vitis-idaea* / *Pleurozium schreberi*

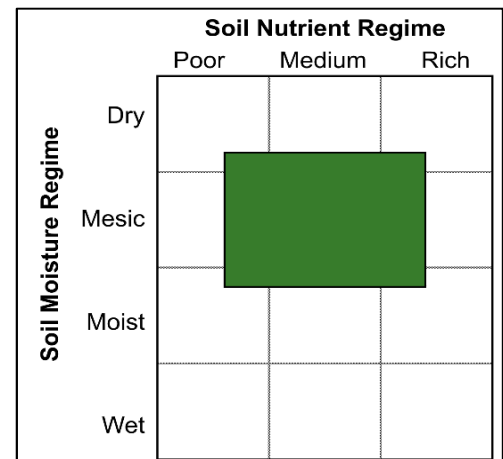
CNVC Group: CG0013 Cordilleran Boreal Mesic-Moist Black Spruce – Lodgepole Pine Forest

Type Description

Concept: CNVC00092 is a boreal mixedwood forest Association that occurs in Alberta. It has a moderately closed canopy usually codominated by trembling aspen (*Populus tremuloides*) and lodgepole pine (*Pinus contorta*). White spruce (*Picea glauca*) is usually present, sometimes as the dominant conifer. The well-developed shrub layer typically includes abundant common Labrador tea (*Rhododendron groenlandicum*) and less abundant prickly rose (*Rosa acicularis*), velvet-leaved blueberry (*Vaccinium myrtilloides*) and regenerating trembling aspen. Green alder (*Alnus viridis*) can be abundant where present and distinguishes a subassociation of the same name. The herb and dwarf shrub layer is dense and has abundant bunchberry (*Cornus canadensis*), downy lyme grass (*Leymus innovatus*) and lingonberry (*Vaccinium vitis-idaea*) as well as lower cover of twinflower (*Linnaea borealis*), fireweed (*Chamerion angustifolium*), pink pyrola (*Pyrola asarifolia*), bluejoint reedgrass (*Calamagrostis canadensis*), arctic sweet coltsfoot (*Petasites frigidus*) and wild lily-of-the-valley (*Maianthemum canadense*). The moss layer is poorly developed to continuous, depending on the amount of broad-leaf litter on the forest floor. It usually includes stairstep moss (*Hylocomium splendens*), red-stemmed feathermoss (*Pleurozium schreberi*) and knight's plume moss (*Ptilium crista-castrensis*). CNVC00092 occurs mainly on mesic, nutrient-medium sites in a region with a subhumid continental climate. It is an early seral condition that typically establishes after fire. There are two subassociations, *typic* and *Alnus viridis*.

Vegetation: CNVC00092 is a mixedwood forest Association with a moderately closed canopy of *Populus tremuloides* with *Pinus contorta* and/or *Picea glauca*, sometimes with a minor component of *Picea mariana*. The shrub layer is usually well developed. *Rhododendron groenlandicum* is abundant and *Rosa acicularis*, *Vaccinium myrtilloides* and, in larger canopy openings, *P. tremuloides* are common. *Alnus viridis* dominance distinguishes the subassociation of the same name. The herb and dwarf shrub layer is dense with abundant *Cornus canadensis*, *Leymus innovatus* and *Vaccinium vitis-idaea*. This layer typically also includes *Linnaea borealis*, *Chamerion angustifolium*, *Pyrola asarifolia*, *Calamagrostis canadensis*, *Petasites frigidus* and *Maianthemum canadense*. The moss layer varies from poorly developed to continuous; it is better developed in stands with less broad-leaf and grass litter (i.e., greater conifer cover). It typically includes *Hylocomium splendens*, *Pleurozium schreberi* and *Ptilium crista-castrensis*.

Environment: CNVC00092 occurs in a subhumid continental climate where fire cycles are short (<100 years) or intermediate (100-270 years). It is typically found on mesic, nutrient-medium sites. Stands generally occur on level sites or gentle slopes on middle to upper-slope topositions. They are frequently on cooler, north-facing aspects. Soils are usually fine or coarse loams or clays of morainal, glaciofluvial, glaciolacustrine or eolian origin. Humus forms are mors. The *Alnus viridis* subassociation occurs more frequently on coarse loamy soils than does the *typic* subassociation.





***Populus tremuloides* – *Pinus contorta* / *Rhododendron groenlandicum* / *Leymus innovatus* – *Vaccinium vitis-idaea* / *Hylocomium splendens* CNVC00092**

Type Description (cont'd)

Dynamics: CNVC00092 is an early seral condition that typically establishes after fire. *Populus tremuloides* and *Pinus contorta* are pioneer species adapted to disturbance. *P. tremuloides* can reproduce vegetatively from root suckers following any disturbance that does not kill its roots. It also produces abundant, light, wind-dispersed seeds that can readily colonize mineral soil seedbeds exposed by disturbance. *P. contorta* has cones that open when heated by fire, releasing large quantities of seeds onto fire-prepared seedbeds. Both of these species grow rapidly in full-light conditions but are intolerant of shade so do not replace themselves in a stand without further disturbance.

Succession usually proceeds slowly on these sites, typically with ingress of *Picea glauca* into the stand by seed dissemination from nearby sources. If seed sources are available, *P. glauca* sometimes re-colonizes at the same time as *P. tremuloides* and *P. contorta*, but *P. glauca* grows more slowly so it usually requires several decades to attain canopy height (e.g., CNVC00091 [*Populus tremuloides* – *Picea glauca* – *Pinus contorta* / *Leymus innovatus*]). *P. glauca* is shade-tolerant and able to self-replace once established in a stand. Fire often re-initiates CNVC00092 before a stand reaches a mid-successional stage.

Forest tent caterpillar (*Malacosoma disstria*) and *Armillaria* root disease (*Armillaria* spp.) can have significant impacts on *P. tremuloides*. Defoliation by the caterpillar can reduce growth, cause dieback and sometimes lead to mortality over successive years. *Armillaria* spp. can weaken or kill individual or small groups of trees. Canopy openings that result from insect or pathogen disturbance can promote forest succession by enhancing the growth of *P. glauca* in the understory.

In recent years, mountain pine beetle has caused significant economic and ecological impacts on *P. contorta* forests in temperate British Columbia (BC). Recently the beetle has spread northward and eastward into boreal *P. contorta* forests, affecting even hybrid *Pinus x murraybanksiana* and *P. banksiana* stands. Climate change and forest management practices, including fire suppression, have likely contributed to these unprecedented beetle densities, as well as to the expansion of its range and host species. Since the mountain pine beetle is novel to boreal ecosystems, long-term effects on these forests are uncertain.

Range: CNVC00092 occurs in the Rocky Mountain foothills of Alberta.

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

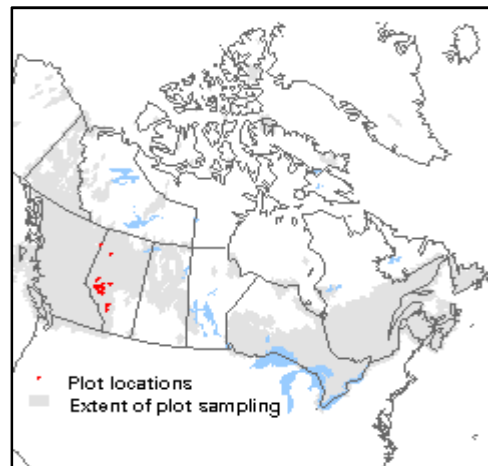
Terrestrial Ecozones and Ecoregions of Canada: Boreal Plains: Clear Hills Upland, Western Alberta Upland

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

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

Nature Conservancy of Canada Ecoregions: Boreal Plains

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



Corresponding Types and Associations

92a typic	Alberta	SW/LF/C/02/01	Aw – Sw – PI / Labrador tea / Schreber's moss
		WC/LF/C/03/03	Aw – Sw – PI / Labrador tea / hairy wild rye
		WC/UF/C/03/01	Aw – Sw – PI / Canada buffalo-berry / hairy wild rye
92b <i>Alnus viridis</i>	Alberta	WC/LF/C/03/02	Aw – Sw – PI / green alder / hairy wild rye
		WC/UF/C/03/02	Aw – Sw – PI / green alder / hairy wild rye



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Vegetation Summary*

Species Name [†]	Association CNVC00092		Subassociation 92a <i>typic</i>		Subassociation 92b <i>Alnus viridis</i>	
	26 plots		18 plots		8 plots	
	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]
Overstory Trees						
<i>Populus tremuloides</i>	20	100	20	100	22	100
<i>Pinus contorta</i>	20	88	18	83	22	100
<i>Picea glauca</i>	10	73	11	83	8	50
<i>Picea mariana</i>	8	50	10	44	6	63
<i>Populus balsamifera</i>	6	19	5	22	12	13
<i>Abies lasiocarpa</i>	3	8	-	-	3	25
Tree Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(35 43 51 62 66)		(35 40 50 61 66)		(43 49 54 59 67)	
Understory Woody Shrubs and Regenerating Trees						
<i>Rhododendron groenlandicum</i>	17	92	18	94	15	88
<i>Rosa acicularis</i>	4	92	4	89	5	100
<i>Vaccinium myrtilloides</i>	6	65	6	67	6	63
<i>Alnus viridis</i>	17	62	3	44	31	100
<i>Populus tremuloides</i>	3	62	3	67	2	50
<i>Viburnum edule</i>	3	58	2	50	5	75
<i>Picea glauca</i>	3	46	3	50	4	38
<i>Shepherdia canadensis</i>	9	42	6	50	20	25
<i>Picea mariana</i>	3	42	3	33	2	63
<i>Salix bebbiana</i>	6	38	5	44	10	25
<i>Lonicera involucrata</i>	3	31	4	22	2	50
<i>Pinus contorta</i>	2	31	2	33	2	25
<i>Abies lasiocarpa</i>	5	27	5	28	6	25
<i>Lonicera dioica</i>	3	23	1	22	6	25
<i>Spiraea lucida</i>	3	19	3	28	-	-
<i>Vaccinium membranaceum</i>	13	15	25	11	1	25
<i>Populus balsamifera</i>	2	15	2	22	-	-
Shrub Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(18 30 52 72 89)		(15 23 45 59 78)		(32 48 67 84 100)	
Understory Herbs and Dwarf Shrubs						
<i>Cornus canadensis</i>	11	96	10	100	12	88
<i>Linnaea borealis</i>	7	96	7	100	6	88
<i>Leymus innovatus</i>	10	85	7	78	16	100
<i>Chamerion angustifolium</i>	4	85	3	89	6	75
<i>Vaccinium vitis-idaea</i>	12	73	12	78	12	63
<i>Pyrola asarifolia</i>	2	73	2	67	2	88
<i>Calamagrostis canadensis</i>	7	62	9	67	2	50
<i>Petasites frigidus</i>	4	62	3	56	4	75



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Vegetation Summary (cont'd)*

Species Name†	Association CNVC00092		Subassociation 92a <i>typic</i>		Subassociation 92b <i>Alnus viridis</i>	
	% Cover‡	% Presence^	% Cover‡	% Presence^	% Cover‡	% Presence^
<i>Maianthemum canadense</i>	2	62	2	61	2	63
<i>Fragaria virginiana</i>	3	58	4	56	3	63
<i>Arnica cordifolia</i>	3	54	3	56	2	50
<i>Orthilia secunda</i>	1	54	1	56	2	50
<i>Vaccinium caespitosum</i>	4	46	3	56	5	25
<i>Rubus pubescens</i>	7	42	9	39	2	50
<i>Lathyrus ochroleucus</i>	3	42	3	56	1	13
<i>Symphytotrichum ciliolatum</i>	2	38	2	39	2	38
<i>Galium boreale</i>	1	35	1	33	1	38
<i>Viola renifolia</i>	1	35	1	33	1	38
<i>Diphasiastrum complanatum</i>	8	31	9	33	3	25
<i>Arctostaphylos uva-ursi</i>	3	31	2	33	7	25
<i>Lycopodium annotinum</i>	9	27	7	28	13	25
<i>Mitella nuda</i>	2	27	3	22	1	38
<i>Mertensia paniculata</i>	3	23	3	17	3	38
<i>Geocaulon lividum</i>	2	23	2	22	2	25
<i>Pyrola chlorantha</i>	1	23	1	22	1	25
<i>Vicia americana</i>	2	19	2	28	-	-
<i>Achillea millefolium</i>	1	19	1	28	-	-
<i>Aralia nudicaulis</i>	10	15	10	6	10	38
<i>Streptopus amplexifolius</i>	1	15	1	22	-	-
<i>Equisetum pratense</i>	1	8	-	-	1	25
<i>Prosartes trachycarpa</i>	1	8	-	-	1	25
Herb Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(40 48 68 83 100)		(40 48 67 84 100)		(42 58 70 81 89)	
Bryophytes and Lichens						
<i>Hylocomium splendens</i>	20	85	21	89	16	75
<i>Pleurozium schreberi</i>	26	81	29	83	21	75
<i>Ptilium crista-castrensis</i>	10	65	12	61	5	75
<i>Peltigera aphthosa</i>	3	35	3	39	3	25
<i>Cladonia sp.</i>	2	35	2	50	-	-
<i>Ptilidium pulcherrimum</i>	1	23	1	28	1	13
<i>Brachythecium salebrosum</i>	1	19	1	22	1	13
<i>Dicranum scoparium</i>	1	15	1	22	-	-
<i>Peltigera canina</i>	1	15	1	22	-	-
<i>Sanionia uncinata</i>	1	15	1	22	-	-
Bryo-Lichen Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(5 18 49 80 92)		(12 20 56 80 96)		(4 11 34 42 87)	

* 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 CNVC00092 26 plots	Subassociation 92a <i>typic</i> 18 plots	Subassociation 92b <i>Alnus viridis</i> 8 plots
Elevation Range (min–mean–max meters)	650–1084–1340	650–1077–1332	914–1101–1340
Slope Gradient (% frequency)	steep (4) moderately steep (8) moderate (4) gentle (38) level (46)	steep (0) moderately steep (6) moderate (6) gentle (33) level (56)	steep (13) moderately steep (13) moderate (0) gentle (50) level (25)
Aspect (% frequency)	north (38) east (15) south (8) west (19) level (15) missing data (4)	north (39) east (17) south (11) west (17) level (17) missing data (0)	north (38) east (13) south (0) west (25) level (13) missing data (13)
Meso Toposition (% frequency)	crest / upper (15) mid (23) lower / toe (4) level (4) missing data (54)	crest / upper (17) mid (22) lower / toe (6) level (6) missing data (50)	crest / upper (13) mid (25) lower / toe (0) level (0) missing data (63)
Moisture Regime (% frequency)	dry (12) mesic (77) moist (12)	dry (6) mesic (78) moist (17)	dry (25) mesic (75) moist (0)
Nutrient Regime (% frequency)	poor (23) medium (58) rich (19)	poor (22) medium (56) rich (22)	poor (25) medium (63) rich (13)



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Site / Soil Characteristics (cont'd)

	Association CNVC00092	Subassociation 92a <i>typic</i>	Subassociation 92b <i>Alnus viridis</i>
Soil Parent Material (% frequency)	eolian (12) moraine / till (35) fluvial (4) glaciofluvial (31) glaciolacustrine (19)	eolian (6) moraine / till (44) fluvial (0) glaciofluvial (28) glaciolacustrine (22)	eolian (25) moraine / till (13) fluvial (13) glaciofluvial (38) glaciolacustrine (13)
Soil Rooting Zone Substrate (% frequency)	sandy (4) coarse loamy (23) fine loamy (27) silty (8) clayey (15) missing data (23)	sandy (6) coarse loamy (11) fine loamy (39) silty (6) clayey (17) missing data (22)	sandy (0) coarse loamy (50) fine loamy (0) silty (13) clayey (13) missing data (25)
Root Restricting Depth (% frequency)	missing data (100)	missing data (100)	missing data (100)
Humus Form (% frequency)	mor (19) missing data (81)	mor (22) missing data (78)	mor (13) missing data (88)



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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:

CNVC00087 [*Populus tremuloides* / *Leymus innovatus*] is a hardwood Association that occurs on similar, but warmer sites in the same range.

CNVC00091 [*Populus tremuloides* – *Picea glauca* – *Pinus contorta* / *Leymus innovatus*] occurs on similar, but warmer sites in the same range and has less *Alnus viridis*, *Rhododendron groenlandicum*, *Vaccinium myrtilloides* and *V. vitis-idaea* and more *Arctostaphylos uva-ursi* in the shrub layers (see Dynamics).

CNVC00111 [*Picea mariana* – *Populus tremuloides* / *Vaccinium vitis-idaea* / *Hylocomium splendens*] occurs on slightly moister boreal sites in British Columbia and Yukon and has greater *Picea mariana* constancy and cover in the canopy. It has less *Alnus viridis* and *Vaccinium myrtilloides* in the shrub layer and lacks *Leymus innovatus* in the herb and dwarf shrub layer.

CNVC00121 [*Pinus contorta* / *Shepherdia canadensis* / *Leymus innovatus*] is a similar coniferous Association that occurs on comparable boreal sites in the same range. It has *Pinus contorta* dominant in the overstory, more *Shepherdia canadensis* in the shrub layer and less *Calamagrostis canadensis* and *Vaccinium vitis-idaea* in the herb and dwarf shrub layer.

CNVC00122 [*Pinus contorta* / *Viburnum edule* – *Rosa acicularis* / *Hylocomium splendens*] is a similar coniferous Association that occurs on comparable or slightly moister boreal sites in the same range. It has *Pinus contorta* dominant in the overstory and less *Rhododendron groenlandicum* and *Vaccinium myrtilloides* in the shrub layer.

CNVC00125 [*Populus tremuloides* – *Pinus banksiana* / *Vaccinium myrtilloides* / *V. vitis-idaea*] occurs on drier, poorer boreal sites from Alberta to northwestern Ontario and has codominance of *Pinus banksiana* rather than *P. contorta*.

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 CNVC00092: 26

Number of source plots for 92a *typic*: 18

Number of source plots for 92b *Alnus viridis*: 8

Information Sources:

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

Concept Authors: L. Allen, J. Archibald, K. Baldwin, K. Chapman

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

Date of Concept: March, 2012

Date of Description: November, 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. Centre, Edmonton, AB. Spec. Rep. 8.

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. Centre, Edmonton, AB. Spec. Rep. 9.

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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Howard, J.L. 1996. *Populus tremuloides*. 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/poptre/all.html> (accessed: May 27, 2015).

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.

Nealis, V.G.; Cooke, B. J. 2014. Risk assessment of the threat of mountain pine beetle to Canada's boreal and eastern pine forests. Nat. Resour. Can., Can. Coun. For. Min., Forest Pest Working Group, CA.

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.



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Hylocomium splendens CNVC00092**

Characterization References (cont'd):

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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