Forest / Forêt **Association CNVC00124**

Pinus contorta / Oplopanax horridus

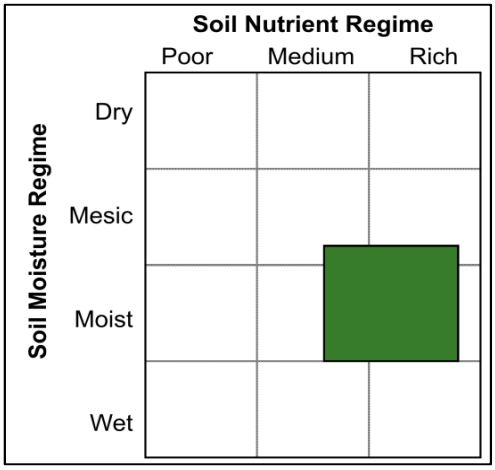
Lodgepole Pine / Devil's Club

Pin tordu / Bois piquant

Subassociations: none
CNVC Alliance: CA00039 *Picea glauca – Pinus contorta / Lonicera involucrata / Gymnocarpium dryopteris*
CNVC Group: CG0015 Cordilleran Boreal Moist White Spruce – Trembling Aspen (Balsam Poplar) Forest

Type Description

Concept: CNVC00124 is a boreal coniferous forest Association that occurs in the Rocky Mountain foothills of Alberta. It has a moderately closed canopy of lodgepole pine (*Pinus contorta*) and a moderately developed shrub layer that is relatively diverse and includes numerous nutrient-demanding species. Devil's club (*Oplopanax horridus*) characterizes the shrub layer, but other species include squashberry (*Viburnum edule*), bracted honeysuckle (*Lonicera involucrata*), prickly rose (*Rosa acicularis*), Greene's mountain-ash (*Sorbus scopulina*), red raspberry (*Rubus idaeus*), shiny-leaved meadowsweet (*Spiraea lucida*) and regenerating *Abies lasiocarpa* and *Betula papyrifera*. The herb and dwarf shrub layer is well developed and usually includes common oak fern (*Gymnocarpium dryopteris*), bunchberry (*Cornus canadensis*), dwarf raspberry (*Rubus pubescens*), fireweed (*Chamerion angustifolium*), twinflower (*Linnaea borealis*), wild sarsaparilla (*Aralia nudicaulis*), stiff clubmoss (*Lycopodium annotinum*), clasping-leaved twisted-stalk (*Streptopus amplexifolius*), arctic sweet coltsfoot (*Petasites frigidus*), bluejoint reedgrass (*Calamagrostis canadensis*), meadow horsetail (*Equisetum sylvaticum*), five-leaved dwarf bramble (*R. pedatus*), wild lily-of-the-valley (*Maianthemum canadense*) and three-leaved foamflower (*Tiarella trifoliata*). The forest floor cover is mainly broad-leaf litter, so the moss layer is sparse, with only minor cover of red-stemmed feathermoss (*Pleurozium schreberi*) and knight's plume moss (*Ptilium crista-castrensis*). CNVC00124 occurs on moist, nutrient-rich sites in a region with a subhumid continental climate. These are among the most productive sites in the region. CNVC00124 typically establishes as the first cohort after fire.



Vegetation: CNVC00124 is a coniferous forest Association with a moderately closed canopy of *Pinus contorta* (see Comments). Both the shrub and herb layers are diverse and include species indicative of nutrient-rich sites. The shrub layer is moderately developed and dominated by *Oplopanax horridus*, but this layer also includes *Viburnum edule, Lonicera involucrata, Rosa acicularis, Sorbus scopulina, Rubus idaeus, Spiraea lucida* and regenerating *Abies lasiocarpa* and *Betula papyrifera*. *Aralia nudicaulis* often dominates the herb layer, but the ferns *Gymnocarpium dryopteris, Athyrium filix-femina,* and *Dryopteris expansa* may be abundant on some sites. Other species typical of the herb and dwarf shrub layer include *Cornus canadensis, Rubus pubescens, Chamerion angustifolium, Linnaea borealis, Lycopodium annotinum, Streptopus amplexifolius, Petasites frigidus, Calamagrostis canadensis, Equisetum sylvaticum, R. pedatus, Maianthemum canadense* and *Tiarella trifoliata*. Forest floor cover is predominantly broad-leaf litter, so the moss layer is poorly developed, with only *Pleurozium schreberi* and *Ptilium crista-castrensis* common, mainly on fallen logs and at tree bases.

Pinus contorta / Oplopanax horridus CNVC00124

Type Description (cont'd)

Environment: CNVC00124 occurs in a subhumid continental climate where regional fire cycles are short (<100 years) or intermediate (100-270 years). It is typically found on moist, nutrient-rich sites; these are some of the most productive sites in the foothills of Alberta. Stands are usually on gentle slopes on water-receiving middle-slope topopositions. Seepage often enhances moisture and nutrient availability on these sites. On slopes, stands are more common on cooler, north-facing aspects. Soils are fine textured (e.g., clays, silts and fine loams) and derived from morainal parent materials. Mor humus forms are typical, but compared to other boreal Associations, moders are more likely to develop.

Dynamics: CNVC00124 is an early to mid-successional Association that is naturally perpetuated by stand-replacing fire. *Pinus contorta* has medium thick bark, with only moderate tolerance to fire, but reaches reproductive maturity at a young age and produces abundant seeds in serotinous cones. Moderate and high severity fires melt the resin of cones to release their seeds. These fires also remove competing vegetation and improve seedbed quality by reducing organic matter and exposing mineral soil. Maximum seed release can therefore coincide with optimal conditions for seedling establishment, survival and growth.

Succession typically proceeds with ingress of *Picea glauca* into the stand by seed dissemination from nearby sources. If seeds are available following disturbance, *P. glauca* sometimes re-colonizes at approximately the same time as *P. contorta,* but since it grows more slowly it usually requires several decades to attain canopy height. *P. glauca* is shade-tolerant and able to self-replace once established in a stand. Succession is often re-initiated by fire before a stand reaches the mid-successional stage, but in the prolonged absence of disturbance *P. glauca* can gradually dominate the overstory. A late successional *P. glauca*-dominated condition (e.g., CNVC00099 [*Picea glauca / Oplopanax horridus*]) could develop after approximately 120 years.

After fire or harvesting, species such as *Calamagrostis canadensis* and *Rubus idaeus* can be highly competitive with regenerating conifers on these sites and delay stand re-establishment.

In recent years, mountain pine beetle (*Dendroctonus ponderosae*) has caused significant economic and ecological impacts to *P. contorta* forests in sub-boreal British Columbia (BC). Within its historic range in interior BC, beetle cycles occur every 20-40 years. At low population densities, the insect preferentially attacks and kills older, less vigorous trees, opening canopy gaps. At epidemic levels however, mass attacks can extend over large areas and overwhelm the defenses of vigorously growing immature pines. Recently the beetle has spread northward and eastward into boreal *P. contorta* forests, affecting even hybrid *Pinus x murraybanksiana* and *P. banksiana* stands in northern Alberta. 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. Because the mountain pine beetle is novel to boreal ecosystems, long-term effects on these forests are uncertain.

Range: CNVC00124 is described from 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: Western Alberta Upland

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

Corresponding Types and Associations

CNVC00124	Alberta	WC/LF/F/01/04	Pl / devil's-club / fern

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Vegetation Summary*

Species Name[†]	Association CNVC00124 8 plots % Cover[±]	% Presence^
Overstory Trees		
Pinus contorta	**41**	**100**
Picea glauca	6	50
Betula papyrifera	5	38
Populus tremuloides	5	38
Tree Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(28 41 49 61 64)**	
Understory Woody Shrubs and Regenerating Trees		
Oplopanax horridus	**14**	**100**
Viburnum edule	3	100
Lonicera involucrata	3	100
Rosa acicularis	3	75
Sorbus scopulina	2	75
Abies lasiocarpa	3	63
Rubus idaeus	3	63
Spiraea lucida	2	63
Betula papyrifera	1	63
Picea glauca	3	50
Ribes lacustre	2	50
Populus tremuloides	1	50
Vaccinium membranaceum	1	50
Rubus parviflorus	3	38
Rhododendron groenlandicum	1	38
Amelanchier alnifolia	1	38
Ribes oxyacanthoides	1	38
Vaccinium myrtilloides	1	38
Salix lucida	3	25
Alnus viridis	2	25
Pinus contorta	1	25
Shrub Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(25 32 38 43 55)**	
Understory Herbs and Dwarf Shrubs		
Gymnocarpium dryopteris	9	100
Cornus canadensis	6	100
Rubus pubescens	2	100
Chamerion angustifolium	2	100
Linnaea borealis	2	100
Aralia nudicaulis	13	88
Lycopodium annotinum	4	88
Streptopus amplexifolius	2	88
Petasites frigidus	2	88

Pinus contorta / Oplopanax horridus CNVC00124

Vegetation Summary (cont'd)*

Species Name†	Association CNVC00124 % Cover±	% Presence^
Calamagrostis canadensis	9	75
Equisetum sylvaticum	4	75
Rubus pedatus	3	75
Maianthemum canadense	2	75
Tiarella trifoliata	5	63
Maianthemum racemosum	1	50
Mitella nuda	1	38
Galium trifidum	1	38
Viola renifolia	1	38
Athyrium filix-femina	11	25
Dryopteris expansa	10	25
Pyrola asarifolia	3	25
Coptis trifolia	2	25
Dryopteris carthusiana	2	25
Equisetum arvense	2	25
Mertensia paniculata	1	25
Orthilia secunda	1	25
Herb Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(32 38 59 72 92)**	
Bryophytes and Lichens		
Pleurozium schreberi	15	100
Ptilium crista-castrensis	7	100
Hylocomium splendens	2	50
Plagiomnium medium	3	38
Dicranum brevifolium	2	38
Brachythecium starkei	2	25
Cladonia sp.	2	25
Dicranum fuscescens	1	25
Peltigera aphthosa	1	25
Bryo-Lichen Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(8 16 27 32 44)**	

* 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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Site / Soil Characteristics

	Association CNVC00124
	8 plots
Elevation Range (min–mean–max meters)	
	880–1041–1219
	missing data (25)
Slope Gradient (% frequency)	
	gentle (75)
	level (25)
Aspect (% frequency)	
	north (75)
	east (13)
	west (13)
Meso Topoposition (% frequency)	
	mid (75)
	missing data (25)
Moisture Regime (% frequency)	
	mesic (13)
	moist (88)
Nutrient Regime (% frequency)	
	medium (25)
	rich (75)
Soil Parent Material (% frequency)	
	moraine / till (100)
Soil Rooting Zone Substrate (% frequency)	
	fine loamy (25)
	silty (25)
	clayey (50)
Root Restricting Depth (% frequency)	
	missing data (100)
Humus Form (% frequency)	
	mor (50)
	missing data (50)

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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:

CNVC00084 [*Pinus contorta – Populus tremuloides – Populus balsamifera / Gymnocarpium dryopteris*] is a similar mixedwood Association that occurs on comparable boreal sites in the same range. It has *Populus* spp. in the overstory and lacks *Oplopanax horridus*.

CNVC00085 [*Pinus contorta – Betula papyrifera / Oplopanax horridus*] is a similar mixedwood Association that occurs on comparable boreal sites in the same range and has *Betula papyrifera* in the overstory.

CNVC00107 [*Pinus contorta / Alnus viridis / Arnica cordifolia / Pleurozium schreberi*] occurs on mesic to moist, nutrient-medium to poor boreal sites in the same range. It has lower constancy and cover of the nutrient-demanding species that characterize CNVC00124 and has greater abundance of *Rhododendron groenlandicum* and *Vaccinium vitis-idaea.*

CNVC00122 [*Pinus contorta / Viburnum edule – Rosa acicularis / Hylocomium splendens*] occurs on mesic to moist, nutrient-medium boreal sites in the same range and has less diverse shrub and herb layers. It has lower constancy and cover of the nutrient-demanding understory species of CNVC00124 like *Gymnocarpium dryopteris, Rubus pedatus* and *Streptopus amplexifolius*.

CNVC00123 [*Pinus contorta / Gymnocarpium dryopteris*] occurs on comparable boreal sites in the same range and lacks the constancy and cover of *Oplopanax horridus* in the shrub layer that helps to characterize CNVC00124. CNVC00123 also has more abundant *Alnus viridis* and greater feathermoss cover.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

Comments

Oplopanax horridus is considered a rare species in Alberta, with a “vulnerable” (S3) conservation ranking for the province in 2015 (i.e., fewer than 100 known occurrences, restricted range, habitat specificity and small population sizes). In Alberta, *O. horridus* is found only on cool, moist nutrient-rich sites in the Foothills natural region. However, it is common and abundant (S5) in British Columbia so this Association may occur there.

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

Pinus contorta / Oplopanax horridus CNVC00124

Source Information

Number of source plots for CNVC00124: 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. Baldwin and K. Chapman
Date of Concept: March, 2012
Date of Description: July, 2016

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.

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).

Alberta Environment and Parks. 2016. Alberta Conservation Information Management System (ACIMS). Available: http://www.albertaparks.ca/acims-data (accessed: August 30, 2016).

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.

British Columbia Ministry of Environment. 2016. BC Species and Ecosystems Explorer. Available: http://a100.gov.bc.ca/pub/eswp/ (accessed: August 30, 2016).

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.

Corns, I.G.W.; Downing, D.J.; Little, T.I. 2005. Field guide to ecosites of west-central Alberta: supplement for managed forest stands up to 40 years of age (first approximation). Nat. Resour. Can., Can. For. Serv., North. For. Cent., Edmonton, AB. Special Rep. 15.

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.

Haeussler, S.; Coates, D. 1986. Autecological characteristics of selected species that compete with conifers in British Columbia: a literature review. Skeena For. Consult. and B.C. Min. For. and Lands, Smithers and Victoria, BC. FRDA Rep. 001.

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.

Kershaw, L.J.; Gould, J.; Johnson, J.D.; Lancaster, J., editors. 2001. Rare vascular plants of Alberta. University of Alberta Press, Edmonton, AB, Can. For. Serv., North. For. Cent., Edmonton, AB.

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. Counc. For. Min., Forest Pest Working Group, CA.

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.

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Characterization References (cont'd):

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.

Strong, W. L.; Pluth, D.J.; La Roi, G.H.; Corns, I.G.W. 1991. Forest understory plants as predictors of lodgepole pine and white spruce site quality in west-central Alberta. Can. J. For. Res. 21:1675-1683.

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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