Forest / Forêt **Association CNVC00296**

Picea mariana – Abies balsamea / Alnus incana

Black Spruce – Balsam Fir / Speckled Alder

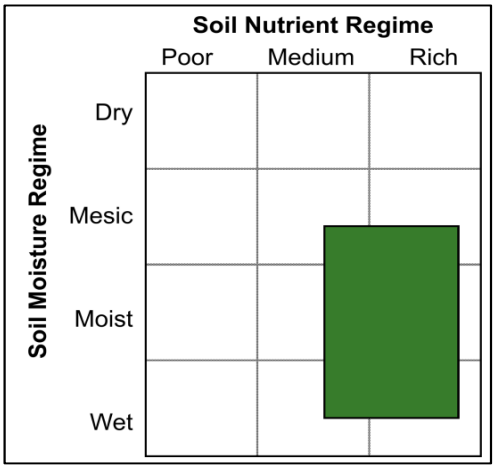
Épinette noire – Sapin baumier / Aulne rugueux

Subassociations: none
CNVC Alliance: CA00018 *Betula papyrifera – Abies balsamea / Alnus incana*
CNVC Group: CG0008 Ontario-Quebec Boreal Moist Black Spruce – Trembling Aspen – Balsam Fir – Paper Birch Forest

Type Description

Concept: CNVC00296 is a boreal coniferous forest Association that occurs in Ontario and Quebec. The canopy is usually moderately closed, comprising roughly equal proportions of black spruce (*Picea mariana*) and balsam fir (*Abies balsamea*). The dense shrub layer has abundant speckled alder (*Alnus incana*), with lower abundance of regenerating balsam fir and black spruce as well as the shrub species red raspberry (*Rubus idaeus*), common Labrador tea (*Rhododendron groenlandicum*), velvet-leaved blueberry (*Vaccinium myrtilloides*) and willows (*Salix* spp.). The herb layer is moderately developed and typically includes bunchberry (*Cornus canadensis*), twinflower (*Linnaea borealis*), wild lily-of-the-valley (*Maianthemum canadense*), northern starflower (*Lysimachia borealis*), yellow clintonia (*Clintonia borealis*), goldthread (*Coptis trifolia*), creeping snowberry (*Gaultheria hispidula*), dwarf raspberry (*Rubus pubescens*), sedges (*Carex* spp.) and violets (*Viola* spp.). The moss layer is moderately developed; red-stemmed feathermoss (*Pleurozium schreberi*) is dominant, but knight's plume moss (*Ptilium crista-castrensis*) and broom mosses (*Dicranum* spp.) are also present, sometimes with discontinuous patches of peat mosses (*Sphagnum* spp.). CNVC00296 occurs in a region with a continental boreal climate that grades from subhumid in the western portion of its range to humid in the east. It is usually found on moist, nutrient-medium to rich sites. It is a late seral condition with dynamics driven mainly by fire, outbreaks of spruce budworm (*Choristoneura fumiferana*) and windthrow. Although black spruce and balsam fir are present in every stand, climate and disturbance type and history affect the relative dominance of each species.

Vegetation: CNVC00296 is a coniferous forest Association with a moderately closed canopy codominated by *Picea mariana* and *Abies balsamea.* The dense shrub layer is dominated by thickets of *Alnus incana* (see Comments) interspersed with regenerating *A. balsamea* and *P. mariana.* Less abundant shrubs include *Rubus idaeus, Rhododendron groenlandicum, Vaccinium myrtilloides* and *Salix* spp. The herb layer is moderately developed and typically includes *Cornus canadensis, Linnaea borealis, Maianthemum canadense, Lysimachia borealis, Clintonia borealis, Coptis trifolia, Gaultheria hispidula, Rubus pubescens, Carex* spp. and *Viola* spp. The moderately developed moss layer consists mainly of *Pleurozium schreberi,* with lower cover of *Ptilium crista-castrensis, Dicranum* spp. and patches of *Sphagnum* mosses.



Picea mariana – Abies balsamea / Alnus incana CNVC00296

Type Description (cont'd)

Environment: CNVC00296 occurs in a continental boreal climate that is subhumid in the western part of its range, becoming increasingly humid farther east. It is found on mesic, moist or wet (usually moist), nutrient-medium to rich sites. Stands are often on level sites where organic materials sometimes exceed 40cm over fine-textured glaciolacustrine or lacustrine mineral soils, especially in the Clay Belt of notheastern Ontario and western Quebec. Less frequently, stands occur on gentle morainal slopes on water-receiving, middle to lower or toe-slope topopositions, where sites typically have coarse-textured soils. The higher nutrient status of these sites is maintained by cation-rich mineral substrates (e.g., clays) or from nutrient-rich seepage or groundwater fluctuation. Even in the subhumid climate of the western part of the range, these soils retain enough moisture to support *Alnus incana,* a shrub that fixes nitrogen, further enriching the soil nutrient status. Mor humus forms are common, but compared to other boreal Associations, moders are relatively frequent. Peatymors develop on wetter sites.

Within the range of CNVC00296 regional fire cycles are intermediate (100-270 years), long (270-500 years) or even very long (>500 years). However, these stands often occur where there are natural fire breaks (e.g., water bodies) and are less prone to fire because of their moisture status and thick organic layer. Where the regional fire cycle is intermediate, stands are less likely to burn than the surrounding landscape. Fire cycle length influences the relative dominance of *Picea mariana* and *Abies balsamea* in each stand. Longer fire cycles favour the late seral species *A. balsamea*.

Dynamics: CNVC0296 is a late seral condition with dynamics mainly driven by fire and outbreaks of spruce budworm (*Choristoneura fumiferana*) and windthrow. It can succeed a *Picea mariana* Association such as CNVC00295 [*Picea mariana / Alnus incana / Pleurozium schreberi*] that forms after fire.

Picea mariana and *Abies balsamea* both have thin bark and are unlikely to survive fire, but *P. mariana* has cones that open when heated to release seeds while *A. balsamea* cones are destroyed. Consequently, *P. mariana* typically forms the initial post-fire cohort while *A. balsamea* becomes established in the stand later when seeds are disseminated from nearby areas. As *A. balsamea* grows into the canopy over time, the CNVC00296 condition is formed. Compared to *P. mariana, A. balsamea* is more vulnerable to spruce budworm, so outbreaks of this insect favour *P. mariana*. Proportions of these tree species are thus affected by the disturbance type, history, frequency and severity.

Alnus incana can form dense thickets in canopy openings, particularly after harvesting when tree removal can contribute to a rise in the water table. These thickets can significantly delay the growth of regenerating trees. The deep roots of *A. incana* can survive even high-severity fires and it can respond quickly after disturbance by sprouting. Being semi-shade tolerant, *A. incana* persists even as the canopy closes, limiting available light for plants beneath it.

Range: CNVC00296 occurs in the boreal region of Ontario and Quebec. It ranges from northwestern Ontario to the Upper North Shore of the Gulf of Saint Lawrence near Sept-Îles, Quebec and also occurs in the Gaspé region. It is most common on the Clay Belt of northeastern Ontario and western Quebec.

Conservation Status (NatureServe)

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

Forest / Forêt **Association CNVC00296**

Picea mariana – Abies balsamea / Alnus incana

Black Spruce – Balsam Fir / Speckled Alder

Épinette noire – Sapin baumier / Aulne rugueux

Distribution

Countries: Canada

Provinces / Territories / States: Ontario, Quebec

Terrestrial Ecozones and Ecoregions of Canada: Atlantic Highlands: Appalachians, Northern New Brunswick Uplands; Boreal Shield: Abitibi Plains, Central Laurentians, Lac Seul Upland, Lake Nipigon, Rivière Rupert Plateau, Southern Laurentians, Thunder Bay-Quetico

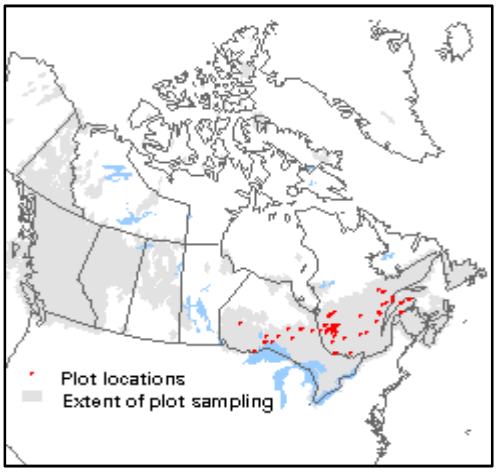
Rowe's Forest Regions and Sections of Canada: Boreal: Central Plateau, Chibougamau-Natashquan, Gaspé, Gouin, Laurentide-Onatchiway, Missinaibi-Cabonga, Northern Clay, Northern Coniferous, Superior; Great Lakes-St.Lawrence: Algonquin-Pontiac, Laurentian, Middle Ottawa, Quetico, Saguenay, Temiscouata-Restigouche

NAAEC CEC Ecoregions of North America (Levels I & II): Northern Forests: Atlantic Highlands, Mixed Wood Shield, Softwood Shield

Nature Conservancy of Canada Ecoregions: Boreal Shield, Great Lakes, Northern Appalachians-Acadia, Superior Mixed Forest

Ecological Land Classification of Ontario (ecoregions and ecodistricts): 1E-2, 2E-2, 2E-4, 2W-1, 2W-2, 2W-3, 3E-1, 3E-2, 3E-4, 3E-5, 3E-6, 3E-7, 3S-1, 3S-2, 3S-3, 3S-4, 3S-5, 3W-1, 3W-2, 3W-3, 3W-4, 3W-5, 4S-1, 4S-2, 4S-3, 4S-4, 4S-5, 4S-6, 4W-1, 4W-2, 5S-2

Bioclimatic Domains and Subdomains of Québec: 2 Ouest, 3 Ouest, 4 Est, 4 Ouest, 5 Est, 5 Ouest, 6 Est, 6 Ouest



Corresponding Types and Associations

CNVC00296	Ontario	BwTr12-5	*Picea mariana - Abies balsamea / Alnus incana / Rubus pubescens / Pleurozium schreberi*
	Quebec	QC015	*Picea mariana - Abies balsamea / Alnus incana*

Forest / Forêt **Association CNVC00296**

Picea mariana – Abies balsamea / Alnus incana

Black Spruce – Balsam Fir / Speckled Alder

Épinette noire – Sapin baumier / Aulne rugueux

Vegetation Summary*

Species Name[T]	Association CNVC00296 56 plots % Cover[±]	% Presence^
Overstory Trees		
Picea mariana	**22**	**100**
Abies balsamea	**23**	**98**
Betula papyrifera	7	43
Populus tremuloides	9	27
Picea glauca	13	21
Tree Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(32 36 57 76 88)**	
Understory Woody Shrubs and Regenerating Trees		
Alnus incana	**39**	**100**
Abies balsamea	13	96
Picea mariana	5	89
Rubus idaeus	5	64
Rhododendron groenlandicum	5	63
Vaccinium myrtilloides	3	63
Salix sp.	9	61
Amelanchier sp.	5	59
Vaccinium angustifolium	3	54
Betula papyrifera	5	52
Ribes glandulosum	4	52
Sorbus americana	3	39
Ribes triste	3	39
Kalmia angustifolia	4	32
Viburnum edule	2	32
Sorbus decora	2	30
Cornus stolonifera	4	27
Rosa acicularis	2	27
Sambucus racemosa	3	25
Diervilla lonicera	8	23
Acer spicatum	7	23
Populus tremuloides	3	23
Ribes lacustre	2	21
Shrub Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(32 49 67 94 99)**	
Understory Herbs and Dwarf Shrubs		
Cornus canadensis	7	91
Linnaea borealis	3	77
Maianthemum canadense	3	75
Lysimachia borealis	2	75
Clintonia borealis	3	73
Coptis trifolia	2	73

Picea mariana – Abies balsamea / Alnus incana CNVC00296

Vegetation Summary (cont'd)*

	Association CNVC00296	
Species Name†	% Cover±	% Presence^
Gaultheria hispidula	3	71
Rubus pubescens	5	68
Carex sp.	6	63
Viola sp.	3	61
Lycopodium annotinum	9	57
Poaceae	6	57
Dryopteris spinulosa complex	4	50
Aralia nudicaulis	3	50
Gymnocarpium dryopteris	2	43
Equisetum sp.	3	36
Equisetum sylvaticum	3	36
Petasites frigidus	3	36
Mitella nuda	2	36
Eurybia macrophylla	8	30
Galium sp.	3	30
Athyrium filix-femina	2	23
Maianthemum trifolium	2	21
Herb Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(16 18 36 50 70)**	
Bryophytes and Lichens		
Pleurozium schreberi	20	98
Ptilium crista-castrensis	6	73
Dicranum sp.	3	66
Sphagnum sp.	8	57
Polytrichum sp.	3	55
Cladonia sp.	3	54
Hylocomium splendens	7	50
Cladina rangiferina	2	43
Sphagnum girgensohnii	6	27
Cladina mitis	2	27
Mnium sp.	4	25
Sphagnum magellanicum	3	21
Bryo-Lichen Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(5 16 42 70 90)**	

* 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)

ISSN 1916-3266

Forest / Forêt **Association CNVC00296**

Picea mariana – Abies balsamea / Alnus incana

Black Spruce – Balsam Fir / Speckled Alder

Épinette noire – Sapin baumier / Aulne rugueux

Site / Soil Characteristics

	Association CNVC00296
	56 plots
Elevation Range (min–mean–max meters)	
	100–308–610
	missing data (2)
Slope Gradient (% frequency)	
	moderately steep (4)
	moderate (7)
	gentle (20)
	level (64)
	missing data (5)
Aspect (% frequency)	
	north (5)
	east (9)
	south (13)
	west (16)
	level (57)
Meso Topoposition (% frequency)	
	crest / upper (5)
	mid (16)
	lower / toe (13)
	depression (9)
	level (57)
Moisture Regime (% frequency)	
	dry (2)
	mesic (20)
	moist (50)
	wet (29)
Nutrient Regime (% frequency)	
	missing data (100)

Picea mariana – Abies balsamea / Alnus incana CNVC00296

Site / Soil Characteristics (cont'd)

	Association CNVC00296
Soil Parent Material (% frequency)	
	colluvium (4)
	moraine / till (25)
	lacustrine (9)
	glaciolacustrine (41)
	marine (2)
	organic (20)
Soil Rooting Zone Substrate (% frequency)	
	non-soil (4)
	coarse loamy (7)
	fine loamy (2)
	clayey (18)
	organic (20)
	missing data (50)
Root Restricting Depth (% frequency)	
	0 – 20 cm (4)
	21 – 99 cm (55)
	≥ 100 cm (13)
	missing data (29)
Humus Form (% frequency)	
	mor (50)
	moder (16)
	peatymor (34)

Forest / Forêt **Association CNVC00296**

Picea mariana – Abies balsamea / Alnus incana

Black Spruce – Balsam Fir / Speckled Alder

Épinette noire – Sapin baumier / Aulne rugueux

Additional Characteristics

Species of High Conservation Concern:

Non-native Species:

Management Issues:

Type Statistics

Internal Similarity: **Confidence:**

Strength:

Related Concepts

Similar CNVC Associations:

CNVC00217 [*Picea mariana – Abies balsamea / Rhododendron groenlandicum / Pleurozium schreberi*] occurs on mesic, nutrient-medium sites in the same range and lacks a tall shrub layer of *Alnus incana*.

CNVC00277 [*Picea mariana – Abies balsamea / Pleurozium schreberi – Sphagnum* spp.] occurs in Quebec on sites that are moist but not as rich. It lacks a tall shrub layer of *Alnus incana* and has greater *Sphagnum* moss cover.

CNVC00295 [*Picea mariana / Alnus incana / Pleurozium schreberi*] occurs on comparable sites in the same range but does not have *Abies balsamea* codominant in the canopy (see Dynamics).

CNVC00297 [*Abies balsamea / Alnus incana*] occurs on comparable sites in the same range but has a canopy with little to no *Picea mariana*.

CNV00351 [*Picea mariana – Abies balsamea / Pleurozium schreberi (Hylocomium splendens)*] occurs on mesic, nutrient-medium sites in Quebec and lacks a tall shrub layer of *Alnus incana*.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

Comments

Alnus incana here refers to ssp. *rugosa* (speckled alder).

Picea mariana – Abies balsamea / Alnus incana CNVC00296

Source Information

Number of source plots for CNVC00296: 56

Information Sources:

McMurray, S.C., Johnson, J.A., Zhou, K., Uhlig, P.W.C. 2015. Ontario ecological land classification program - Ecological Data Repository (EDR). Ont. Min. Nat. Resour. & For., Sci.& Info. Branch, Sault Ste. Marie, ON.

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Concept Authors: K. Baldwin, K. Chapman, M. Major, C. Morneau, P. Uhlig, M. Wester

Description Authors: K. Chapman and K. Baldwin

Date of Concept: December, 2013

Date of Description: December, 2016

Classification References:

Bergeron, J-F.; Grondin, P.; Blouin, J. 1999. Rapport de classification écologique du sous-domaine bioclimatique de la pessière à mousses de l'ouest. Min. des Res. nat. du Qué, Dir. des inv. for., Sainte-Foy, QC.

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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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Picea mariana – Abies balsamea / Alnus incana CNVC00296

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.

Suggested Citation: K. Chapman and K. Baldwin. *Picea mariana – Abies balsamea / Alnus incana* [online]. Sault Ste. Marie, Ontario, Canada: Canadian National Vegetation Classification. December, 2016; generated May-09-2017; cited ENTER DATE ACCESSED. 10 p. Canadian National Vegetation Classification Association: CNVC00296. Available from http://cnvc-cnvc/ca. System Requirements: Adobe Acrobat Reader v. 7.0 or higher. ISSN 1916-3266.