



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

<http://cnvc-cnvc.ca>

**Wetland / Tourbière boisée**

**Association CNVC00283**

***Picea mariana* / *Chamaedaphne calyculata* – *Vaccinium angustifolium* / *Sphagnum* spp.**

**Black Spruce / Leatherleaf – Early Lowbush Blueberry / Peat Mosses**

**Épinette noire / Cassandre caliculé – Bleuets à feuilles étroites / Sphaignes**

**Subassociations:** none

**CNVC Alliance:** CA00043 *Picea mariana* / *Chamaedaphne calyculata* – *Vaccinium angustifolium* / *Sphagnum fuscum*

**CNVC Group:** CG0019 Ontario-Quebec Boreal Black Spruce Poor – Intermediate Treed Wetland



Source: Natural Resources Canada - Canadian Forest Service

## Type Description

**Concept:** CNVC00283 is a boreal wetland coniferous woodland Association that ranges from Manitoba to Quebec. It has an open tree layer of stunted (usually <10m height), narrow-crowned black spruce (*Picea mariana*). The understory is species poor, with a preponderance of ericaceous species. The dense shrub layer comprises black spruce of various ages as well as abundant common Labrador tea (*Rhododendron groenlandicum*) and leatherleaf (*Chamaedaphne calyculata*) and less abundant pale bog laurel (*Kalmia polifolia*), velvet-leaved blueberry (*Vaccinium myrtilloides*) and early lowbush blueberry (*V. angustifolium*). In the Quebec portion of the range, sheep laurel (*K. angustifolia*) is also common. Herbs and dwarf shrubs are usually sparse, but creeping snowberry (*Gaultheria hispidula*), three-leaved false Solomon's seal (*Maianthemum trifolium*) and cloudberry (*Rubus chamaemorus*) are typically present. The moss layer is continuous and dominated by peat mosses (*Sphagnum* spp.), but red-stemmed feathermoss (*Pleurozium schreberi*) and reindeer lichens (*Cladina* spp.) are common on dry microsities (e.g., peat hummocks). CNVC00283 occurs on wet, acidic, nutrient-poor sites in a region with a boreal continental climate that grades from subhumid in the west to humid in the east. Substrates are usually deep (>40 cm) organic soils formed from slowly decomposing *Sphagnum* and other mosses. Although fire can occasionally occur, this is typically a stable condition that is maintained by a persistently high water table and poor nutrient conditions; local hydrology is the main driver of vegetation dynamics.

**Vegetation:** CNVC00283 is a coniferous woodland Association with an open tree layer of typically stunted (<10m height) *Picea mariana*. Generally, the species present in CNVC00283 are tolerant of wet, acidic substrates and poor nutrient status. The shrub layer is dense but species poor, primarily consisting of abundant *Rhododendron groenlandicum*, *Chamaedaphne calyculata* and *P. mariana* of various heights and ages. *Kalmia polifolia*, *Vaccinium myrtilloides*, *V. angustifolium*, and in the Quebec portion of the range, *K. angustifolia*, are also common. The herb and dwarf shrub layer is sparse and usually includes *Gaultheria hispidula*, *Maianthemum trifolium* and *Rubus chamaemorus*. *Vaccinium oxycoccos* and/or *V. macrocarpon* can be present. The continuous moss layer is dominated by *Sphagnum* spp. (most often *S. fuscum*, but also *S. girgensohnii*, *S. magellanicum*, *S. angustifolium* and *S. capillifolium*). Some of these species form dense hummocks with dry exposed tops that are covered by *Pleurozium schreberi*. *Cladina* spp. and other lichens are present on the driest of these microsities.

		Soil Nutrient Regime		
		Poor	Medium	Rich
Soil Moisture Regime	Dry			
	Mesic			
	Moist			
	Wet			



***Picea mariana* / *Chamaedaphne calyculata* – *Vaccinium angustifolium* / *Sphagnum* spp.  
CNVC00283**

### Type Description (cont'd)

**Environment:** CNVC00283 is a peatland Association; it occurs on wet, nutrient-poor sites in a region with a boreal continental climate that grades from subhumid in the west to humid in the east. Substrates are usually deep (> 40 cm) organic soils, formed from slowly decomposing *Sphagnum* and other mosses. Surface microtopography is hummocky. The peat surface is typically at the level of, or even above, the surrounding terrain, so it is possible that the rooting layer may not be in contact with groundwater at any time during the growing season. These sites are acidic (pH is usually < 4.7) because of isolation from mineral-enriched (minerotrophic) groundwater, as well as from the influence of *Sphagnum* mosses, which tend to acidify their environment. Nutrient inputs to the rooting layer are minimal; sources are essentially precipitation, dustfall and the capillary action of peat. CNVC00283 often occurs in large wetland complexes with open bog and fen conditions (M876 [North American Boreal & Sub-boreal Acidic Bog & Fen]; M877 [North American Boreal & Sub-boreal Alkaline Fen]) as well as slightly more productive wetland forests (e.g., CNVC00282 [*Picea mariana* / *Rhododendron groenlandicum* – *Kalmia angustifolia* / *Sphagnum* spp.]).

**Dynamics:** CNVC00283 is a stable condition that is maintained by a persistently high water table, an acidic substrate and poor nutrient status. Local hydrology is the main driver of vegetation dynamics. Although fires occur on peatlands, they are infrequent and of limited extent because these sites are so wet. Consequently, stands of CNVC00283 tend to be long lived and multi-aged, with trees up to or exceeding 200 years. *Picea mariana* can establish from seed under favourable conditions (e.g., suitable seedbed) but typically self-replaces on these sites by vegetative layering.

Because of limited groundwater inputs and a cold climate, decomposition is slow, and peat accumulates over time. In the absence of hydrological changes, this process can raise the rooting zone above the water table, which further reduces nutrient availability for tree growth, and promotes succession to less productive, open bog conditions.

Long-term change in the water table (either by anthropogenic activities or natural causes [e.g., beaver dams]) usually results in changes to the vegetation community. A rise in the water table can result in tree mortality and transition to open wetland vegetation. A drop in the water table can sometimes result in the development of more productive feathermoss forests (e.g., CNVC00276 [*Picea mariana* / *Rhododendron groenlandicum* – *Vaccinium angustifolium* / *Pleurozium schreberi* (*Sphagnum* spp.)]). Enrichment of the rooting layer, typically by groundwater flow, can stimulate development of more productive wetland forest conditions (e.g., CNVC00298 [*Picea mariana* / *Alnus incana* / *Gaultheria hispidula* / *Sphagnum* spp.]) by increasing supplies of oxygen and macronutrients, and by reducing acidity.

**Range:** CNVC00283 occurs in the boreal region of Quebec and Ontario and likely extends into southeastern Manitoba as far west as Lake Winnipeg. In Quebec, it ranges east to the Lower North Shore of the Gulf of Saint Lawrence.

### 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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**Épinette noire / Cassandre caliculé – Bleuets à feuilles étroites / Sphaignes**

## Distribution

**Countries:** Canada

**Provinces / Territories / States:** Manitoba, Ontario, Quebec

**Terrestrial Ecozones and Ecoregions of Canada:** Boreal Shield: Abitibi Plains, Central Laurentians, Lac Seul Upland, Lake Nipigon, Lake of the Woods, Lake Timiskaming Lowland, Mecatina Plateau, Rivière Rupert Plateau, Southern Laurentians, Thunder Bay-Quetico; Hudson Plains: James Bay Lowland; Taiga Shield: Mecatina River

**Rowe's Forest Regions and Sections of Canada:** Boreal: Central Plateau, Chibougamau-Natashquan, East James Bay, Gouin, Hudson Bay Lowlands, Laurentide-Onatchiway, Lower English River, Missinaibi-Cabonga, Northeastern Transition, Northern Clay, Northern Coniferous, Superior, Upper English River; Great Lakes-St. Lawrence: Algonquin-Pontiac, Middle Ottawa, Quetico

**NAAEC CEC Ecoregions of North America (Levels I & II):** Hudson Plains; Northern Forests: Mixed Wood Shield, Softwood Shield; Taiga: Taiga Shield

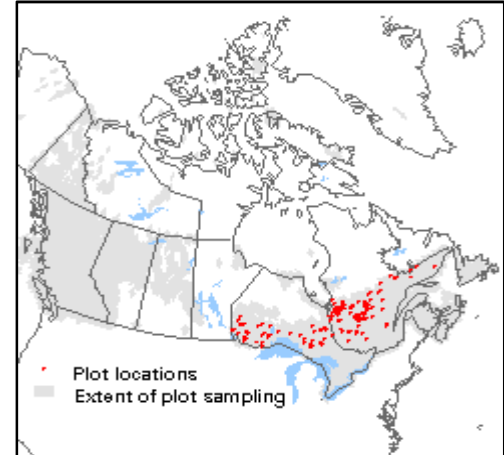
**Nature Conservancy of Canada Ecoregions:** Boreal Shield, Eastern Taiga Shield, Great Lakes, Hudson Plains, Superior-Lake of the Woods

**Ecozones and Ecoregions of Manitoba:** Boreal Shield

**Manitoba Protected Areas Initiative Natural Regions:** Manitoba Lowlands: Lake of the Woods; Precambrian Boreal Forest: Lac Seul Upland

**Ecological Land Classification of Ontario (ecoregions and ecodistricts):** 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, 4E-1, 4E-3, 4E-4, 4E-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:** 3 Ouest, 4 Ouest, 5 Est, 5 Ouest, 6 Est, 6 Ouest, 7



## Corresponding Types and Associations

CNVC00283	Ontario	BwTr16-1	<i>Picea mariana</i> / <i>Rhododendron groenlandicum</i> - <i>Chamaedaphne calyculata</i> - <i>Vaccinium angustifolium</i> / <i>Sphagnum</i> spp. Woodland
	Quebec	QC037B	<i>Picea mariana</i> / <i>Ledum groenlandicum</i> / <i>Sphagnum</i> spp. [ <i>Chamaedaphne calyculata</i> ]



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## Vegetation Summary\*

Species Name <sup>†</sup>	Association CNVC00283	
	163 plots	
	% Cover <sup>‡</sup>	% Presence <sup>^</sup>
<b>Overstory Trees</b>		
<i>Picea mariana</i>	23	92
Tree Stratum Cover (P <sub>10</sub> P <sub>25</sub> Mean P <sub>75</sub> P <sub>90</sub> ) <sup>‡</sup>	(4 12 25 32 49)	
<b>Understory Woody Shrubs and Regenerating Trees</b>		
<i>Rhododendron groenlandicum</i>	29	100
<i>Picea mariana</i>	27	100
<b><i>Chamaedaphne calyculata</i></b>	<b>34</b>	<b>99</b>
<i>Kalmia polifolia</i>	3	77
<i>Vaccinium myrtilloides</i>	7	71
<b><i>Vaccinium angustifolium</i></b>	<b>5</b>	<b>63</b>
<i>Kalmia angustifolia</i>	8	47
<i>Larix laricina</i>	4	40
<i>Andromeda polifolia</i>	2	28
Shrub Stratum Cover (P <sub>10</sub> P <sub>25</sub> Mean P <sub>75</sub> P <sub>90</sub> ) <sup>‡</sup>	(45 74 83 99 99)	
<b>Understory Herbs and Dwarf Shrubs</b>		
<i>Gaultheria hispidula</i>	3	92
<i>Maianthemum trifolium</i>	4	87
<i>Rubus chamaemorus</i>	11	64
<i>Vaccinium oxycoccos</i>	3	52
<i>Carex</i> sp.	4	50
<i>Vaccinium macrocarpon</i>	1	34
<i>Coptis trifolia</i>	2	29
<i>Lycopodium annotinum</i>	2	28
<i>Cornus canadensis</i>	3	26
<i>Equisetum sylvaticum</i>	6	25
<i>Geocaulon lividum</i>	2	25
<i>Carex trisperma</i>	4	22
Herb Stratum Cover (P <sub>10</sub> P <sub>25</sub> Mean P <sub>75</sub> P <sub>90</sub> ) <sup>‡</sup>	(3 10 18 26 33)	
<b>Bryophytes and Lichens</b>		
<i>Pleurozium schreberi</i>	15	99
<b><i>Sphagnum fuscum</i></b>	<b>23</b>	<b>83</b>
<i>Cladina rangiferina</i>	6	81
<b><i>Sphagnum girgensohnii</i></b>	<b>19</b>	<b>56</b>
<b><i>Sphagnum magellanicum</i></b>	<b>15</b>	<b>55</b>
<b><i>Sphagnum</i> sp.</b>	<b>49</b>	<b>54</b>
<i>Dicranum</i> sp.	3	46



***Picea mariana* / *Chamaedaphne calyculata* – *Vaccinium angustifolium* / *Sphagnum* spp.  
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**Vegetation Summary (cont'd)\***

Species Name <sup>†</sup>	Association CNVC00283	
	Cover <sup>‡</sup>	Presence <sup>^</sup>
<i>Cladina stellaris</i>	5	44
<i>Cladina mitis</i>	3	42
<i>Ptilium crista-castrensis</i>	3	39
<i>Cladonia</i> sp.	2	39
<i>Ptilidium ciliare</i>	2	31
<b><i>Sphagnum angustifolium</i></b>	<b>24</b>	<b>26</b>
<i>Dicranum polysetum</i>	2	26
<b><i>Sphagnum capillifolium</i></b>	<b>12</b>	<b>25</b>
<i>Polytrichum</i> sp.	3	25
<b>Bryo-Lichen Stratum Cover</b> (P <sub>10</sub> P <sub>25</sub> Mean P <sub>75</sub> P <sub>90</sub> ) <sup>‡</sup>	<b>(90 90 91 94 99)</b>	

\* species present in > 20% of sample plots are listed

<sup>†</sup> see **Botanical Nomenclature** link at <http://cnvc-cnvc.ca> for botanical sources, synonyms and common names

<sup>‡</sup> average percent cover of a species within the plots in which it occurs (i.e., characteristic cover)

<sup>^</sup> percent frequency occurrence for a species within the total plots

<sup>‡</sup> P<sub>x</sub> = X<sup>th</sup> percentile (e.g., P<sub>10</sub> = 10<sup>th</sup> percentile)



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## Site / Soil Characteristics

Association  
CNVC00283  
163 plots

### Elevation Range (min–mean–max meters)

70–365–835

### Slope Gradient (% frequency)

moderate (1)  
gentle (2)  
**level (90)**  
missing data (7)

### Aspect (% frequency)

north (4)  
east (2)  
south (4)  
west (5)  
**level (82)**  
missing data (3)

### Meso Toposition (% frequency)

crest / upper (2)  
mid (6)  
lower / toe (6)  
depression (12)  
**level (74)**

### Moisture Regime (% frequency)

mesic (1)  
moist (9)  
**wet (91)**

### Nutrient Regime (% frequency)

missing data (100)



*Picea mariana* / *Chamaedaphne calyculata* – *Vaccinium angustifolium* / *Sphagnum* spp.  
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**Site / Soil Characteristics (cont'd)**

Association  
CNVC00283

**Soil Parent Material (% frequency)**

moraine / till (5)  
glaciofluvial (3)  
glaciolacustrine (9)  
marine (1)  
**organic (76)**  
missing data (7)

**Soil Rooting Zone Substrate (% frequency)**

sandy (1)  
coarse loamy (1)  
fine loamy (2)  
**organic (83)**  
missing data (13)

**Root Restricting Depth (% frequency)**

0 – 20 cm (10)  
21 – 99 cm (28)  
≥ 100 cm (9)  
missing data (54)

**Humus Form (% frequency)**

mor (6)  
**peatymor (91)**  
missing data (3)



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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:

CNVC00112 [*Picea mariana* / *Vaccinium vitis-idaea* / *Sphagnum* spp.] is a similar woodland condition that occurs on comparable boreal sites from British Columbia to northwestern Ontario. It has much more *Vaccinium vitis-idaea* and lower constancy and abundance of *Chamaedaphne calyculata*, *V. myrtilloides*, *V. angustifolium* and *Kalmia polifolia*.

CNVC00276 [*Picea mariana* / *Rhododendron groenlandicum* – *Vaccinium angustifolium* / *Pleurozium schreberi* (*Sphagnum* spp.)] occurs in the same range on sites that are neither as wet nor as poor. It has a forest physiognomy and a moss layer with greater cover of *Pleurozium schreberi* and less of *Sphagnum* mosses. It lacks wetland species like *Chamaedaphne calyculata*, *Kalmia polifolia*, *Maianthemum trifolium*, *Rubus chamaemorus* and *Vaccinium oxycoccus* (see Dynamics).

CNVC00282 [*Picea mariana* / *Rhododendron groenlandicum* – *Kalmia angustifolia* / *Sphagnum* spp.] is a slightly more productive condition with a forest physiognomy that occurs on comparable sites from southeastern Manitoba to Quebec. It has a similar floristic composition but lower constancy and cover of *Chamaedaphne calyculata* (see Environment).

CNVC00288 [*Picea mariana* – *Larix laricina* / *Rhododendron groenlandicum* / *Gaultheria hispidula* / *Sphagnum* spp.] occurs in the same range on sites that are not quite as poor. It has a forest physiognomy with *Larix laricina* codominant with *Picea mariana*.

CNVC00298 [*Picea mariana* / *Alnus incana* / *Gaultheria hispidula* / *Sphagnum* spp.] occurs on wet, nutrient-medium to rich sites in the same range. It has a forest physiognomy and a shrub layer with abundant *Alnus incana* and much less cover of ericaceous species (see Dynamics).

CNVC00335 [*Picea mariana* / *Kalmia angustifolia* / *Pleurozium schreberi* – *Sphagnum capillifolium*] is a slightly more productive condition with a forest physiognomy that occurs on comparable boreal sites on insular Newfoundland. It has more *Abies balsamea* and *Kalmia angustifolia* and much less *Chamaedaphne calyculata*, *Rhododendron groenlandicum* and *Vaccinium myrtilloides*.

CNVC00339 [*Picea mariana* – *Kalmia angustifolia* – *Ilex mucronata* / *Sphagnum* spp. – *Cladina* spp. – *Pleurozium schreberi*] occurs on comparable wind-exposed boreal sites on Cape Breton Island, Nova Scotia and insular Newfoundland. It has a krummholtz physiognomy with more *Abies balsamea*, *Ilex mucronata*, *Kalmia angustifolia*, *Rhododendron canadense* and *Viburnum nudum* in the shrub layer.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

## Comments

CNVC00283 is consistent with the concept of a treed bog in the Canadian Wetland Classification System. It is the poorest wet woodland in its range.





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### **Source Information**

**Number of source plots for CNVC00283:** 163

#### **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.

Ministère des Ressources naturelles, de la Faune et des Parcs, Forêt Québec. 2003. Base de données des points d'observation écologique (version 2003). Gouv. du Qué., Min. des Res. nat., de la Faune et des Parcs, Forêt Qué., Dir. des inv. for., QC.

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

**Description Authors:** K. Baldwin and K. Chapman

**Date of Concept:** December, 2012

**Date of Description:** November, 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.

Uhlig, P.W.C., Chapman, K., Baldwin, K., Wester, M., Yanni, S. 2016. Draft boreal treed vegetation type factsheets. Ecol. Land Class. Prog., Ont. Min. Nat. Resour. & For., Sci. & Info Branch, Sault Ste. Marie, ON.

### **Characterization References:**

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.

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Riley, J.L.; Michaud, L. 1989. Peat and peatland resources of northwestern Ontario. Min. North. Dev. & Mines, Ont. Geol. Surv., ON. Misc. Paper 144.

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CNVC00283**

**Characterization References (cont'd):**

Simard, M.; Lecomte, N.; Bergeron, Y.; Bernier, P.Y.; Paré, D. 2007. Forest productivity decline caused by successional paludification of boreal soils. *Ecol. Appl.* 17(6):1619-1637.

Zoladeski, C.A.; Wickware, G.M.; Delorme, R.J.; Sims, R.A.; Corns, I.G.W. 1995. Forest ecosystem classification for Manitoba: field guide. *Nat. Res. Can., Can. For. Serv., North. For. Centre, Edmonton, AB. Special Rep. 2.*

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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