Wetland **Association CNVC00339**

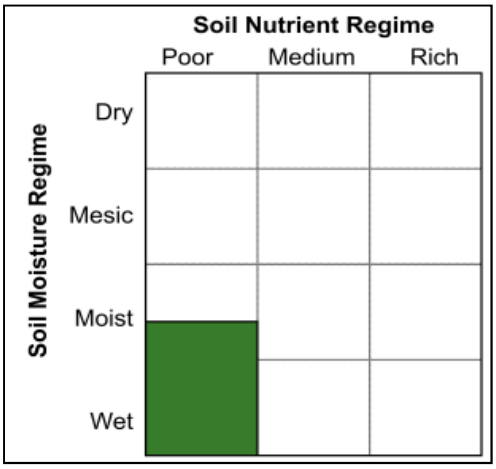
Picea mariana – Kalmia angustifolia – Ilex mucronata / Sphagnum spp. *– Cladina* spp. *– Pleurozium schreberi*

Black Spruce – Sheep Laurel – Mountain Holly / Peat Mosses – Reindeer Lichens – Red-stemmed Feathermoss

Épinette noire – Kalmia à feuilles étroites – Némopanthe mucroné / Sphaignes – Cladonies – Pleurozie

Subassociations: *339a Cladina spp, 339b Sphagnum subsecundum*
CNVC Alliance: CA00040 *Picea mariana (Abies balsamea) / Kalmia angustifolia / Sphagnum capillifolium*
CNVC Group: CG0016 Atlantic Boreal Black Spruce – Balsam Fir Poor – Intermediate Treed Wetland

Source: B. Meades



Type Description

Concept: CNVC00339 is a boreal, wetland, coniferous, krummholtz Association that occurs on the Cape Breton plateau of Nova Scotia and throughout the southern parts of insular Newfoundland. It is dominated by black spruce (*Picea mariana*) with sporadic balsam fir (*Abies balsamea*), together forming a dense shrub stratum. Mountain holly (*Ilex mucronata*) and wild raisin (*Viburnum nudum*) are also common in this layer. The dense low shrub layer is dominated by ericaceous species, particularly sheep laurel (*Kalmia angustifolia*), early lowbush blueberry (*Vaccinium angustifolium*), common Labrador tea (*Rhododendron groenlandicum*) and rhodora (*R. canadense*), intermixed with vegetative black spruce regeneration. The herb layer is moderately developed with only bunchberry (*Cornus canadensis*) and creeping snowberry (*Gaultheria hispidula*) common. The moss layer is moderately developed to continuous, formed by a mixture of the feathermosses, red-stemmed feathermoss (*Pleurozium schreberi*) and stairstep moss (*Hylocomium splendens*), with large patches of peat mosses (*Sphagnum* spp.), especially small red peat moss (*S. capillifolium*) or orange peat moss (*S. subsecundum*), and reindeer lichens (*Cladina* spp.). CNVC00339 is a stable condition that occurs in a very humid maritime boreal climate on wet, acidic, nutrient-poor soils. The krummholtz physiognomy results from the combination of wet soils, high precipitation and strong winds that characterize the coastal maritime environment. Snow pack depth further limits tree height; canopy height is typically < 4 m. There are two subassociations, *Cladina spp.* and *Sphagnum subsecundum*.

Vegetation: CNVC00339 is a coniferous krummholtz Association. Its most distinctive feature is the absence of a tree layer (i.e., > 5 m in height) and the overall appearance of a low, impenetrable coniferous thicket. *Picea mariana* dominates, with occasional *Abies balsamea,* forming a dense coniferous canopy < 4 m in height. *Ilex mucronata* and *Viburnum nudum* (see Comments) occur frequently but with low abundance in the shrub layer. The ericaceous species *Kalmia angustifolia, Vaccinium angustifolium*, *Rhododendron groenlandicum* and *R. canadense,* along with regenerating *P. mariana,* form a dense low shrub layer. The herb layer is moderately developed with only *Cornus canadensis* and *Gaultheria hispidula* common. The moss layer is formed by large patches of *Pleurozium schreberi* and *Hylocomium splendens* along with patches of *Sphagnum capillifolium* or *S. subsecundum*. The liverworts *Bazzania trilobata* and *Ptilidium ciliare,* as well as *Cladina* lichens, are common in small patches**.**

Two subassociations are recognized, *Cladina spp.* and *Sphagnum subsecundum*. The *Cladina spp.* subassociation is distinguished by presence of *Empetrum nigrum* and *Cladina* lichens (particularly *C. rangiferina, C. arbuscula, C. mitis* and *C. stellaris*). The *Sphagnum subsecundum* subassociation is distinguished by the occurrence of *Epigaea repens*, *Coptis trifolia*, *Rubus chamaemorus* and *S. subsecundum.*

Picea mariana – Kalmia angustifolia – Ilex mucronata / Sphagnum spp. *– Cladina* spp. *– Pleurozium schreberi* CNVC00339

Type Description (cont'd)

Environment: CNVC00339 occurs in a very humid maritime boreal climate in coastal or highland areas that are characterized by extreme wind exposure and high precipitation (including high snowfall). The combination of exposure, wet soils and persistence and depth of snow cover determine tree height. Overall tree heights tend to be greater on Cape Breton Island (up to 4 m in subassociation *Sphagnum subsecundum*) than on Newfoundland (rarely > 2 m in subassociation *Cladina spp.*). CNVC00339 usually occurs in the narrow transition between upland forests and open bogs, but it can form extensive stands in gently rolling landscapes where the transition from blanket bogs is very gradual. Soils are moist to wet, acidic and nutrient-poor. Mineral soils are gleyed with the depth of the water table fluctuating near the surface. The surface organic layer includes a mix of acidic ericaceous mor and *Sphagnum* peatymor humus forms, usually 10-30 cm deep in the *Cladina spp.* subassociation and up to about 1m in the *Sphagnum subsecundum* subassociation.

Dynamics: CNVC00339 is a stable condition that is maintained by extreme wind exposure, a persistently high water table, an acidic substrate and poor nutrient status. Fire rarely occurs because of the humid climate and wet soils. Consequently, stands of CNVC00339 tend to be long lived and multi-aged, with *Picea mariana* up to or exceeding 200 years. This Association is highly resilient to disturbance because *P. mariana* is able to regenerate rapidly by vegetative layering. Mitigation of wind exposure could lead to the development of a stand structure and composition that is comparable to that of CNVC00335 [*Picea mariana / Kalmia angustifolia / Pleurozium schreberi – Sphagnum capillifolium*].

Range: CNVC00339 occurs in southern areas of insular Newfoundland and on the boreal highlands of Cape Breton Island, Nova Scotia. The *Cladina spp.* subassociation is described from Newfoundland and the *Sphagnum subsecundum* subassociation from Cape Breton Island.

Conservation Status (NatureServe)

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

Wetland **Association CNVC00339**

Picea mariana – Kalmia angustifolia – Ilex mucronata / *Sphagnum* spp. – *Cladina* spp. – *Pleurozium schreberi*

Black Spruce – Sheep Laurel – Mountain Holly / Peat Mosses – Reindeer Lichens – Red-stemmed Feathermoss

Épinette noire – Kalmia à feuilles étroites – Némopanthe mucroné / Sphaignes – Cladonies – Pleurozie

Distribution

Countries: Canada

Provinces / Territories / States: Newfoundland and Labrador, Nova Scotia

Terrestrial Ecozones and Ecoregions of Canada: Atlantic Maritime: Cape Breton Highlands; Boreal Shield: Avalon Forest, Maritime Barrens

Rowe's Forest Regions and Sections of Canada: Acadian: Cape Breton Plateau; Boreal: Avalon, Newfoundland-Labrador Barrens

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

Nature Conservancy of Canada Ecoregions: Boreal Shield, Northern Appalachians-Acadia

Ecological Land Classification of Nova Scotia (ecozones and ecoregions): Atlantic Maritime: Northern Plateau

Ecoregions of Newfoundland: Avalon Forest, Maritime Barrens

Corresponding Types and Associations

339a Cladina spp.	Newfoundland and Labrador	E KPn	Eastern: Nemopanthus - Kalmia - black spruce forest
339b Sphagnum subsecundum	Maritimes Region	A036-u	Picea mariana - Rhododendron canadensis / Dicranum majus - Sphagnum subsecundum Woodland-Shrubland

Wetland **Association CNVC00339**

Picea mariana – Kalmia angustifolia – Ilex mucronata / *Sphagnum* spp. – *Cladina* spp. – *Pleurozium schreberi*

Black Spruce – Sheep Laurel – Mountain Holly / Peat Mosses – Reindeer Lichens – Red-stemmed Feathermoss

Épinette noire – Kalmia à feuilles étroites – Némopanthe mucroné / Sphaignes – Cladonies – Pleurozie

Vegetation Summary*

	Association CNVC00339		Subassociation 339a *Cladina spp.*		Subassociation 339b *Sphagnum subsecundum*	
	9 plots		4 plots		5 plots	
Species Name†	% Cover±	% Presence^	% Cover±	% Presence^	% Cover±	% Presence^
Overstory Trees						
Tree Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(0 0 0 0 0)**		**(0 0 0 0 0)**		**(0 0 0 0 0)**	
Understory Woody Shrubs and Regenerating Trees						
Ilex mucronata	**15**	**100**	**15**	**100**	**15**	**100**
Abies balsamea	11	100	11	100	12	100
Viburnum nudum	10	100	14	100	6	100
Vaccinium angustifolium	7	100	7	100	7	100
Picea mariana	**83**	**89**	**75**	**75**	**88**	**100**
Kalmia angustifolia	**33**	**89**	**44**	**100**	**22**	**80**
Rhododendron canadense	20	67	19	25	20	100
Amelanchier bartramiana	12	67	2	25	13	100
Rhododendron groenlandicum	6	67	7	75	4	60
Larix laricina	6	33	6	75	-	-
Taxus canadensis	5	33	-	-	5	60
Sorbus decora	< 1	33	-	-	< 1	60
Viburnum edule	< 1	22	-	-	< 1	40
Juniperus communis	4	11	4	25	-	-
Rubus idaeus	1	11	1	25	-	-
Shrub Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(68 72 83 100 100)**		**(100 100 100 100 100)**		**(66 70 70 72 74)**	
Understory Herbs and Dwarf Shrubs						
Cornus canadensis	5	100	1	100	8	100
Gaultheria hispidula	3	100	3	100	3	100
Clintonia borealis	5	67	4	25	5	100
Coptis trifolia	4	56	-	-	4	100
Carex trisperma	3	56	3	50	3	60
Epigaea repens	3	56	-	-	3	100
Maianthemum canadense	1	56	1	25	1	80
Linnaea borealis	2	44	5	25	2	60
Osmundastrum cinnamomeum	2	44	4	50	1	40
Empetrum nigrum	16	33	16	75	-	-
Rubus chamaemorus	2	33	-	-	2	60
Vaccinium oxycoccos	2	22	2	50	-	-
Lysimachia borealis	1	22	-	-	1	40
Solidago macrophylla	1	22	-	-	1	40

Picea mariana – Kalmia angustifolia – Ilex mucronata / Sphagnum spp. – *Cladina* spp. – *Pleurozium schreberi* CNVC00339

Vegetation Summary (cont'd)*

	Association CNVC00339		Subassociation 339a *Cladina spp.*		Subassociation 339b *Sphagnum subsecundum*	
Species Name[†]	% Cover[±]	% Presence^	% Cover[±]	% Presence^	% Cover[±]	% Presence^
Aralia nudicaulis	< 1	22	-	-	< 1	40
Orthilia secunda	2	11	2	25	-	-
Herb Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(13 18 26 37 39)**		**(12 13 23 27 38)**		**(20 23 29 37 38)**	
Bryophytes and Lichens						
Pleurozium schreberi	**29**	**100**	**29**	**100**	**29**	**100**
Hylocomium splendens	12	89	19	75	7	100
Ptilidium ciliare	2	89	5	75	1	100
Bazzania trilobata	9	78	4	50	11	100
Sphagnum capillifolium	**18**	**67**	**26**	**100**	**1**	**40**
Ptilium crista-castrensis	5	67	9	25	4	100
Dicranum majus	4	67	9	25	3	100
Sphagnum subsecundum	26	56	-	-	**26**	**100**
Cladina rangiferina	**29**	**44**	**29**	**100**	**-**	**-**
Cladina arbuscula	**24**	**44**	**24**	**100**	**-**	**-**
Cladina mitis	**17**	**44**	**17**	**100**	**-**	**-**
Dicranum fuscescens	1	44	-	-	1	80
Cladina stellaris	**9**	**33**	**9**	**75**	**-**	**-**
Dicranum polysetum	7	33	7	75	-	-
Cladonia sp.	2	33	2	75	-	-
Hypnum pallescens	1	33	-	-	1	60
Sphagnum magellanicum	**3**	**22**	**-**	**-**	**3**	**40**
Brachythecium starkei	1	22	-	-	1	40
Sphagnum quinquefarium	**19**	**11**	**19**	**25**	**-**	**-**
Usnea longissima	9	11	9	25	-	-
Dicranum undulatum	4	11	4	25	-	-
Racomitrium lanuginosum	4	11	4	25	-	-
Hypogymnia physodes	2	11	2	25	-	-
Alectoria sarmentosa	1	11	1	25	-	-
Bryoria sp.	1	11	1	25	-	-
Platismatia glauca	1	11	1	25	-	-
Polytrichum commune	1	11	1	25	-	-
Bryo-Lichen Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(34 37 65 100 100)**		**(100 100 100 100 100)**		**(31 35 36 40 41)**	

* 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

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Black Spruce – Sheep Laurel – Mountain Holly / Peat Mosses – Reindeer Lichens – Red-stemmed Feathermoss

Épinette noire – Kalmia à feuilles étroites – Némopanthe mucroné / Sphaignes – Cladonies – Pleurozie

Site / Soil Characteristics

	Association CNVC00339	Subassociation 339a *Cladina spp.*	Subassociation 339b *Sphagnum subsecundum*
	9 plots	**4 plots**	**5 plots**
Elevation Range (min–mean–max meters)			
	122–329–472	122–150–217	472–472–472
Slope Gradient (% frequency)			
	moderately steep (11) gentle (33) **level (56)**	moderately steep (25) **gentle (75)** level (0)	moderately steep (0) gentle (0) **level (100)**
Aspect (% frequency)			
	east (11) south (22) west (11) **level (56)**	east (25) **south (50)** west (25) level (0)	east (0) south (0) west (0) **level (100)**
Meso Topoposition (% frequency)			
	mid (11) lower / toe (11) **depression (56)** missing data (22)	mid (25) lower / toe (25) depression (0) missing data (50)	mid (0) lower / toe (0) **depression (100)** missing data (0)
Moisture Regime (% frequency)			
	moist (33) **wet (67)**	**moist (75)** wet (25)	moist (0) **wet (100)**
Nutrient Regime (% frequency)			
	poor (56) missing data (44)	poor (0) missing data (100)	**poor (100)** missing data (0)

Picea mariana – Kalmia angustifolia – Ilex mucronata / Sphagnum spp. *– Cladina* spp. *– Pleurozium schreberi* CNVC00339

Site / Soil Characteristics (cont'd)

	Association CNVC00339	Subassociation 339a *Cladina spp.*	Subassociation 339b *Sphagnum subsecundum*
Soil Parent Material (% frequency)			
	colluvium (11) moraine / till (11) missing data (78)	colluvium (25) moraine / till (25) missing data (50)	colluvium (0) moraine / till (0) missing data (100)
Soil Rooting Zone Substrate (% frequency)			
	non-soil (11) missing data (89)	non-soil (25) missing data (75)	non-soil (0) missing data (100)
Root Restricting Depth (% frequency)			
	missing data (100)	missing data (100)	missing data (100)
Humus Form (% frequency)			
	missing data (100)	missing data (100)	missing data (100)

Wetland **Association CNVC00339**

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Black Spruce – Sheep Laurel – Mountain Holly / Peat Mosses – Reindeer Lichens – Red-stemmed Feathermoss

Épinette noire – Kalmia à feuilles étroites – Némopanthe mucroné / Sphaignes – Cladonies – Pleurozie

Additional Characteristics

Species of High Conservation Concern:

Non-native Species:

Management Issues:

Type Statistics

Internal Similarity: **Confidence:**

Strength:

Related Concepts

Similar CNVC Associations:

CNVC00282 [*Picea mariana / Rhododendron groenlandicum – Kalmia angustifolia / Sphagnum* spp.] occurs on comparable, but much less windy, boreal sites from Quebec to eastern Manitoba. It has a forest physiognomy and a shrub layer with less *Abies balsamea, Ilex mucronata, Kalmia angustifolia, Rhododendron canadense* and *Viburnum nudum* and more *R. groenlandicum* and *Vaccinium myrtilloides*.

CNVC00283 [*Picea mariana / Chamaedaphne calyculata – Vaccinium angustifolium/ Sphagnum* spp.] occurs on comparable, but much less windy, boreal sites from Quebec to eastern Manitoba. It has a woodland physiognomy and a shrub layer with less *Abies balsamea, Ilex mucronata, Kalmia angustifolia, Rhododendron canadense* and *Viburnum nudum* and more *Chamaedaphne calyculata, R. groenlandicum* and *Vaccinium myrtilloides*.

CNVC00335 [*Picea mariana / Kalmia angustifolia / Pleurozium schreberi – Sphagnum capillifolium*] occurs on comparable sites on insular Newfoundland. It is floristically similar to CNVC00339 but has a forest physiognomy. These two Associations can occur along a wind exposure gradient in the transition between upland forests and open wetlands. The primary difference is the absence of a tree layer in CNVC00339. Also, the *Cladina spp*. subassociation of CNVC00339 has *Empetrum nigrum* and *Cladina* spp. prominent in the ground layer (see Dynamics).

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

CNVC00339 occurs in Nova Scotia but is not recognized in Neily et al. 2011.

CNVC00339 includes elements of SKn #22 Nemopanthus – Kalmia – Black spruce from Meades & Moores 1994.

Comments

The term krummholtz, used to describe the physiognomy of CNVC00339, derives from the German “krumm,” meaning crooked, bent or twisted, and “holz,” meaning wood. In Newfoundland this condition is commonly referred to as “tuck” or “tuckamore.”

Viburnum nudum here refers to var. *cassinoides* (wild raisin).

Picea mariana – Kalmia angustifolia – Ilex mucronata / *Sphagnum* spp. – *Cladina* spp. – *Pleurozium schreberi* CNVC00339

Source Information

Number of source plots for CNVC00339: 9
Number of source plots for 339a Cladina spp: 4
Number of source plots for 339b Sphagnum subsecundum: 5
Information Sources:

Basquill, S.P. (compiler). 2015. Maritime provinces of Canada regional forest ecosystem plot database. Standardized forest ecosystem plot data compilation and classification from N.B. Dept. Nat. Resour.; P.E.I. For., Fish, & Wildlife Div., Dept. Commun., Land, & Environ.; N.S. Dept. Nat. Resour.; N.S. Environ.; Parks Can.; the Atlantic Can. Conserv. Data Centre; and other sources. Atlantic Can. Conserv. Data Centre, Sackville, NB.

Natural Resources Canada, Canadian Forest Service, Atlantic Region. 2006. Forest vegetation plot descriptions from the following publications: Damman, A.W.H. 1963, 1964, 1967); Meades, W.J. (1976, 1986). Nat. Res. Canada, Corner Brook, NL.

Concept Authors: K. Baldwin, S. Basquill, K. Chapman, B. Meades
Description Authors: B. Meades, K. Chapman, K. Baldwin and S. Basquill
Date of Concept: May, 2012
Date of Description: January, 2017

Classification References:

Basquill, S.; Beaudette, D.; Cameron, R.; Curley, R.; Fenton, N.; Glen, W.; Gordon, S.; Hutchinson, J.; Kelly, G.; Loo, J.; Lynds, A.; MacAskill, D.; MacKinnon, D.; MacQuarrie, K.; Makepeace, S.; Matson, B.; Neily, P.; Quigley, E.; Zelazny, V. 2009 (updated 2015). Forest communities of the Maritime provinces of Canada. Atlantic Canada Conservation Data Centre, Sackville, NB.

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Picea mariana – Kalmia angustifolia – Ilex mucronata / Sphagnum spp. *– Cladina* spp. *– Pleurozium schreberi* CNVC00339

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: B. Meades, K. Chapman, K. Baldwin and S. Basquill. *Picea mariana – Kalmia angustifolia – Ilex mucronata / Sphagnum* spp. *– Cladina* spp. *– Pleurozium schreberi* [online]. Sault Ste. Marie, Ontario, Canada: Canadian National Vegetation Classification. January, 2017; generated Jan/25/2017; cited ENTER DATE ACCESSED. 10 p. Canadian National Vegetation Classification Association: CNVC00339. Available from http://cnvc-cnvc/ca. System Requirements: Adobe Acrobat Reader v. 7.0 or higher. ISSN 1916-3274.