



Wetland / Tourbière boisée

Association CNVC00312

***Picea mariana* – *Abies balsamea* / *Osmundastrum cinnamomeum* – *Carex trisperma* / *Sphagnum* spp.**

**Black Spruce – Balsam Fir / Cinnamon Fern – Three-seeded Sedge / Peat Mosses
 Épinette noire – Sapin baumier / Osmonde cannelle – Carex trisperme / Sphaignes**

Subassociations: 312a *typic*, 312b *Ilex mucronata*

CNVC Alliance: CA00041 *Abies balsamea* – *Picea mariana* / *Osmundastrum cinnamomeum* – *Carex trisperma* / *Sphagnum* spp.

CNVC Group: CG0016 Atlantic Boreal Black Spruce – Balsam Fir Poor – Intermediate Treed Wetland



Source: B. Meades

Type Description

Concept: CNVC00312 is a boreal wetland coniferous forest Association that occurs in insular Newfoundland. It has a moderately closed to closed canopy of black spruce (*Picea mariana*) and balsam fir (*Abies balsamea*). The shrub layer is variable in its development, comprising mostly regenerating black spruce. A dense herb layer dominated by three-seeded sedge (*Carex trisperma*) and cinnamon fern (*Osmundastrum cinnamomeum*) is characteristic of this Association. Bunchberry (*Cornus canadensis*), creeping snowberry (*Gaultheria hispidula*), twinflower (*Linnaea borealis*), yellow clintonia (*Clintonia borealis*) and goldthread (*Coptis trifolia*) are often present in the herb layer. Peat mosses (*Sphagnum* spp.) form a continuous ground cover. CNVC00312 occurs on wet, nutrient-poor to medium sites in a region with a very humid, maritime boreal climate. Substrates are organic soils formed from slowly decomposing sedges and *Sphagnum*. Fire is uncommon; this is typically a stable condition that is maintained by a persistently high water table. Local hydrology and wind are the primary drivers of vegetation dynamics. Two subassociations are distinguished, *typic* and *Ilex mucronata*.

Vegetation: CNVC00312 is a coniferous forest Association with a moderately closed to closed canopy dominated by *Picea mariana* and *Abies balsamea*. *Betula papyrifera* (see Comments) and *Larix laricina* are occasional canopy associates. The shrub layer varies from sparse, in the *typic* subassociation, to well developed, in the *Ilex mucronata* subassociation. In all cases, regenerating *Picea mariana* is the leading species in the shrub layer. In the *Ilex mucronata* subassociation, patches of *I. mucronata* and *Viburnum nudum* (see Comments), often with ericaceous species (especially *Kalmia angustifolia*), are common. The herb layer is dense and characterized by abundant *Carex trisperma* and, usually, *Osmundastrum cinnamomeum*. Numerous other species occur with low to moderate abundance in the herb layer, including *Cornus canadensis*, *Gaultheria hispidula*, *Linnaea borealis*, *Clintonia borealis* and *Coptis trifolia*. *Maianthemum trifolium* is usually present in the *Ilex mucronata* subassociation and *Rubus chamaemorus* in the *typic* subassociation. The moss layer is continuous and dominated by *Sphagnum* species, predominantly *S. russowii* and *S. girgensohnii*. In northern Newfoundland, stands of CNVC00312 lack *Rhododendron canadense*, *I. mucronata* and *V. nudum*.

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



***Picea mariana* – *Abies balsamea* / *Osmundastrum cinnamomeum* – *Carex trisperma* /
Sphagnum spp. CNVC00312**

Type Description (cont'd)

Environment: CNVC00312 is a marginally productive forest, occurring on wet, nutrient-poor to medium sites, in a region with a very humid, maritime boreal climate. Stands occur on peat-accumulating sites at the margins of peatland basins or in areas of transition between closed upland forests and open peatlands. On these sites, the water table is permanently near the surface of the organic layer. Organic material forms from slowly decomposing *Carex* and *Sphagnum* spp. and its depth over mineral or bedrock substrates ranges from approximately 20 cm to > 1 m. Seepage creates minerotrophic conditions in the rooting layer.

Topography controls the spatial extent of stands of CNVC00312. In gently rolling landscapes, the forest to peatland transition is gradual and this Association can be extensive, whereas in hilly terrain the transition is more abrupt and the Association occurs as a narrow ribbon between upland forests and open peatlands. In eastern Newfoundland this type can also occur in topographic depressions where 50-70 cm of peat overlies bedrock.

Dynamics: CNVC00312 is a stable condition that is maintained by a persistently high water table and poor to medium 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 are wet sites in a very humid climate. Consequently, stands of CNVC00312 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. *Abies balsamea* does not reproduce by layering, but can seed into these sites.

CNVC00312 occurs in a windy environment and the shallowly rooted trees are vulnerable to windthrow. However, with abundant conifer regeneration, these stands readily recover from wind disturbance and are effectively perpetuated by windthrow events.

Range: CNVC00312 occurs on insular Newfoundland including the Northern Peninsula, southwestern Newfoundland and the Avalon Peninsula. The *typic* subassociation is described from the Northern Peninsula and southwestern Newfoundland. The *Ilex mucronata* subassociation is described from southwestern Newfoundland and the Avalon Peninsula.

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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Black Spruce – Balsam Fir / Cinnamon Fern – Three-seeded Sedge / Peat Mosses
 Épinette noire – Sapin baumier / Osmonde cannelle – Carex trisperme / Sphaignes

Distribution

Countries: Canada

Provinces / Territories / States: Newfoundland and Labrador

Terrestrial Ecozones and Ecoregions of Canada: Boreal Shield: Avalon Forest, Maritime Barrens, Northern Peninsula, Southwestern Newfoundland, Strait of Belle Isle

Rowe's Forest Regions and Sections of Canada: Boreal: Avalon, Corner Brook, Newfoundland-Labrador Barrens, Northern Peninsula

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

Nature Conservancy of Canada Ecoregions: Boreal Shield

Ecoregions of Newfoundland: Avalon Forest, Maritime Barrens, Northern Peninsula, Southwestern Newfoundland, Strait of Belle Isle



Corresponding Types and Associations

312a typic	Newfoundland and Labrador	N CSP	Northern: <i>Carex</i> - <i>Sphagnum</i> - black spruce forest
		W SP	Western: <i>Sphagnum robustum</i> - black spruce forest (typical variant)
312b Ilex mucronata	Newfoundland and Labrador	E OP	Eastern: <i>Osmunda</i> - black spruce forest
		E SPn	Eastern: <i>Sphagnum</i> - black spruce forest
		W SPn	Western: <i>Sphagnum robustum</i> - black spruce forest (<i>Nemopanthus</i> variant)



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Épinette noire – Sapin baumier / Osmonde cannelle – *Carex trisperme* / Sphaignes

Vegetation Summary*

Species Name [†]	Association CNVC00312		Subassociation 312a <i>typic</i>		Subassociation 312b <i>Ilex mucronata</i>	
	22 plots		7 plots		15 plots	
	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]
Overstory Trees						
<i>Picea mariana</i>	40	100	47	100	37	100
<i>Abies balsamea</i>	22	77	17	71	24	80
<i>Betula papyrifera</i>	6	36	1	29	7	40
<i>Larix laricina</i>	7	32	-	-	7	47
Tree Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(36 46 61 74 86)		(43 53 60 66 71)		(31 46 61 80 94)	
Understory Woody Shrubs and Regenerating Trees						
<i>Picea mariana</i>	20	68	15	57	22	73
<i>Ilex mucronata</i>	11	64	1	14	12	87
<i>Kalmia angustifolia</i>	6	64	1	29	7	80
<i>Viburnum nudum</i>	6	64	3	29	6	80
<i>Vaccinium angustifolium</i>	2	55	1	71	2	47
<i>Abies balsamea</i>	9	45	4	57	12	40
<i>Rhododendron groenlandicum</i>	3	41	1	29	4	47
<i>Amelanchier bartramiana</i>	2	41	2	71	3	27
<i>Rhododendron canadense</i>	10	32	2	43	16	27
<i>Taxus canadensis</i>	2	27	3	14	2	33
<i>Alnus viridis</i>	8	23	4	14	9	27
<i>Rosa nitida</i>	3	18	-	-	3	27
<i>Vaccinium ovalifolium</i>	2	9	2	29	-	-
<i>Betula cordifolia</i>	1	9	1	29	-	-
<i>Sorbus americana</i>	1	9	1	29	-	-
Shrub Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(9 19 44 69 100)		(7 10 19 28 32)		(18 32 56 84 100)	
Understory Herbs and Dwarf Shrubs						
<i>Carex trisperma</i>	19	100	19	100	19	100
<i>Cornus canadensis</i>	6	100	9	100	4	100
<i>Osmundastrum cinnamomeum</i>	24	82	39	57	20	93
<i>Gaultheria hispidula</i>	3	82	4	86	2	80
<i>Linnaea borealis</i>	2	68	2	71	1	67
<i>Clintonia borealis</i>	11	64	13	100	8	47
<i>Coptis trifolia</i>	5	64	7	86	3	53
<i>Maianthemum trifolium</i>	8	59	2	43	9	67
<i>Rubus chamaemorus</i>	5	50	6	71	4	40
<i>Maianthemum canadense</i>	3	45	5	57	2	40
<i>Lysimachia borealis</i>	2	36	1	14	2	47
<i>Rubus pubescens</i>	3	23	-	-	3	33



***Picea mariana* – *Abies balsamea* / *Osmundastrum cinnamomeum* – *Carex trisperma* /
Sphagnum spp. CNVC00312**

Vegetation Summary (cont'd)*

Species Name†	Association CNVC00312		Subassociation 312a <i>typic</i>		Subassociation 312b <i>Ilex mucronata</i>	
	% Cover‡	% Presence^	% Cover‡	% Presence^	% Cover‡	% Presence^
<i>Vaccinium oxycoccos</i>	3	23	-	-	3	33
<i>Calamagrostis canadensis</i>	9	18	-	-	9	27
<i>Epigaea repens</i>	3	18	3	43	1	7
<i>Eurybia radula</i>	2	18	-	-	2	27
Herb Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(36 45 72 100 100)		(42 56 74 100 100)		(38 44 70 100 100)	
Bryophytes and Lichens						
<i>Sphagnum russowii</i>	22	77	39	86	13	73
<i>Sphagnum girgensohnii</i>	38	59	34	71	40	53
<i>Pleurozium schreberi</i>	8	59	11	71	6	53
<i>Hylocomium splendens</i>	8	41	9	43	8	40
<i>Sphagnum recurvum</i>	30	36	4	57	56	27
<i>Sphagnum magellanicum</i>	16	36	5	43	22	33
<i>Dicranum majus</i>	5	36	4	57	7	27
<i>Bazzania trilobata</i>	3	36	2	57	4	27
<i>Sphagnum quinquefarium</i>	17	32	-	-	17	47
<i>Sphagnum papillosum</i>	16	32	-	-	16	47
<i>Ptilium crista-castrensis</i>	4	27	5	43	2	20
<i>Rhytidiadelphus triquetrus</i>	4	23	-	-	4	33
<i>Rhytidiadelphus loreus</i>	2	23	1	14	2	27
<i>Sphagnum angustifolium</i>	32	18	-	-	32	27
<i>Sphagnum capillifolium</i>	17	18	17	57	-	-
<i>Hylocomiastrum umbratum</i>	5	9	5	29	-	-
<i>Sphagnum fuscum</i>	1	5	1	14	-	-
Bryo-Lichen Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(75 94 93 100 100)		(62 88 87 100 100)		(80 94 95 100 100)	

* 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 CNVC00312 22 plots	Subassociation 312a <i>typic</i> 7 plots	Subassociation 312b <i>Ilex mucronata</i> 15 plots
Elevation Range (min–mean–max meters)	30–180–335	30–232–335	85–155–217
Slope Gradient (% frequency)	moderate (5) gentle (9) level (59) missing data (27)	moderate (0) gentle (0) level (71) missing data (29)	moderate (7) gentle (13) level (53) missing data (27)
Aspect (% frequency)	north (14) south (18) west (18) level (23) missing data (27)	north (0) south (0) west (29) level (43) missing data (29)	north (20) south (27) west (13) level (13) missing data (27)
Meso Toposition (% frequency)	mid (5) lower / toe (23) depression (9) level (9) missing data (55)	mid (0) lower / toe (0) depression (0) level (0) missing data (100)	mid (7) lower / toe (33) depression (13) level (13) missing data (33)
Moisture Regime (% frequency)	wet (100)	wet (100)	wet (100)
Nutrient Regime (% frequency)	missing data (100)	missing data (100)	missing data (100)
Soil Parent Material (% frequency)	moraine / till (36) glaciofluvial (5) organic (36) missing data (23)	moraine / till (57) glaciofluvial (0) organic (0) missing data (43)	moraine / till (27) glaciofluvial (7) organic (53) missing data (13)
Soil Rooting Zone Substrate (% frequency)	coarse loamy (5) organic (36) missing data (59)	coarse loamy (14) organic (0) missing data (86)	coarse loamy (0) organic (53) missing data (47)
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)



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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:

CNVC00293 [*Picea mariana* / *Sanguisorba canadensis* / *Rhytidiadelphus triquetrus*] occurs on richer sites in the same range. It is dominated by *Picea mariana* and has more abundant *Carex vaginata* and often *C. leptalea*, rather than *C. trisperma*, in the understory, and greater cover of more nutrient-demanding herbs, such as *Sanguisorba canadensis*, *Mitella nuda*, *Geum rivale* and *Rubus pubescens*. It has less abundant *Sphagnum* mosses and more abundant brown mosses and feathermosses, including *Rhytidiadelphus triquetrus* and *Hylocomium splendens*.

CNVC00303 [*Picea mariana* / *Carex* spp. / *Rhytidiadelphus triquetrus*] occurs on wet, nutrient-rich sites on the Magdalen Islands and Anticosti Island. It has less *Abies balsamea* in the tree layer and often has *Larix laricina* as a codominant. In the herb layer, it has more abundant *Carex* spp. as well as greater cover of more nutrient-demanding herbs, such as *Mitella nuda*, *Rubus pubescens* and *Viola* spp., and much less *Sphagnum* moss cover.

CNVC00334 [*Abies balsamea* / *Osmundastrum cinnamomeum* – *Carex trisperma* / *Sphagnum* spp.] occurs on moist to wet, nutrient-medium to rich sites in the same range. It is floristically similar to CNVC00312, but is *Abies balsamea*-dominated and has more *A. balsamea* in the understory as well as more abundant *Dryopteris spinulosa*.

CNVC00335 [*Picea mariana* / *Kalmia angustifolia* / *Pleurozium schreberi* – *Sphagnum capillifolium*] occurs on poorer sites in the same range. It has less *Abies balsamea* in the tree layer, a shrub layer with more abundant *Kalmia angustifolia* and *Vaccinium angustifolium*, and little to no *Osmundastrum cinnamomeum* or *Carex trisperma* in the herb layer.

CNVC00339 [*Picea mariana* – *Kalmia angustifolia* – *Ilex mucronata* / *Sphagnum* spp. – *Gladina* spp. – *Pleurozium schreberi*] occurs on poorer sites in the same range but is characterized by a krummholtz physiognomy. It is dominated by *Picea mariana* and has abundant ericaceous shrub species, without the abundant *Osmundastrum cinnamomeum* and *Carex trisperma* that characterize CNVC00312.

CNVC00353 [*Picea mariana* / *Alnus incana* / *Carex vaginata* / *Rhytidiadelphus triquetrus*] occurs on richer sites in central Newfoundland. It has much less *Abies balsamea* in the tree layer and abundant *Alnus incana*, and often *Carex vaginata*, in the understory.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

CNVC00312 includes the concept of Ss#12 [*Sphagnum* – Black spruce] and elements of SO#19 [*Osmunda* – Black spruce] in Meades & Moores 1994.

Comments

CNVC00312 is consistent with the concept of a coniferous treed swamp in the Canadian Wetland Classification System.

Betula papyrifera here refers to both *B. papyrifera* (paper birch) and *B. cordifolia* (heart-leaved birch).

Viburnum nudum here refers to var. *cassinoides*.



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Source Information

Number of source plots for CNVC00312: 22

Number of source plots for 312a typic: 7

Number of source plots for 312b *Ilex mucronata*: 15

Information Sources:

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, K. Chapman, B. Meades

Description Authors: B. Meades, K. Chapman and K. Baldwin

Date of Concept: February, 2014

Date of Description: March, 2018

Classification References:

Damman, A.W.H. 1963. A reconnaissance survey of the ecological conditions in the forests of the Roddickton Area, Newfoundland. For. Res. Branch, Can. Dept. For., NL. Mimeo 63-N-1.

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Sphagnum spp. CNVC00312**

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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