



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

<http://cnvc-cnvc.ca>

Forest / Forêt

Association CNVC00232

Abies balsamea* – *Betula papyrifera* / *Pleurozium schreberi
Balsam Fir – Paper Birch / Red-stemmed Feathermoss
Sapin baumier – Bouleau à papier / Pleurozie dorée

Subassociations: 232a *typic*, 232b *Hylocomium splendens*

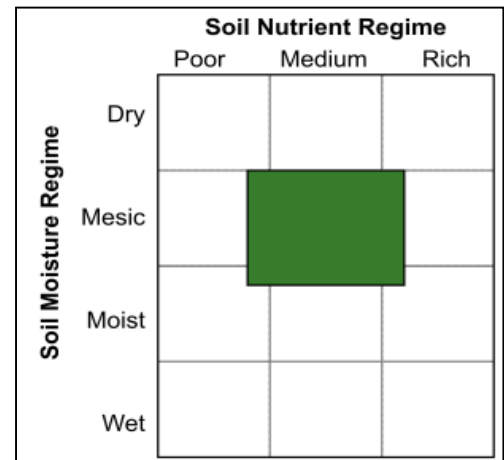
CNVC Alliance: CA00005 *Abies balsamea* (*Betula papyrifera*) / *Pleurozium schreberi*

CNVC Group: CG0003 Atlantic Boreal Mesic Balsam Fir – Paper Birch – White Spruce Forest

Type Description

Concept: CNVC00232 is a boreal mixedwood forest Association that occurs in Quebec. It has a moderately closed to closed canopy dominated by balsam fir (*Abies balsamea*) and paper birch (*Betula papyrifera*), often with a minor component of black spruce (*Picea mariana*). Regeneration of these tree species, particularly balsam fir, also dominates the well-developed shrub layer. Serviceberries (*Amelanchier* spp.), velvet-leaved blueberry (*Vaccinium myrtilloides*) and early lowbush blueberry (*V. angustifolium*) are often present. The herb layer is poorly to moderately developed, depending on subassociation, but usually includes bunchberry (*Cornus canadensis*), yellow clintonia (*Clintonia borealis*), creeping snowberry (*Gaultheria hispida*), wild lily-of-the-valley (*Maianthemum canadense*), twinflower (*Linnaea borealis*), northern starflower (*Lysimachia borealis*) and goldthread (*Coptis trifolia*). A well-developed to continuous moss layer comprising red-stemmed feathermoss (*Pleurozium schreberi*), broom mosses (*Dicranum* spp.), knight's plume moss (*Ptilium crista-castrensis*) and stairstep moss (*Hylocomium splendens*) further characterizes this Association. CNVC00232 occurs in a region with a boreal climate that grades from humid continental in the western portion of its range to very humid and maritime in the east. It is most commonly found on mesic, nutrient-medium sites. It is a mid-seral condition that is usually maintained on the landscape by small-scale gap or patch disturbances, such as insect outbreaks and windthrow, in the absence of fire or harvesting. Two subassociations are distinguished, *typic* and *Hylocomium splendens*.

Vegetation: CNVC00232 is a mixedwood forest Association with a moderately closed to closed canopy that is dominated by *Abies balsamea* and *Betula papyrifera*. Minor amounts of *Picea mariana*, sometimes with *P. glauca*, are usually present in the tree layer. Regeneration of these tree species, especially *A. balsamea*, dominates the well-developed shrub layer. *Amelanchier* spp., *Vaccinium myrtilloides* and *V. angustifolium* commonly occur at low abundance. The herb layer is moderately developed in the *typic* subassociation but poorly developed in the *Hylocomium splendens* subassociation. *Cornus canadensis*, *Clintonia borealis*, *Gaultheria hispida*, *Maianthemum canadense*, *Linnaea borealis*, *Lysimachia borealis* and *Coptis trifolia* are common species. The moss layer is well developed to continuous; it is usually better developed in stands with less broad-leaf litter (i.e., greater conifer cover). *Pleurozium schreberi* is usually the dominant moss, as in the *typic* subassociation, but *Hylocomium splendens* can be dominant, and distinguishes the second subassociation. Several other mosses and lichens are often present, including *Dicranum* spp., *Ptilium crista-castrensis*, *Cladina rangiferina*, *Hylocomium splendens*, *Polytrichum* spp. and *Cladonia* spp.





***Abies balsamea* – *Betula papyrifera* / *Pleurozium schreberi* CNVC00232**

Type Description (cont'd)

Environment: CNVC00232 occurs in a boreal climate that grades from humid and continental in the western portion of its range to very humid and maritime in the east. It is commonly found on mesic, nutrient-medium sites. Stands are usually on gentle to moderately steep slopes, typically on middle-slope topopositions. Stands tend to be more common on cooler aspects, either east or north-facing. Soils are usually moderately deep to deep, coarse-textured and well drained, and derived from morainal parent materials. Mor humus forms are typical.

Compared to the *typic* subassociation, the *Hylocomium splendens* subassociation is more frequently found on steeper slopes and on middle-slope topopositions. It is more common on east aspects than is the *typic*. Since the *Hylocomium splendens* subassociation may describe stands that have experienced greater time since fire (see Dynamics), these topopositions and aspects may be more protected from fire.

CNVC00232 occurs where regional fire cycles are intermediate (100-270 years) or long (270-500 years). Where the regional fire cycle is intermediate, stands likely occur on sites that have escaped fire.

Dynamics: CNVC00232 is a mid-seral condition that can be self-replacing. It occurs where fires are typically infrequent. Natural disturbance processes are primarily insect outbreaks, windthrow, or natural mortality of individual or small groups of trees by disease and other factors. These small-scale gap or patch disturbances result in canopy openings that can release *Abies balsamea* regeneration in the understory and provide opportunities for *Betula papyrifera* to regenerate from seeds or stump sprouts, thus maintaining the mixedwood condition.

Extensive outbreaks of spruce budworm (*Choristoneura fumiferana*) and hemlock looper (*Lambdina fiscellaria fiscellaria*) occur periodically across the range of this Association, causing widespread canopy mortality of *A. balsamea*. Small-scale disturbances typically result in an uneven-age structure within stands, but severe large-scale disturbances can release a cohort of trees that are more or less the same age. Severe insect epidemics can enhance the proportions of *B. papyrifera*, *Picea glauca* and *P. mariana* in the canopy since these species are less vulnerable to spruce budworm and hemlock looper, but ultimately the highly shade tolerant *A. balsamea* re-establishes canopy dominance from abundant regeneration in the understory. Without further disturbance to meet the high light requirements of *B. papyrifera*, CNVC00222 [*Abies balsamea* / *Pleurozium schreberi*] can gradually form. Usually stands of CNVC00222 and CNVC00232 co-exist spatially in the landscape mosaic.

Occasionally CNVC00232 can succeed early seral *B. papyrifera* stands or establish after fire or harvesting. *B. papyrifera* is a pioneer species that is adapted to disturbance. Following any disturbance that does not kill its roots, it can reproduce vegetatively from stump sprouts. Its wind-dispersed seeds also readily colonize mineral soil seedbeds exposed by disturbance. If *A. balsamea* seeds are available from nearby areas, it can also establish immediately following these disturbances. Otherwise, *A. balsamea* often becomes established in early seral *B. papyrifera* stands and grows into the canopy over time.

Range: CNVC00232 occurs in the boreal region of Quebec. It extends from east of Lake Abitibi to the Lower North Shore of the Gulf of Saint Lawrence near the Little Mecatina River. It also occurs in the Gaspé region and on Anticosti Island.

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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 Sapin baumier – Bouleau à papier / Pleurozie dorée

Distribution

Countries: Canada

Provinces / Territories / States: Quebec

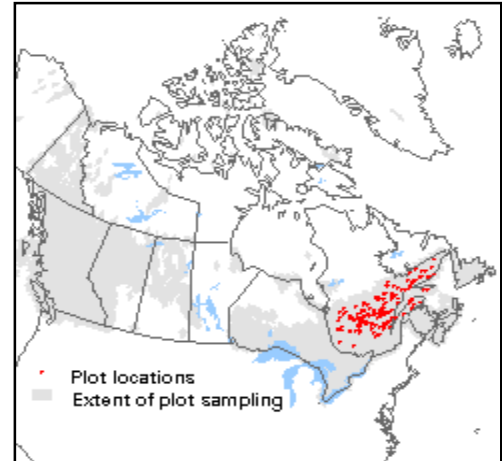
Terrestrial Ecozones and Ecoregions of Canada: Atlantic Highlands: Appalachians; Boreal Shield: Abitibi Plains, Anticosti Island, Central Laurentians, Lake Timiskaming Lowland, Mecatina Plateau, Rivière Rupert Plateau, Southern Laurentians

Rowe's Forest Regions and Sections of Canada: Boreal: Anticosti, Chibougamau-Natashquan, Gaspé, Gouin, Laurentide-Onatchiway, Missinaibi-Cabonga, Newfoundland-Labrador Barrens, Northern Clay; Great Lakes-St. Lawrence: Algonquin-Pontiac, Laurentian, 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, Northern Appalachians-Acadia

Bioclimatic Domains and Subdomains of Québec: 3 Est, 4 Est, 4 Ouest, 5 Est, 5 Ouest, 6 Est, 6 Ouest, 7



Corresponding Types and Associations

232a typic	Quebec	QC070A	<i>Abies balsamea - Betula papyrifera / Pleurozium schreberi</i> [Typique]
232b <i>Hylocomium splendens</i>	Quebec	QC070C	<i>Abies balsamea - Betula papyrifera / Pleurozium schreberi</i> [<i>Hylocomium splendens</i>]



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Balsam Fir – Paper Birch / Red-stemmed Feathermoss

Sapin baumier – Bouleau à papier / Pleurozie dorée

Vegetation Summary*

Species Name [†]	Association CNVC00232		Subassociation 232a <i>typic</i>		Subassociation 232b <i>Hylocomium splendens</i>	
	164 plots		148 plots		16 plots	
	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]
Overstory Trees						
<i>Betula papyrifera</i>	25	100	26	100	18	100
<i>Abies balsamea</i>	24	100	25	100	22	100
<i>Picea mariana</i>	9	80	9	82	10	56
<i>Picea glauca</i>	8	45	8	43	6	56
Tree Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(36 49 62 83 86)		(36 49 64 83 86)		(32 49 48 50 53)	
Understory Woody Shrubs and Regenerating Trees						
<i>Abies balsamea</i>	26	100	24	100	42	100
<i>Betula papyrifera</i>	6	91	6	90	6	100
<i>Picea mariana</i>	8	84	8	84	8	81
<i>Amelanchier</i> sp.	5	67	5	70	4	44
<i>Vaccinium myrtilloides</i>	4	62	4	66	5	25
<i>Vaccinium angustifolium</i>	3	55	3	57	2	38
<i>Sorbus americana</i>	4	54	4	55	3	44
<i>Picea glauca</i>	5	40	4	39	14	50
<i>Kalmia angustifolia</i>	4	36	4	38	3	19
<i>Sorbus decora</i>	3	29	3	30	4	25
<i>Acer spicatum</i>	5	26	4	25	6	31
<i>Rhododendron groenlandicum</i>	4	23	4	25	2	6
<i>Ribes glandulosum</i>	3	21	3	23	3	6
<i>Salix</i> sp.	3	21	3	22	2	13
<i>Viburnum edule</i>	3	21	3	21	2	19
<i>Rubus idaeus</i>	3	16	3	14	3	38
Shrub Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(19 32 52 66 86)		(19 32 51 66 86)		(12 45 62 84 99)	
Understory Herbs and Dwarf Shrubs						
<i>Cornus canadensis</i>	10	95	10	95	5	88
<i>Clintonia borealis</i>	4	84	4	85	3	75
<i>Gaultheria hispidula</i>	3	81	3	80	4	88
<i>Maianthemum canadense</i>	5	79	5	79	4	81
<i>Linnaea borealis</i>	3	73	3	76	2	44
<i>Lysimachia borealis</i>	2	71	2	73	2	56
<i>Coptis trifolia</i>	3	66	3	66	3	69
<i>Dryopteris spinulosa</i> complex	2	54	2	56	2	38
<i>Lycopodium annotinum</i>	3	46	3	49	9	13
<i>Aralia nudicaulis</i>	4	44	4	45	3	38
<i>Lycopodium obscurum</i>	2	38	2	42	2	6
<i>Oxalis montana</i>	3	37	3	35	3	50



***Abies balsamea* – *Betula papyrifera* / *Pleurozium schreberi* CNVC00232**

Vegetation Summary (cont'd)*

Species Name†	Association CNVC00232		Subassociation 232a <i>typic</i>		Subassociation 232b <i>Hylocomium splendens</i>	
	% Cover‡	% Presence^	% Cover‡	% Presence^	% Cover‡	% Presence^
<i>Solidago macrophylla</i>	3	32	3	33	2	19
<i>Gymnocarpium dryopteris</i>	3	27	3	26	2	44
<i>Streptopus lanceolatus</i>	2	16	2	16	2	25
Herb Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(3 16 23 33 50)		(3 16 24 33 50)		(3 3 13 16 33)	
Bryophytes and Lichens						
<i>Pleurozium schreberi</i>	45	100	48	100	24	100
<i>Dicranum</i> sp.	4	98	4	98	3	94
<i>Ptilium crista-castrensis</i>	6	82	6	81	6	88
<i>Cladina rangiferina</i>	2	68	2	70	2	44
<i>Hylocomium splendens</i>	13	67	7	64	49	100
<i>Polytrichum</i> sp.	3	67	3	66	2	81
<i>Cladonia</i> sp.	2	63	2	61	2	75
<i>Sphagnum</i> sp.	5	48	5	46	9	63
<i>Bazzania trilobata</i>	2	30	2	30	2	38
<i>Cladina mitis</i>	2	30	2	31	3	25
<i>Sphagnum girgensohnii</i>	3	13	3	11	3	25
Bryo-Lichen Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(33 50 65 90 90)		(33 50 63 90 90)		(70 70 82 90 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 = Xth percentile (e.g., P₁₀ = 10th percentile)



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Balsam Fir – Paper Birch / Red-stemmed Feathermoss

Sapin baumier – Bouleau à papier / Pleurozie dorée

Site / Soil Characteristics

	Association CNVC00232 164 plots	Subassociation 232a <i>typic</i> 148 plots	Subassociation 232b <i>Hylocomium splendens</i> 16 plots
Elevation Range (min–mean–max meters)	40–454–895	40–462–895	60–382–730
Slope Gradient (% frequency)	very steep (1) steep (12) moderately steep (29) moderate (31) gentle (18) level (9)	very steep (1) steep (11) moderately steep (28) moderate (32) gentle (18) level (10)	very steep (6) steep (19) moderately steep (38) moderate (19) gentle (19) level (0)
Aspect (% frequency)	north (26) east (32) south (16) west (16) level (11)	north (26) east (30) south (16) west (17) level (12)	north (25) east (50) south (19) west (6) level (0)
Meso Toposition (% frequency)	crest / upper (16) mid (69) lower / toe (5) depression (3) level (6)	crest / upper (18) mid (66) lower / toe (6) depression (3) level (7)	crest / upper (6) mid (94) lower / toe (0) depression (0) level (0)
Moisture Regime (% frequency)	dry (2) mesic (85) moist (12) wet (1)	dry (1) mesic (86) moist (12) wet (1)	dry (6) mesic (81) moist (13) wet (0)
Nutrient Regime (% frequency)	missing data (100)	missing data (100)	missing data (100)



***Abies balsamea* – *Betula papyrifera* / *Pleurozium schreberi* CNVC00232**

Site / Soil Characteristics (cont'd)

	Association CNVC00232	Subassociation 232a <i>typic</i>	Subassociation 232b <i>Hylocomium splendens</i>
Soil Parent Material (% frequency)	bedrock (1) colluvium (4) moraine / till (86) glaciofluvial (4) glaciolacustrine (3) marine (2)	bedrock (1) colluvium (3) moraine / till (86) glaciofluvial (4) glaciolacustrine (3) marine (2)	bedrock (0) colluvium (6) moraine / till (88) glaciofluvial (6) glaciolacustrine (0) marine (0)
Soil Rooting Zone Substrate (% frequency)	non-soil (5) sandy (6) coarse loamy (21) fine loamy (4) silty (1) organic (1) missing data (63)	non-soil (5) sandy (7) coarse loamy (20) fine loamy (3) silty (1) organic (1) missing data (64)	non-soil (6) sandy (0) coarse loamy (31) fine loamy (6) silty (0) organic (0) missing data (56)
Root Restricting Depth (% frequency)	0 – 20 cm (6) 21 – 99 cm (59) missing data (35)	0 – 20 cm (7) 21 – 99 cm (59) missing data (34)	0 – 20 cm (0) 21 – 99 cm (63) missing data (38)
Humus Form (% frequency)	mor (98) moder (2)	mor (97) moder (3)	mor (100) moder (0)



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Balsam Fir – Paper Birch / Red-stemmed Feathermoss

Sapin baumier – Bouleau à papier / Pleurozie dorée

Additional Characteristics

Species of High Conservation Concern:

Non-native Species:

Management Issues:

Type Statistics

Internal Similarity:

Confidence:

Strength:

Related Concepts

Similar CNVC Associations:

CNVC00231 [*Abies balsamea* – *Betula papyrifera* – *Populus tremuloides* / *Clintonia borealis*] occurs on similar sites in the same range but has more *Populus tremuloides* and a less developed moss layer.

CNVC00233 [*Abies balsamea* – *Betula papyrifera* / *Oxalis montana* / *Pleurozium schreberi*] occurs on comparable sites in New Brunswick, Nova Scotia and Quebec, often at higher elevations. It has more *Sorbus americana* in the shrub layer and more *Oxalis montana* and *Dryopteris* spp. in the herb layer.

CNVC00234 [*Picea mariana* – *Betula papyrifera* – *Abies balsamea* / *Clintonia borealis*] occurs on similar sites in the same range but has *Picea mariana* codominant in the canopy.

CNVC00235 [*Abies balsamea* – *Betula papyrifera* / *Acer spicatum*] occurs on slightly richer sites in the same range and has abundant *Acer spicatum* and *Corylus cornuta* in the shrub layer.

CNVC00270 [*Betula papyrifera* – *Picea mariana* – *Abies balsamea* / *Pleurozium schreberi* – *Sphagnum* spp.] occurs on moister sites in the same range and has more *Picea mariana* and *Sphagnum* mosses.

CNVC00274 [*Betula papyrifera* – *Abies balsamea* / *Alnus incana*] occurs on moister, richer sites in the same range and has abundant *Alnus incana* in the shrub layer.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

Comments



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***Abies balsamea* – *Betula papyrifera* / *Pleurozium schreberi* CNVC00232**

Source Information

Number of source plots for CNVC00232: 164

Number of source plots for 232a typic: 148

Number of source plots for 232b *Hylocomium splendens*: 16

Information Sources:

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, C. Morneau

Description Authors: K. Chapman, K. Baldwin and J.-P. Saucier

Date of Concept: May, 2010

Date of Description: February, 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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Characterization References:

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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.

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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.

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***Abies balsamea* – *Betula papyrifera* / *Pleurozium schreberi* CNVC00232**

Characterization References (cont'd):

McCarthy, J. 2001. Gap dynamics of forest trees: a review with particular attention to boreal forests. *Environ. Rev.* 9(1):1-59.

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Uchytil, R.J. 1991. *Betula papyrifera*. 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/betpap/all.html> (accessed: May 27, 2015).

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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