



Forest / Forêt

Association CNVC00274

***Betula papyrifera* – *Abies balsamea* / *Alnus incana***  
**Paper Birch – Balsam Fir / Speckled Alder**  
**Bouleau à papier – Sapin baumier / Aulne rugueux**

**Subassociations:** 274a *typic*, 274b *Rubus pubescens*

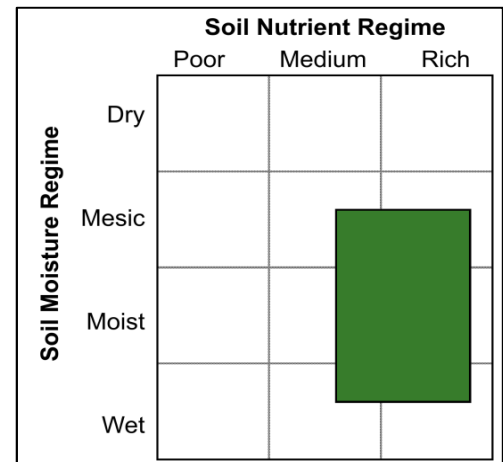
**CNVC Alliance:** CA00018 *Betula papyrifera* – *Abies balsamea* / *Alnus incana*

**CNVC Group:** CG0008 Ontario-Quebec Boreal Moist Black Spruce – Trembling Aspen – Balsam Fir – Paper Birch Forest

### Type Description

**Concept:** CNVC00274 is a boreal mixedwood forest Association that occurs in Quebec. It has a closed canopy of paper birch (*Betula papyrifera*) with balsam fir (*Abies balsamea*) and/or white spruce (*Picea glauca*). The dense shrub layer is dominated by speckled alder (*Alnus incana*), although balsam fir regeneration and mountain maple (*Acer spicatum*) are often abundant. Red raspberry (*Rubus idaeus*), paper birch saplings and American mountain-ash (*Sorbus americana*) are also common in the shrub layer. The herb layer is well developed and typically includes low cover of many species, such as wood ferns (*Dryopteris* spp.), northern starflower (*Lysimachia borealis*), dwarf raspberry (*R. pubescens*), yellow clintonia (*Clintonia borealis*), bunchberry (*Cornus canadensis*), wild lily-of-the-valley (*Maianthemum canadense*), violets (*Viola* spp.), goldthread (*Coptis trifolia*), sedges (*Carex* spp.) and oak fern (*Gymnocarpium dryopteris*). The forest floor cover is mainly broad-leaf litter, so the moss layer is sparse, with only minor cover of red-stemmed feathermoss (*Pleurozium schreberi*). CNVC00274 occurs in a region with a humid continental boreal climate, usually on moist, nutrient-rich sites that are some of the most productive sites in the region. It is a mid-seral condition that can develop as shade-tolerant balsam fir and white spruce become established in early seral paper birch / speckled alder stands. Partial disturbances, such as insect outbreaks and windthrow, can maintain this mixedwood condition on the landscape. There are two subassociations, *typic* and *Rubus pubescens*.

**Vegetation:** CNVC00274 is a mixedwood forest Association with a closed canopy that is dominated by *Betula papyrifera* and *Abies balsamea* and/or *Picea glauca*. *Alnus incana* (see Comments) is dominant in the dense tall shrub layer, although *A. balsamea* regeneration and *Acer spicatum* can be abundant. Less abundant species in this layer commonly include *Rubus idaeus*, *B. papyrifera* and *Sorbus americana*. The herb layer is well developed and usually includes low cover of many species, such as *Dryopteris* spp., *Lysimachia borealis*, *Rubus pubescens*, *Clintonia borealis*, *Cornus canadensis*, *Maianthemum canadense*, *Viola* spp., *Coptis trifolia*, *Carex* spp. and *Gymnocarpium dryopteris*. Forest floor cover is predominantly broad-leaf litter, so the moss layer is poorly developed, with only *Pleurozium schreberi* and *Dicranum* spp. common, mainly on fallen logs and at the base of trees. Compared to the *typic*, the *Rubus pubescens* subassociation has greater frequency of nutrient-demanding species such as *Ribes triste*, *Rubus pubescens*, *Athyrium filix-femina* and *Mitella nuda*.





***Betula papyrifera* – *Abies balsamea* / *Alnus incana* CNVC00274**

**Type Description (cont'd)**

**Environment:** CNVC00274 occurs primarily in a humid continental boreal climate. It is mainly found on mesic to moist or sometimes wet, nutrient-rich sites; these are some of the most productive sites in this region of the boreal. Stands usually occur on gentle morainal slopes on water-receiving, middle to lower or toe-slope topopositions. They also occur on the more level terrain of glaciolacustrine deposits, especially on the Clay Belt in western Quebec. Soils are usually moderately deep to deep. On morainal deposits, sites typically have well-drained, coarse loamy soils that are moisture and nutrient enriched by seepage. On glaciolacustrine deposits, soils are usually fine textured with imperfect drainage. Both site conditions support *Alnus incana*, a shrub that fixes nitrogen, further enriching the soil nutrient status. Humus forms are usually mors but, compared to other boreal Associations, moders and mulls develop more commonly in these stands, and peatmors sometimes develop on wetter sites. Compared to the *typic*, the *Rubus pubescens* subassociation is on slightly richer, wetter sites with a higher likelihood of peatmors or mull humus forms.

Within the range of CNVC00274 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.

**Dynamics:** CNVC00274 is a mid-seral condition that typically succeeds an earlier seral Association such as CNVC00242 [*Betula papyrifera* / *Alnus incana*] as the shade intolerant *Betula papyrifera* is gradually replaced by more shade tolerant conifers, especially *Abies balsamea* and *Picea glauca* (sometimes *P. mariana*). Without further disturbance, the highly shade tolerant *A. balsamea* usually becomes dominant and stands of CNVC00274 could succeed to a late seral condition such as CNVC00297 [*Abies balsamea* / *Alnus incana*].

Partial disturbances, such as outbreaks of spruce budworm (*Choristoneura fumiferana*) or windthrow events, help to maintain CNVC00274 on the landscape. Canopy openings that result from these disturbances can release *A. balsamea* (or *Picea* spp.) regeneration in the understory or, conversely, provide opportunities for *B. papyrifera* to regenerate from seeds or sprouts, maintaining the mixedwood condition.

*Alnus incana* and *Acer spicatum* can form dense thickets in canopy openings, *A. incana* 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 these shrub species can survive even high-severity fires and they respond quickly after disturbance by sprouting. Being semi-shade tolerant, these tall shrubs persist as the canopy closes, limiting available light for plants beneath them.

**Range:** CNVC00274 occurs in the boreal region of Quebec. It ranges from the Ontario border to the Upper North Shore of the Saint Lawrence River near Baie-Comeau and also occurs in the Gaspé region. CNVC00274 occurs sporadically in the northern temperate region, usually on sites that are cooler than normal for that region (e.g., at higher elevations or on north aspects).

**Conservation Status (NatureServe)**

**Global Conservation Rank:** no applicable rank

**National Conservation Rank:** not yet determined

**Subnational Conservation Rank:** not yet determined



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

<http://cnvc-cnvc.ca>

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## Distribution

**Countries:** Canada

**Provinces / Territories / States:** Quebec

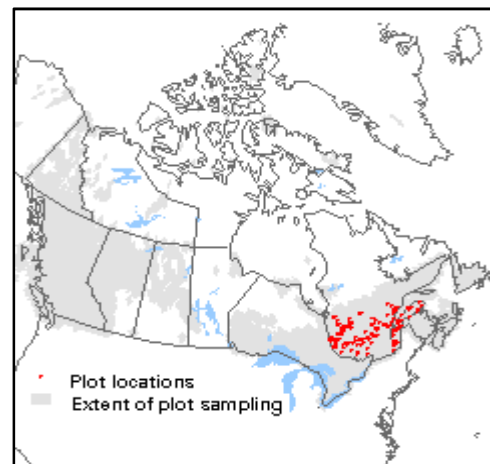
**Terrestrial Ecozones and Ecoregions of Canada:** Atlantic Highlands: Appalachians, Northern New Brunswick Uplands; Boreal Shield: Abitibi Plains, Central Laurentians, Lake Timiskaming Lowland, Rivière Rupert Plateau, Southern Laurentians

**Rowe's Forest Regions and Sections of Canada:** Boreal: Chibougamau-Natashquan, Gaspé, Gouin, Laurentide-Onatchiway, Missinaibi-Cabonga, Northern Clay; Great Lakes-St. Lawrence: Algonquin-Pontiac, Eastern Townships, Haileybury Clay, Laurentian, Middle Ottawa, 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, 3 Ouest, 4 Est, 4 Ouest, 5 Est, 5 Ouest, 6 Est, 6 Ouest



## Corresponding Types and Associations

<b>274a typic</b>	Quebec	QC065	<i>Picea mariana</i> - <i>Betula papyrifera</i> ( <i>Abies balsamea</i> ) / <i>Alnus incana</i>
		QC072A	<i>Abies balsamea</i> - <i>Betula papyrifera</i> / <i>Alnus incana</i> [Typique]
		QC072B	<i>Abies balsamea</i> - <i>Betula papyrifera</i> / <i>Alnus incana</i> [ <i>Acer spicatum</i> ]
		QC079A	<i>Picea glauca</i> - <i>Betula papyrifera</i> / <i>Alnus incana</i> ( <i>Acer spicatum</i> ) [Typique]
<b>274b <i>Rubus pubescens</i></b>	Quebec	QC072C	<i>Abies balsamea</i> - <i>Betula papyrifera</i> / <i>Alnus incana</i> [ <i>Rubus pubescens</i> ]
		QC079B	<i>Picea glauca</i> - <i>Betula papyrifera</i> / <i>Alnus incana</i> ( <i>Acer spicatum</i> ) [ <i>Rubus pubescens</i> ]



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Vegetation Summary\*

Species Name <sup>†</sup>	Association CNVC00274 119 plots		Subassociation 274a <i>typic</i> 87 plots		Subassociation 274b <i>Rubus pubescens</i> 32 plots	
	% Cover <sup>±</sup>	% Presence <sup>^</sup>	% Cover <sup>±</sup>	% Presence <sup>^</sup>	% Cover <sup>±</sup>	% Presence <sup>^</sup>
<b>Overstory Trees</b>						
<i>Betula papyrifera</i>	20	93	20	97	20	84
<i>Abies balsamea</i>	18	91	19	91	16	91
<i>Picea glauca</i>	16	59	13	54	22	72
<i>Picea mariana</i>	13	41	13	49	12	19
<i>Populus tremuloides</i>	11	27	11	25	12	31
<i>Prunus pensylvanica</i>	9	19	9	23	3	9
<b>Tree Stratum Cover (P<sub>10</sub> P<sub>25</sub> Mean P<sub>75</sub> P<sub>90</sub>)<sup>‡</sup></b>	<b>(46 49 65 83 99)</b>		<b>(49 49 65 83 86)</b>		<b>(35 49 67 83 99)</b>	
<b>Understory Woody Shrubs and Regenerating Trees</b>						
<i>Alnus incana</i>	35	97	35	99	35	91
<i>Abies balsamea</i>	13	97	14	95	10	100
<i>Rubus idaeus</i>	7	73	7	70	7	81
<i>Acer spicatum</i>	21	68	20	67	21	72
<i>Betula papyrifera</i>	5	66	5	66	5	69
<i>Sorbus americana</i>	4	63	4	67	3	53
<i>Ribes glandulosum</i>	4	57	4	59	4	53
<i>Amelanchier sp.</i>	4	47	4	52	5	34
<i>Picea glauca</i>	5	44	5	40	3	53
<i>Picea mariana</i>	6	40	6	48	4	19
<i>Salix sp.</i>	7	39	6	36	8	50
<i>Corylus cornuta</i>	11	37	11	31	12	53
<i>Viburnum nudum</i>	7	35	8	38	4	28
<i>Vaccinium myrtilloides</i>	6	35	6	40	2	22
<i>Cornus stolonifera</i>	7	34	6	25	8	56
<i>Viburnum edule</i>	3	33	3	34	4	28
<i>Sambucus racemosa</i>	3	33	3	36	3	25
<i>Diervilla lonicera</i>	5	32	6	33	2	28
<i>Ribes lacustre</i>	4	30	3	20	5	59
<i>Ribes triste</i>	2	29	2	25	2	41
<i>Vaccinium angustifolium</i>	3	25	3	31	2	9
<i>Populus tremuloides</i>	3	24	3	23	3	25
<i>Lonicera canadensis</i>	3	24	4	22	3	31
<i>Acer rubrum</i>	5	23	4	24	6	19
<i>Ilex mucronata</i>	4	22	5	28	3	6
<i>Prunus pensylvanica</i>	4	21	4	22	3	19
<i>Prunus virginiana</i>	3	18	3	15	3	25
<b>Shrub Stratum Cover (P<sub>10</sub> P<sub>25</sub> Mean P<sub>75</sub> P<sub>90</sub>)<sup>‡</sup></b>	<b>(32 49 68 92 99)</b>		<b>(44 49 70 99 99)</b>		<b>(32 49 62 83 99)</b>	
<b>Understory Herbs and Dwarf Shrubs</b>						
<i>Dryopteris spinulosa complex</i>	6	79	6	80	5	75
<i>Lysimachia borealis</i>	3	75	3	78	3	66



***Betula papyrifera* – *Abies balsamea* / *Alnus incana* CNVC00274**

**Vegetation Summary (cont'd)\***

Species Name <sup>†</sup>	Association CNVC00274		Subassociation 274a <i>typic</i>		Subassociation 274b <i>Rubus pubescens</i>	
	% Cover <sup>‡</sup>	% Presence <sup>^</sup>	% Cover <sup>‡</sup>	% Presence <sup>^</sup>	% Cover <sup>‡</sup>	% Presence <sup>^</sup>
<b><i>Rubus pubescens</i></b>	6	72	4	64	<b>9</b>	<b>94</b>
<i>Clintonia borealis</i>	5	71	6	79	4	47
<i>Cornus canadensis</i>	5	71	5	79	3	50
<i>Maianthemum canadense</i>	4	67	4	72	3	53
<i>Viola</i> sp.	4	66	4	63	3	75
<i>Coptis trifolia</i>	3	64	3	70	2	47
<i>Carex</i> sp.	6	63	5	59	7	75
<i>Gymnocarpium dryopteris</i>	3	61	3	61	5	63
<i>Oxalis montana</i>	6	57	6	61	6	47
<i>Poaceae</i>	5	57	5	57	5	56
<i>Aralia nudicaulis</i>	4	57	4	61	4	47
<i>Athyrium filix-femina</i>	8	49	6	43	13	66
<i>Linnaea borealis</i>	3	49	3	54	3	34
<i>Lycopodium annotinum</i>	15	38	15	41	18	28
<i>Equisetum</i> sp.	4	35	4	29	5	53
<i>Osmunda claytoniana</i>	4	32	4	26	4	47
<i>Phegopteris connectilis</i>	3	32	3	31	2	34
<i>Galium</i> sp.	3	31	2	24	3	50
<i>Mitella nuda</i>	3	29	3	18	4	56
<i>Lycopodium obscurum</i>	3	27	3	34	3	6
<i>Gaultheria hispidula</i>	2	27	2	33	2	9
<i>Eurybia macrophylla</i>	7	26	7	28	4	22
<i>Oclemena acuminata</i>	4	26	4	25	6	28
<i>Streptopus lanceolatus</i>	2	22	2	23	2	19
<i>Circaea alpina</i>	5	17	6	10	5	34
<i>Pteridium aquilinum</i>	5	17	5	21	3	6
<i>Trillium erectum</i>	2	14	2	11	2	22
<b>Herb Stratum Cover (P<sub>10</sub> P<sub>25</sub> Mean P<sub>75</sub> P<sub>90</sub>)<sup>‡</sup></b>	<b>(16 33 45 70 74)</b>		<b>(16 24 42 50 70)</b>		<b>(18 33 53 70 90)</b>	
<b>Bryophytes and Lichens</b>						
<i>Pleurozium schreberi</i>	6	82	6	83	5	78
<i>Dicranum</i> sp.	3	75	4	79	2	63
<i>Polytrichum</i> sp.	3	55	3	57	2	47
<i>Cladonia</i> sp.	2	46	2	47	2	44
<i>Sphagnum</i> sp.	7	42	9	43	3	41
<i>Ptilium crista-castrensis</i>	3	36	3	36	3	38
<i>Hylocomium splendens</i>	5	29	5	30	5	28
<i>Mnium</i> sp.	3	27	2	26	4	28
<i>Cladina rangiferina</i>	3	25	3	32	2	6
<i>Rhytidiadelphus triquetrus</i>	9	16	7	10	10	31
<i>Rhizomnium punctatum</i>	5	11	5	7	6	22
<b>Bryo-Lichen Stratum Cover (P<sub>10</sub> P<sub>25</sub> Mean P<sub>75</sub> P<sub>90</sub>)<sup>‡</sup></b>	<b>(3 3 18 24 33)</b>		<b>(3 3 19 33 33)</b>		<b>(3 3 17 16 48)</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 CNVC00274 119 plots	Subassociation 274a <i>typic</i> 87 plots	Subassociation 274b <i>Rubus pubescens</i> 32 plots
<b>Elevation Range (min–mean–max meters)</b>	20–320–680	20–318–655	50–326–680
<b>Slope Gradient (% frequency)</b>	steep (3) moderately steep (6) moderate (11) gentle (29) <b>level (52)</b>	steep (3) moderately steep (7) moderate (13) gentle (36) <b>level (41)</b>	steep (0) moderately steep (3) moderate (6) gentle (9) <b>level (81)</b>
<b>Aspect (% frequency)</b>	north (18) east (17) south (13) west (13) <b>level (40)</b>	north (21) east (15) south (15) west (15) <b>level (34)</b>	north (9) east (22) south (6) west (6) <b>level (56)</b>
<b>Meso Toposition (% frequency)</b>	crest / upper (7) <b>mid (38)</b> lower / toe (16) depression (5) level (34)	crest / upper (8) <b>mid (44)</b> lower / toe (18) depression (2) level (28)	crest / upper (3) mid (22) lower / toe (9) depression (13) <b>level (53)</b>
<b>Moisture Regime (% frequency)</b>	mesic (37) <b>moist (43)</b> wet (20)	mesic (40) <b>moist (46)</b> wet (14)	mesic (28) moist (34) <b>wet (38)</b>
<b>Nutrient Regime (% frequency)</b>	missing data (100)	missing data (100)	missing data (100)





***Betula papyrifera* – *Abies balsamea* / *Alnus incana* CNVC00274**

**Site / Soil Characteristics (cont'd)**

	Association CNVC00274	Subassociation 274a <i>typic</i>	Subassociation 274b <i>Rubus pubescens</i>
<b>Soil Parent Material (% frequency)</b>	colluvium (1) <b>moraine / till (53)</b> fluvial (4) glaciofluvial (4) glaciolacustrine (29) marine (4) organic (5)	colluvium (0) <b>moraine / till (57)</b> fluvial (3) glaciofluvial (2) glaciolacustrine (30) marine (3) organic (3)	colluvium (3) <b>moraine / till (41)</b> fluvial (6) glaciofluvial (9) glaciolacustrine (25) marine (6) organic (9)
<b>Soil Rooting Zone Substrate (% frequency)</b>	non-soil (1) sandy (3) coarse loamy (8) fine loamy (8) silty (3) clayey (6) organic (5) missing data (67)	non-soil (0) sandy (2) coarse loamy (9) fine loamy (6) silty (3) clayey (7) organic (3) missing data (69)	non-soil (3) sandy (3) coarse loamy (3) fine loamy (13) silty (3) clayey (3) organic (9) missing data (63)
<b>Root Restricting Depth (% frequency)</b>	0 – 20 cm (2) <b>21 – 99 cm (67)</b> missing data (31)	0 – 20 cm (2) <b>21 – 99 cm (66)</b> missing data (32)	0 – 20 cm (0) <b>21 – 99 cm (72)</b> missing data (28)
<b>Humus Form (% frequency)</b>	<b>mor (66)</b> moder (13) mull (8) peatymor (14)	<b>mor (72)</b> moder (15) mull (3) peatymor (9)	<b>mor (47)</b> moder (6) mull (19) peatymor (28)



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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:

CNVC00231 [*Abies balsamea* – *Betula papyrifera* – *Populus tremuloides* / *Clintonia borealis*] occurs on mesic, nutrient-medium sites in the same range. It often has *Populus tremuloides* in the canopy and lacks a well-developed tall shrub layer containing *Alnus incana*.

CNVC00232 [*Abies balsamea* – *Betula papyrifera* / *Pleurozium schreberi*] occurs on mesic, nutrient-medium sites in the same range and lacks a well-developed tall shrub layer containing *Alnus incana*.

CNVC00233 [*Abies balsamea* – *Betula papyrifera* / *Oxalis montana* / *Pleurozium schreberi*] occurs on mesic, nutrient-medium sites in the same range, often at higher elevations. It lacks a well-developed tall shrub layer containing *Alnus incana*.

CNVC00235 [*Abies balsamea* – *Betula papyrifera* / *Acer spicatum*] occurs on sites that are not quite as moist or rich in the same range. It has a dense tall shrub layer with abundant *Acer spicatum*, but lacks *Alnus incana*.

CNVC00273 [*Populus tremuloides* – *Betula papyrifera* – *Abies balsamea* / *Alnus incana*] occurs on comparable sites in the same range, but *Populus tremuloides* is the dominant hardwood species in the canopy.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

### Comments

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





***Betula papyrifera* – *Abies balsamea* / *Alnus incana* CNVC00274**

**Source Information**

**Number of source plots for CNVC00274:** 119

**Number of source plots for 274a *typic*:** 87

**Number of source plots for 274b *Rubus pubescens*:** 32

**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:** January, 2011

**Date of Description:** May, 2017

**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.

Gosselin, J.; Grondin, P.; Saucier, J.-P. 1998. Rapport de classification écologique du sous-domaine bioclimatique de la sapinière à bouleau jaune de l'ouest. Min. des Res. nat. du Qué., Dir. de la gestion des stocks forestiers, QC.

Grondin, P.; Blouin, J.; Racine, P. 1998. Rapport de classification écologique du sous-domaine bioclimatique de la sapinière à bouleau blanc de l'ouest. Min. des Res. nat. du Qué., Dir. des inv. for., QC.

Grondin, P.; Blouin, J.; Racine, P. 1999. Rapport de classification écologique du sous-domaine bioclimatique de la sapinière à bouleau jaune de l'est. Min. des Res. nat. du Qué., Dir. des inv. for., QC.

Grondin, P.; Blouin, J.; Racine, P.; D'Avignon, H.; Tremblay, S. 2000. Rapport de classification écologique du sous-domaine bioclimatique de la sapinière à bouleau blanc de l'est. Forêt Qué., Dir. des inv. for., Min. des Res. nat. du Qué., QC.

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Canadian National Vegetation Classification (CNVC)  
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***Betula papyrifera* – *Abies balsamea* / *Alnus incana* CNVC00274**

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