



Forest / Forêt

Association CNVC00242

Betula papyrifera* / *Alnus incana

Paper Birch / Speckled Alder

Bouleau à papier / Aulne rugueux

Subassociations: none

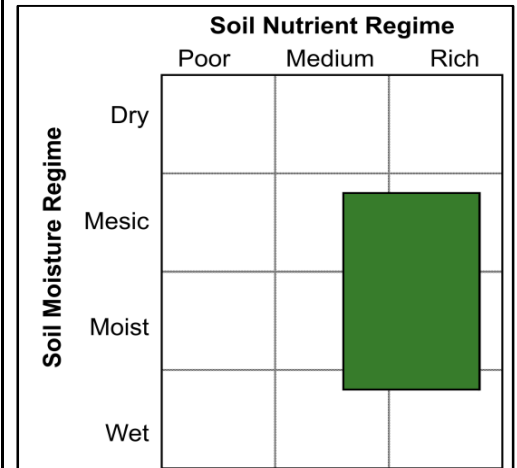
CNVC Alliance: CA00018 *Betula papyrifera* – *Abies balsamea* / *Alnus incana*

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

Type Description

Concept: CNVC00242 is a boreal hardwood forest Association that occurs in Quebec. It has a closed canopy dominated by paper birch (*Betula papyrifera*), often with a minor component of balsam fir (*Abies balsamea*). The dense tall shrub layer is dominated by speckled alder (*Alnus incana*), with lower abundance of balsam fir regeneration and mountain maple (*Acer spicatum*). Paper birch saplings, red raspberry (*Rubus idaeus*), American mountain-ash (*Sorbus americana*), skunk currant (*Ribes glandulosum*) and serviceberries (*Amelanchier* spp.) are also common in the shrub layer. The herb layer is well developed and commonly includes wood ferns (*Dryopteris* spp.), yellow clintonia (*Clintonia borealis*), bunchberry (*Cornus canadensis*), northern starflower (*Lysimachia borealis*), wild lily-of-the-valley (*Maianthemum canadense*), sedges (*Carex* spp.), wild sarsaparilla (*Aralia nudicaulis*), goldthread (*Coptis trifolia*) and grasses (*Poaceae*). 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*). CNVC00242 occurs in a region with a humid continental boreal climate, usually on mesic to moist, nutrient-rich sites that are some of the most productive sites in the region. It is an early seral condition that usually develops after fire or harvesting but can also result from spruce budworm (*Choristoneura fumiferana*) outbreak.

Vegetation: CNVC00242 is a hardwood forest Association with a closed canopy dominated by *Betula papyrifera*, usually with a minor amount of *Abies balsamea*. The shrub layer is dense and dominated by the tall shrub *Alnus incana* (see Comments), often with significant amounts of regenerating *A. balsamea* and *Acer spicatum*. Other common species in the shrub layer include *B. papyrifera*, *Rubus idaeus*, *Sorbus americana*, *Ribes glandulosum* and *Amelanchier* spp. The herb layer is usually well developed and typically includes *Dryopteris* spp., *Clintonia borealis*, *Cornus canadensis*, *Lysimachia borealis*, *Maianthemum canadense*, *Carex* spp., *Aralia nudicaulis*, *Coptis trifolia* and various grasses. Forest floor cover is predominantly broad-leaf litter, so the moss layer is poorly developed, with only *Pleurozium schreberi* common, mainly on fallen logs and at the base of trees.





***Betula papyrifera* / *Alnus incana* CNVC00242**

Type Description (cont'd)

Environment: CNVC00242 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 gently to moderately graded morainal slopes on water-receiving, middle to lower or toe-slope topographies. They also occur on the more level terrain of glaciolacustrine deposits, especially on the Clay Belt in western Quebec. Soils are usually moderately 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 finer textured with imperfect drainage. Both site conditions support *Alnus incana*, a shrub that fixes nitrogen, further enriching the soil nutrient status. Mor humus forms are common, but compared to other boreal Associations, moders are relatively frequent. Peatmors can develop on wetter sites.

Within the range of CNVC00242 regional fire cycles are intermediate (100-270 years), long (270-500 years) or even very long (>500 years). However, these stands often exist where there are natural fire breaks (e.g., water bodies) and are less prone to fire because of their moisture status. Where the regional fire cycle is intermediate, stands are less likely to burn than the surrounding landscape.

Dynamics: CNVC00242 is an early seral condition that typically establishes after fire, but can also result from harvesting. *Betula papyrifera* is a pioneer species adapted to disturbance. It produces abundant, light, wind-dispersed seeds that can readily colonize mineral soil seedbeds exposed by disturbance. It can also reproduce vegetatively from stump sprouts. It grows rapidly in full-light conditions but is intolerant of shade so does not replace itself in a stand without further disturbance. If seed sources are available, shade tolerant conifers (*Abies balsamea* or *Picea glauca*) can become established in these stands and may grow into the canopy as *B. papyrifera* declines, forming a mid-seral mixedwood Association such as CNVC00274 [*Betula papyrifera* – *Abies balsamea* / *Alnus incana*]. In the prolonged absence of disturbance, these stands could succeed to a late seral Association such as CNVC00297 [*Abies balsamea* / *Alnus incana*].

Occasionally, CNVC00242 can result when a severe outbreak of spruce budworm (*Choristoneura fumiferana*) eliminates *A. balsamea* from the canopy of mid- or late seral stands. The resulting stand of CNVC00242 is typically short lived, since surviving *A. balsamea* in the understory can quickly grow into the canopy, returning these stands to their pre-disturbance condition.

Alnus incana can form dense thickets in canopy openings, 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 *A. incana* can survive even high-severity fires and it can respond quickly after disturbance by sprouting. Being semi-shade tolerant, *A. incana* persists as the canopy closes, limiting available light for plants beneath it.

Range: CNVC00242 occurs in the boreal region of Quebec. It extends from the Ontario border to the Upper North Shore of the Gulf of Saint Lawrence near Sept-Îles and the south shore of the Saint Lawrence River near Rivière-du-Loup. Stands are described from as far north as Lake Mistassini. CNVC00242 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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 Paper Birch / Speckled Alder
 Bouleau à papier / Aulne rugueux

Distribution

Countries: Canada

Provinces / Territories / States: Quebec

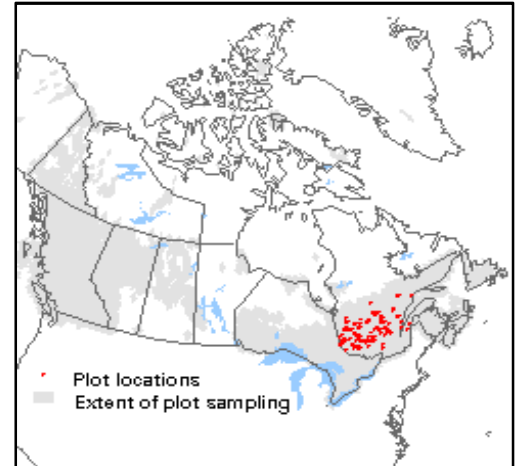
Terrestrial Ecozones and Ecoregions of Canada: Atlantic Highlands: Appalachians; Boreal Shield: Abitibi Plains, Central Laurentians, Lake Timiskaming Lowland, Rivière Rupert Plateau, Southern Laurentians

Rowe's Forest Regions and Sections of Canada: Boreal: Chibougamau-Natashquan, Gouin, Laurentide-Onatchiway, Missinaibi-Cabonga, Northern Clay; Great Lakes-St. Lawrence: Algonquin-Pontiac, Haileybury Clay, Laurentian, Middle Ottawa, Saguenay, Temiscouata-Restigouche, Timagami

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

CNVC00242

Quebec

QC104

Betula papyrifera / *Alnus incana*



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Vegetation Summary*

Species Name ^T	Association CNVC00242 93 plots	
	% Cover [±]	% Presence ^A
Overstory Trees		
<i>Betula papyrifera</i>	34	100
<i>Abies balsamea</i>	8	58
<i>Picea mariana</i>	6	51
<i>Prunus pensylvanica</i>	10	45
<i>Populus tremuloides</i>	18	37
<i>Picea glauca</i>	5	32
<i>Sorbus americana</i>	6	30
Tree Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(32 49 63 83 99)	
Understory Woody Shrubs and Regenerating Trees		
<i>Alnus incana</i>	44	91
<i>Abies balsamea</i>	14	86
<i>Betula papyrifera</i>	6	74
<i>Rubus idaeus</i>	9	73
<i>Acer spicatum</i>	12	71
<i>Sorbus americana</i>	6	71
<i>Ribes glandulosum</i>	4	71
<i>Amelanchier sp.</i>	4	62
<i>Picea mariana</i>	5	56
<i>Prunus pensylvanica</i>	4	54
<i>Viburnum nudum</i>	10	52
<i>Salix sp.</i>	6	48
<i>Vaccinium myrtilloides</i>	4	46
<i>Picea glauca</i>	3	42
<i>Vaccinium angustifolium</i>	3	37
<i>Ilex mucronata</i>	5	33
<i>Sambucus racemosa</i>	3	33
<i>Corylus cornuta</i>	8	32
<i>Diervilla lonicera</i>	7	31
<i>Populus tremuloides</i>	4	28
<i>Viburnum edule</i>	3	28
<i>Acer rubrum</i>	6	24
<i>Kalmia angustifolia</i>	6	23
Shrub Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(49 66 76 99 99)	
Understory Herbs and Dwarf Shrubs		
<i>Dryopteris spinulosa complex</i>	7	86
<i>Clintonia borealis</i>	7	86
<i>Cornus canadensis</i>	6	82
<i>Lysimachia borealis</i>	3	76



***Betula papyrifera* / *Alnus incana* CNVC00242**

Vegetation Summary (cont'd)*

Species Name [†]	Association CNVC00242	
	% Cover [‡]	% Presence [^]
<i>Maianthemum canadense</i>	4	74
<i>Carex</i> sp.	4	67
<i>Aralia nudicaulis</i>	4	67
<i>Coptis trifolia</i>	3	67
Poaceae	8	63
<i>Oxalis montana</i>	5	58
<i>Viola</i> sp.	4	57
<i>Rubus pubescens</i>	4	53
<i>Lycopodium obscurum</i>	3	51
<i>Lycopodium annotinum</i>	12	44
<i>Linnaea borealis</i>	2	44
<i>Eurybia macrophylla</i>	7	40
<i>Athyrium filix-femina</i>	5	38
<i>Gymnocarpium dryopteris</i>	2	35
<i>Equisetum</i> sp.	4	33
<i>Osmunda claytoniana</i>	4	31
<i>Oclemena acuminata</i>	4	28
<i>Phegopteris connectilis</i>	3	27
<i>Gaultheria hispidula</i>	2	27
<i>Pteridium aquilinum</i>	7	26
<i>Streptopus lanceolatus</i>	2	24
Herb Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(16 16 42 50 70)	
Bryophytes and Lichens		
<i>Pleurozium schreberi</i>	6	82
<i>Dicranum</i> sp.	3	78
<i>Polytrichum</i> sp.	3	57
<i>Sphagnum</i> sp.	9	48
<i>Cladonia</i> sp.	2	47
<i>Ptilium crista-castrensis</i>	3	34
<i>Cladina rangiferina</i>	2	34
<i>Hylocomium splendens</i>	3	24
<i>Sphagnum girgensohnii</i>	7	20
Bryo-Lichen Stratum Cover		
(P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(3 3 14 16 33)	

* 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

CNVC00242

93 plots

Elevation Range (min–mean–max meters)

70–356–630

Slope Gradient (% frequency)

very steep (1)
steep (1)
moderately steep (5)
moderate (22)
gentle (30)
level (41)

Aspect (% frequency)

north (15)
east (14)
south (13)
west (23)
level (35)

Meso Toposition (% frequency)

crest / upper (9)
mid (39)
lower / toe (16)
depression (5)
level (31)

Moisture Regime (% frequency)

dry (1)
mesic (44)
moist (44)
wet (11)

Nutrient Regime (% frequency)

missing data (100)



***Betula papyrifera* / *Alnus incana* CNVC00242**

Site / Soil Characteristics (cont'd)

Association
CNVC00242

Soil Parent Material (% frequency)

bedrock (1)
moraine / till (66)
fluvial (2)
glaciofluvial (3)
lacustrine (1)
glaciolacustrine (19)
marine (4)
organic (3)

Soil Rooting Zone Substrate (% frequency)

non-soil (1)
sandy (3)
coarse loamy (11)
fine loamy (3)
silty (2)
clayey (5)
organic (4)
missing data (70)

Root Restricting Depth (% frequency)

0 – 20 cm (4)
21 – 99 cm (76)
missing data (19)

Humus Form (% frequency)

mor (71)
moder (17)
mull (2)
peatymor (10)



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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:

CNVC00237 [*Betula papyrifera* / *Vaccinium angustifolium* – *Kalmia angustifolia* / *Pleurozium schreberi*] occurs on drier, poorer sites in the same range and has abundant ericaceous species, rather than *Alnus incana*, in the shrub layer.

CNVC00238 [*Populus tremuloides* (*Betula papyrifera*) / *Diervilla lonicera*] occurs on drier, poorer sites in the same range and lacks a dense tall shrub layer of *Alnus incana*.

CNVC00239 [*Betula papyrifera* (*Populus tremuloides*) / *Acer spicatum* / *Clintonia borealis*] occurs on sites that are not quite as moist or rich in the same range and has more *Acer spicatum* and less *Alnus incana* in the shrub layer.

CNVC00241 [*Populus tremuloides* (*P. balsamifera*) / *Alnus incana* / *Eurybia macrophylla*] occurs in the same range, usually on glaciolacustrine, rather than morainal deposits, and *Populus tremuloides* or *P. balsamifera* dominate the overstory.

CNVC00316 [*Betula papyrifera* / *Alnus viridis* / *Solidago macrophylla*] occurs on insular Newfoundland on moist, rich sites and lacks a tall shrub layer of *Alnus incana*.

CNVC00349 [*Betula papyrifera* (*Populus tremuloides*) / *Dryopteris carthusiana* – *Rubus pubescens*] occurs in Newfoundland and Labrador on moist, rich sites and lacks a tall shrub layer of *Alnus incana*.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

Comments

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



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

<http://cnvc-cnvc.ca>

***Betula papyrifera* / *Alnus incana* CNVC00242**

Source Information

Number of source plots for CNVC00242: 93

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: March, 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.

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.

Characterization References:

Baskerville, G.L. 1975. Spruce budworm: super silviculturist. *For. Chron.* 51(4):138-140.

Bergeron, Y. 2000. Species and stand dynamics in the mixed woods of Quebec's southern boreal forest. *Ecology* 81(6):1500-1516.

Bergeron, Y.; Chen, H.Y.H.; Kenkel, N.C.; Leduc, A.; Macdonald, S.E. 2014. Boreal mixedwood stand dynamics: ecological processes underlying multiple pathways. *For. Chron.* 90(2):202-213.

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Gauthier, S.; Raulier, F.; Robitaille, A.; Chabot, M.; Duval, J.; Lord, D. 2013. Vulnérabilité face au risque de feu: description du critère et de l'indicateur, justification des seuils, méthode retenue et résultats détaillés. Chapitre 4 dans Rapport du Comité scientifique chargé d'examiner la limite nordique des forêts attribuables. Min. des Res. nat. du Qué., Sect. des for., QC.

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.

Jobidon, R. 1995. Autécologie de quelques espèces de compétition d'importance pour la régénération forestière au Québec. *Revue de littérature*. Min. des Res. nat., Dir. de la rech. for., QC. Mémoire de recherche forestière n° 117.

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.

Kneeshaw, D.D.; Bergeron, Y. 1998. Canopy gap characteristics and tree replacement in the southeastern boreal forest. *Ecology* 79(3):783-794.

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

Ministère des Ressources naturelles. 2013. Le guide sylvicole du Québec, Tome 1, Les fondements biologiques de la sylviculture. Ouvrage collectif sous la supervision de B. Boulet et M. Huot. Les Publications du Québec, QC. 1044.

Ministère des Ressources naturelles du Québec, Forêt Québec. 2002+. Les guides de reconnaissance des types écologiques. Gouv. du Québec, Québec, QC. Available: <http://www.mffp.gouv.qc.ca/forets/inventaire/guide-types-ecologiques-carte.jsp> (accessed: May 2015).



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<http://cnvc-cnvc.ca>

***Betula papyrifera* / *Alnus incana* CNVC00242**

Characterization References (cont'd):

Uchytel, 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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