Forest / Forêt **Association CNVC00315**

Betula papyrifera – B. alleghaniensis / Dryopteris carthusiana

Paper Birch – Yellow Birch / Spinulose Wood Fern

Bouleau à papier – Bouleau jaune / Dryoptère spinuleuse

Subassociations: *315a typic, 315b Clintonia borealis*
CNVC Alliance: CA00007 *Abies balsamea (Betula papyrifera – B. alleghaniensis) / Dryopteris carthusiana*
CNVC Group: CG0003 Atlantic Boreal Mesic Balsam Fir – Paper Birch – White Spruce Forest

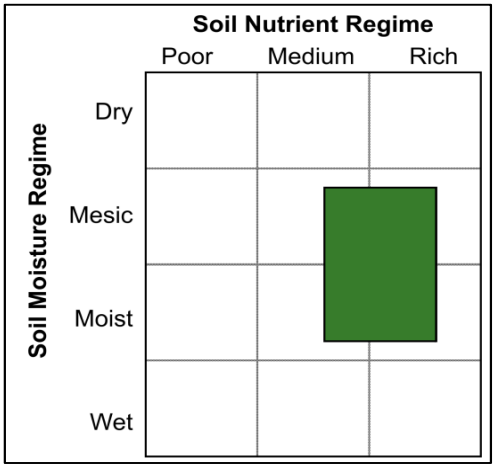
Type Description

Concept: CNVC00315 is a boreal hardwood forest Association that occurs in the southern part of insular Newfoundland. It has a closed canopy dominated by paper birch (*Betula papyrifera*) and yellow birch (*B. alleghaniensis*), with a minor component of balsam fir (*Abies balsamea*). The shrub layer is usually sparse, sometimes consisting only of regenerating balsam fir. The dense herb layer is characterized by abundant wood ferns, especially spinulose wood fern (*Dryopteris carthusiana*) and evergreen wood fern (*D. intermedia*). Other herb species that underlie the ferns include bunchberry (*Cornus canadensis*), northern starflower (*Lysimachia borealis*), stiff clubmoss (*Lycopodium annotinum*) and wild lily-of-the-valley (*Maianthemum canadense*). The moss layer is sparse or nonexistent because of abundant fern and broad-leaf litter, although minor amounts of *Dicranum scoparium, Hylocomium splendens* and *Pleurozium schreberi* can be present. CNVC00315 occurs in a region with a humid to very humid, maritime-influenced boreal climate. It is typically found on mesic to moist, nutrient-medium to rich sites. These are some of the most productive sites in Newfoundland. CNVC00315 is an early seral condition that typically establishes after fire or other stand-replacing disturbance that results in failure of balsam fir regeneration. There are two subassociations, *typic* and *Clintonia borealis*.

Vegetation: CNVC00315 is a hardwood forest Association with a closed canopy dominated by *Betula papyrifera* (see Comments) and *B. alleghaniensis*, with a minor component of *Abies balsamea*. The shrub layer is poorly developed, often containing only regenerating *A. balsamea*. Dense cover of *Dryopteris carthusiana*, sometimes with *D. intermedia*, characterizes this Association. *Cornus canadensis, Lysimachia borealis, Lycopodium annotinum* and *Maianthemum canadense* typically accompany the ferns in the herb layer. The moss layer is sparse or nonexistent because of abundant fern and broad-leaf litter, although minor amounts of *Dicranum scoparium, Hylocomium splendens* and *Pleurozium schreberi* can be present. Compared to the *typic* subassociation, the *Clintonia borealis* subassociation contains *Acer spicatum* in the shrub layer and greater forb diversity in the herb layer; *D. intermedia* and *C. borealis* can be abundant.

Environment: CNVC00315 occurs in a humid to very humid maritime-influenced boreal climate where the regional fire cycle is long (270-500 years). It is found most frequently on mesic to moist, nutrient-medium to rich sites; these are among the most productive sites in Newfoundland. Stands are usually on level sites or moderate slopes. Soils are typically loamy and occur on morainal deposits that are derived from slate or shale bedrock. Seepage enhances the moisture and nutrient availability on these sites. Mor humus forms are typical, but mulls can develop from the abundant broad-leaf litter.

Source: B. Meades



Betula papyrifera – B. alleghaniensis / Dryopteris carthusiana CNVC00315

Type Description (cont'd)

Dynamics: CNVC00315 is an early seral Association that typically develops as a result of *Abies balsamea* regeneration failure following disturbance. Because wildfires are generally absent from the humid coastal environments in which CNVC00315 occurs, this scenario is relatively uncommon. CNVC00315 could replace Associations such as CNVC00311 [*Abies balsamea (Betula alleghaniensis) / Dryopteris carthusiana*] or CNVC00310 [*Abies balsamea / Dryopteris* spp. / *Hylocomiastrum umbratum*] after fire or harvesting.

When fires do occur, they are usually of anthropogenic origin and are rarely extensive. Fire eliminates *A. balsamea*; early seral hardwoods such as *Betula alleghaniensis* and *B. papyrifera* are likely to dominate the initial post-fire stand on these sites because they produce abundant, light, wind-dispersed seeds that can readily colonize mineral soil seedbeds exposed by disturbance, forming CNVC00315. Over time, as humus builds up in a stand, *A. balsamea* seedlings are better able to establish and survive in the low-light environment than are *Betula* seedlings. *A. balsamea* persists in the understory as advanced regeneration until being released by further canopy disturbance, such as natural mortality of overstory trees or a windthrow event. Thus, these sites usually return to the mixedwood (CNVC00311) or conifer (CNVC00310) condition over time. Sometimes, when harvesting is followed by fire, regeneration of both *Betula* spp. and *A. balsamea* can fail, leading to long-term occupation of the site by *Acer spicatum* thickets.

Range: CNVC00311 is described from western Newfoundland but can occur within the range of *Betula alleghaniensis* in southern Newfoundland, from Corner Brook to the central Avalon Peninsula, at elevations less than 300 mASL.

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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Paper Birch – Yellow Birch / Spinulose Wood Fern

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Distribution

Countries: Canada

Provinces / Territories / States: Newfoundland and Labrador

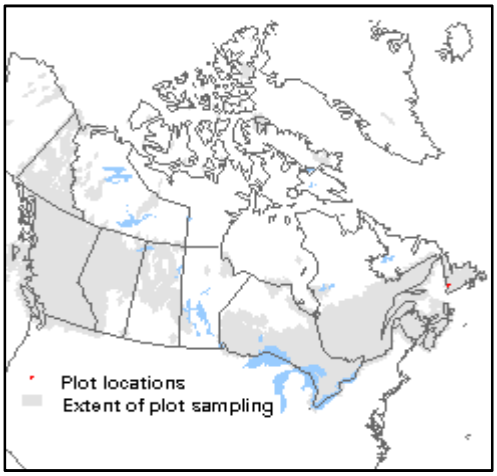
Terrestrial Ecozones and Ecoregions of Canada: Boreal Shield: Southwestern Newfoundland

Rowe's Forest Regions and Sections of Canada: Boreal: Corner Brook

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

Nature Conservancy of Canada Ecoregions: Boreal Shield

Ecoregions of Newfoundland: Southwestern Newfoundland



Corresponding Types and Associations

315a typic	Newfoundland and Labrador	W Bd	Western: Dryopteris - birch forest [typical variant]
315b Clintonia borealis	Newfoundland and Labrador	W Bdc	Western: Dryopteris - birch forest [Clintonia variant]

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Betula papyrifera – B. alleghaniensis / Dryopteris carthusiana

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Vegetation Summary*

	Association CNVC00315		Subassociation 315a *typic*		Subassociation 315b *Clintonia borealis*	
	6 plots		**3 plots**		**3 plots**	
Species Name[†]	% Cover[±]	% Presence^	% Cover[±]	% Presence^	% Cover[±]	% Presence^
Overstory Trees						
Betula papyrifera	**33**	**100**	**34**	**100**	**32**	**100**
Abies balsamea	9	100	14	100	3	100
Betula alleghaniensis	**30**	**83**	**17**	**67**	**38**	**100**
Picea glauca	1	33	-	-	1	67
Prunus pensylvanica	4	17	-	-	4	33
Tree Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(43 59 67 80 86)**		**(35 43 59 74 83)**		**(68 72 75 80 81)**	
Understory Woody Shrubs and Regenerating Trees						
Abies balsamea	11	83	2	100	24	67
Acer spicatum	3	50	-	-	3	100
Sambucus racemosa	3	50	3	67	2	33
Ribes glandulosum	1	50	1	67	1	33
Rubus idaeus	1	33	1	33	1	33
Sorbus americana	1	33	1	33	1	33
Taxus canadensis	1	17	-	-	1	33
Shrub Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(4 6 13 12 27)**		**(4 4 5 6 7)**		**(10 11 21 27 35)**	
Understory Herbs and Dwarf Shrubs						
Dryopteris carthusiana	**71**	**100**	**88**	**100**	**55**	**100**
Cornus canadensis	6	100	4	100	7	100
Lysimachia borealis	6	100	8	100	3	100
Lycopodium annotinum	5	83	10	67	2	100
Maianthemum canadense	19	67	19	33	19	100
Dryopteris intermedia	19	50	1	33	29	67
Clintonia borealis	19	33	-	-	**19**	**67**
Monotropa uniflora	2	33	-	-	2	67
Streptopus lanceolatus	2	33	-	-	2	67
Viola blanda	2	33	-	-	2	67
Phegopteris connectilis	2	17	-	-	2	33
Lycopodium obscurum	1	17	1	33	-	-
Nabalus trifoliolatus	1	17	-	-	1	33
Herb Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})[‡]	**(98 100 99 100 100)**		**(96 98 98 100 100)**		**(100 100 100 100 100)**	
Bryophytes and Lichens						
Dicranum scoparium	2	83	2	100	3	67
Hylocomium splendens	3	67	3	67	2	67
Pleurozium schreberi	2	67	3	67	1	67
Polytrichum commune	2	50	3	67	1	33

Betula papyrifera – B. alleghaniensis / Dryopteris carthusiana CNVC00315

Vegetation Summary (cont'd)*

Species Name†	Association CNVC00315 % Cover±	Association CNVC00315 % Presence^	Subassociation 315a *typic* % Cover±	Subassociation 315a *typic* % Presence^	Subassociation 315b *Clintonia borealis* % Cover±	Subassociation 315b *Clintonia borealis* % Presence^
Rhytidiadelphus loreus	1	50	1	33	1	67
Hylocomiastrum umbratum	2	33	2	33	2	33
Brachythecium rutabulum	1	33	1	33	1	33
Ptilium crista-castrensis	1	33	1	33	1	33
Bryhnia novae-angliae	1	17	-	-	1	33
Dicranum majus	1	17	-	-	1	33
Hypnum imponens	1	17	-	-	1	33
Pogonatum urnigerum	1	17	1	33	-	-
Bryo-Lichen Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(2 4 8 12 14)**		**(4 6 9 13 15)**		**(2 4 7 10 12)**	

* 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)

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Bouleau à papier – Bouleau jaune / Dryoptère spinuleuse

Site / Soil Characteristics

	Association CNVC00315 **6 plots**	Subassociation 315a *typic* **3 plots**	Subassociation 315b *Clintonia borealis* **3 plots**
Elevation Range (min–mean–max meters)			
	107–150–244	122–173–244	107–127–168
Slope Gradient (% frequency)			
	moderate (17) gentle (33) **level (50)**	moderate (33) **gentle (67)** level (0)	moderate (0) gentle (0) **level (100)**
Aspect (% frequency)			
	north (17) east (33) south (17) west (33)	north (33) east (0) south (33) west (33)	north (0) **east (67)** south (0) west (33)
Meso Topoposition (% frequency)			
	missing data (100)	missing data (100)	missing data (100)
Moisture Regime (% frequency)			
	moist (100)	**moist (100)**	**moist (100)**
Nutrient Regime (% frequency)			
	missing data (100)	missing data (100)	missing data (100)
Soil Parent Material (% frequency)			
	moraine / till (100)	**moraine / till (100)**	**moraine / till (100)**
Soil Rooting Zone Substrate (% frequency)			
	missing data (100)	missing data (100)	missing data (100)
Root Restricting Depth (% frequency)			
	missing data (100)	missing data (100)	missing data (100)
Humus Form (% frequency)			
	mor (33) missing data (67)	mor (0) missing data (100)	**mor (67)** missing data (33)

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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:

CNVC00311 [*Abies balsamea (Betula alleghaniensis) / Dryopteris carthusiana*] is a similar mixedwood Association that occurs on comparable sites in the same range (see Dynamics).

CNVC00316 [*Betula papyrifera / Alnus viridis / Solidago macrophylla*] occurs on unstable scree slopes in western Newfoundland. It lacks the dense layer of *Dryopteris* spp. in the understory that characterizes CNVC00315.

CNVC00349 [*Betula papyrifera (Populus tremuloides) / Dryopteris carthusiana – Rubus pubescens*] occurs on moister, richer sites in Newfoundland and Labrador. It often has *Populus tremuloides* in the overstory and has a more diverse understory with greater frequency of more nutrient-demanding species.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

CNVC00315 includes the concepts of Bd #28 [Dryopteris – Birch] and Bdc #25 [Dryopteris – Clintonia – Birch] from Meades & Moores 1994.

Comments

In the general context of boreal forests, this Association is notable for its content of *Betula alleghaniensis*, which is usually considered a temperate species. CNVC00315 lacks understory species typically associated with temperate forests however, so is classified here as a boreal forest Association.

CNVC00315 is absent from the more continental interior of Newfoundland where fire is more frequent.

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

Source Information

Number of source plots for CNVC00315: 6
Number of source plots for 315a typic: 3
Number of source plots for 315b Clintonia borealis: 3
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, 2012
Date of Description: October, 2016

Betula papyrifera – B. alleghaniensis / Dryopteris carthusiana CNVC00315

Classification References:

Damman, A.W.H. 1967. The forest vegetation of western Newfoundland and site degradation associated with vegetation change. PhD thesis, Univ. of Michigan, Ann Arbor, MI, US.

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Characterization References:

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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).

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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: *Betula papyrifera – B. alleghaniensis / Dryopteris carthusiana* [online]. Sault Ste. Marie, Ontario, Canada : Canadian National Vegetation Classification generated Oct/24/2016; cited ENTER DATE ACCESSED. 8 p. Canadian National Vegetation Classification Association: CNVC00315. Available from http://cnvc-cnvc/ca. System Requirements: Adobe Acrobat Reader v. 7.0 or higher. ISSN 1916-3266.