



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

<http://cnvc-cnvc.ca>

Forest / Forêt

Association CNVC00225

Abies balsamea (Picea glauca) / Acer spicatum / Oxalis montana
Balsam Fir (White Spruce) / Mountain Maple / Common Wood-sorrel
Sapin baumier (Épinette blanche) / Érable à épis / Oxalide de montagne

Subassociations: 225a *typic*, 225b *Rubus pubescens*

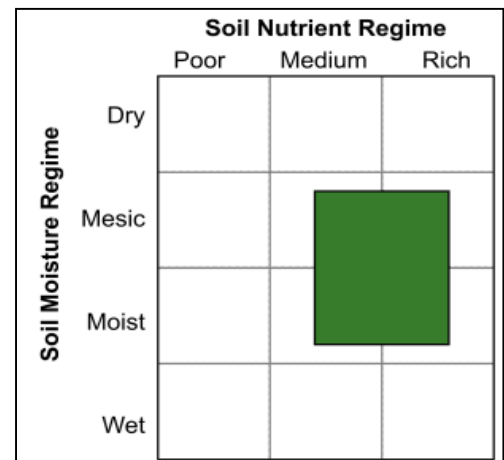
CNVC Alliance: CA00006 *Abies balsamea – Picea glauca / Acer spicatum / Oxalis montana*

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

Type Description

Concept: CNVC00225 is a boreal coniferous forest Association that occurs in Quebec, New Brunswick and Nova Scotia. It has a closed canopy dominated by balsam fir (*Abies balsamea*), frequently with lower abundance of white spruce (*Picea glauca*) and paper birch (*Betula papyrifera*). The shrub layer is well developed and dominated by roughly equal proportions of mountain maple (*Acer spicatum*) and regenerating balsam fir, with less abundant paper birch and white spruce regeneration. The herb layer is moderately developed, typically with low cover of wild sarsaparilla (*Aralia nudicaulis*), yellow clintonia (*Clintonia borealis*), bunchberry (*Cornus canadensis*), northern starflower (*Lysimachia borealis*), common wood sorrel (*Oxalis montana*), wild lily-of-the-valley (*Maianthemum canadense*), goldthread (*Coptis trifolia*) and twinflower (*Linnaea borealis*). The moderately developed moss layer consists of red-stemmed feathermoss (*Pleurozium schreberi*), knight's plume moss (*Ptilium crista-castrensis*), stairstep moss (*Hylocomium splendens*) and broom mosses (*Dicranum* spp.). CNVC00225 occurs in a region with a boreal climate that grades from humid continental in the western portion of its range to very humid and more maritime in the east. It is most common on mesic to moist, nutrient-medium to rich sites. It is a late seral condition that occurs where fire has been absent for a long period. Insect outbreaks and windthrow are the primary natural disturbances. The canopy gaps or large patches that result from these disturbances promote self-replacement of this Association by the release of balsam fir regeneration. Two subassociations are recognized, *typic* and *Rubus pubescens*.

Vegetation: CNVC00225 is a coniferous forest Association with a closed canopy dominated by *Abies balsamea*, usually with lower abundance of *Picea glauca* and *Betula papyrifera*. The shrub layer is well developed with abundant *Acer spicatum* and regenerating *A. balsamea*. Regenerating *B. papyrifera* and *P. glauca* are common but less abundant, as are a variety of shrub species. The herb layer is moderately developed and relatively diverse, with low abundance of a large number of species, including *Aralia nudicaulis*, *Clintonia borealis*, *Cornus canadensis*, *Lysimachia borealis*, *Oxalis montana*, *Maianthemum canadense*, *Coptis trifolia* and *Linnaea borealis*. The moderately developed moss layer consists mainly of the feathermosses *Pleurozium schreberi*, *Ptilium crista-castrensis* and *Hylocomium splendens*. Compared to the *typic* subassociation, the *Rubus pubescens* subassociation has higher species diversity with greater abundance of more nutrient-demanding species, such as the shrubs *Ribes lacustre* and *Rubus idaeus*, and herb layer species, such as *Rubus pubescens*, *Gymnocarpium dryopteris*, *Viola* spp., *Streptopus lanceolatus*, *Phegopteris connectilis* and *Mitella nuda*.





***Abies balsamea (Picea glauca) / Acer spicatum / Oxalis montana* CNVC00225**

Type Description (cont'd)

Environment: CNVC00225 occurs in a boreal climate that grades from humid and continental in the western part of its range to very humid and more maritime in the east and becomes increasingly temperate farther south. It is found most frequently on sites that are mesic to moist and nutrient-medium to rich; these are some of the most productive sites in this region of the boreal. Stands are usually on level or gentle to moderately steep slopes, often on water-receiving middle to lower-slope topositions. Seepage often enhances moisture and nutrient availability on these sites. Soils are usually moderately deep to deep and often coarse-textured and well drained. They are often derived from morainal parent materials, but, especially in the Appalachian region, colluvial parent materials are relatively common. In the less humid, more continental climate of the western part of its range, stands typically occur on glaciolacustrine or glaciomarine silts and clays that retain adequate moisture and nutrients for the development of CNVC00225. Mor humus forms are common, but compared to other boreal Associations, moders and mulls are more likely to develop. Compared to the *typic*, the *Rubus pubescens* subassociation is on slightly moister and more nutrient-rich sites; these sites may have greater seepage than *typic* sites.

CNVC00225 occurs where regional fire cycles are very long (>500 years), long (270-500 years) or intermediate (100-270 years). Where the regional fire cycle is intermediate, stands likely occur on sites that have escaped fire.

Dynamics: CNVC00225 is a self-perpetuating, late successional forest Association. 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 or other factors. Extensive insect 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 *Abies balsamea*. Following disturbance, stands tend to recover through the release of abundant *A. balsamea* in the understory. Small-scale gap or patch disturbances typically result in an uneven-age structure within stands, but severe large-scale disturbances can release understory trees that are more or less the same age. Severe insect epidemics can enhance the proportions of *Betula papyrifera* and *Picea glauca* 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.

When fires do occur, *A. balsamea* is eliminated. Instead, *B. papyrifera* is likely to dominate the initial post-fire stand on these sites (e.g., CNVC00239 [*Betula papyrifera (Populus tremuloides) / Acer spicatum / Clintonia borealis*]). Over time, however, the stand is likely to return to *A. balsamea* dominance, typically with intermediate stages characterized by mixedwoods (e.g., CNVC00235 [*Abies balsamea – Betula papyrifera / Acer spicatum*]).

Acer spicatum can form dense thickets in canopy openings, sometimes significantly delaying tree regeneration. Its deep roots can survive even high-severity fires and it responds quickly after disturbance by suckering. Being semi-shade tolerant, *A. spicatum* persists as the canopy closes, limiting available light for plants beneath it.

Range: CNVC00225 occurs in the boreal regions of Quebec, New Brunswick and Nova Scotia. In Quebec, it is most common in the northern Appalachian Mountains of the Gaspé region, but it ranges from the Ontario border to the Upper North Shore of the Gulf of Saint Lawrence near Port-Cartier and also occurs on the Magdalen Islands. CNVC00225 is found in the highlands of northern New Brunswick and Cape Breton Island. It 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



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Distribution

Countries: Canada

Provinces / Territories / States: New Brunswick, Nova Scotia, Quebec

Terrestrial Ecozones and Ecoregions of Canada: Atlantic Highlands: Appalachians, New Brunswick Highlands, Northern New Brunswick Uplands; Atlantic Maritime: Cape Breton Highlands, Îles-de-la-Madeleine; Boreal Shield: Abitibi Plains, Central Laurentians, Rivière Rupert Plateau, Southern Laurentians

Rowe's Forest Regions and Sections of Canada: Acadian: Cape Breton Plateau, New Brunswick Uplands, Prince Edward Island, Southern Uplands, Upper Miramichi-Tobique; Boreal: Gaspé, Gouin, Laurentide-Onatchiway, Missinaibi-Cabonga, Northern Clay; Great Lakes-St. Lawrence: Algonquin-Pontiac, Eastern Townships, Laurentian, Middle Ottawa, Saguenay, Temiscouata-Restigouche, Timagami

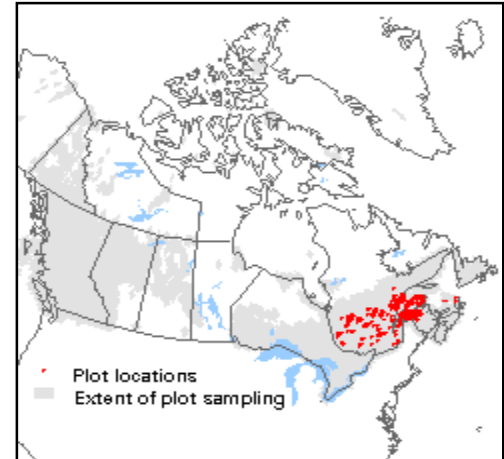
NAAEC CEC Ecoregions of North America (Levels I & II): Eastern Temperate Forests: Mixed Wood Plains; Northern Forests: Atlantic Highlands, Mixed Wood Shield, Softwood Shield

Nature Conservancy of Canada Ecoregions: Boreal Shield, Northern Appalachians-Acadia

Bioclimatic Domains and Subdomains of Québec: 2 Est, 3 Est, 3 Ouest, 4 Est, 4 Ouest, 5 Est, 5 Ouest, 6 Est, 6 Ouest

Ecological Land Classification of New Brunswick (ecoregions): Central Uplands, Highlands, Northern Uplands

Ecological Land Classification of Nova Scotia (ecozones and ecoregions): Atlantic Maritime: Cape Breton Highlands



Corresponding Types and Associations

225a typic	Quebec	QC025A	<i>Abies balsamea</i> / <i>Acer spicatum</i> [Typique]
	Maritimes Region	A179a Typic-u	<i>Abies balsamea</i> - <i>Picea glauca</i> / <i>Ribes lacustre</i> / <i>Rubus pubescens</i> - <i>Streptopus lanceolatus</i> Forest [Typic]
225b <i>Rubus pubescens</i>	Quebec	QC025B	<i>Abies balsamea</i> / <i>Acer spicatum</i> [<i>Rubus pubescens</i>]
	Maritimes Region	A179b Mitella nuda-u	<i>Abies balsamea</i> - <i>Picea glauca</i> / <i>Ribes lacustre</i> / <i>Rubus pubescens</i> - <i>Streptopus lanceolatus</i> Forest [Mitella nuda]



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Vegetation Summary*

Species Name [†]	Association CNVC00225		Subassociation 225a <i>typic</i>		Subassociation 225b <i>Rubus pubescens</i>	
	300 plots		144 plots		156 plots	
	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]
Overstory Trees						
<i>Abies balsamea</i>	41	100	43	99	40	100
<i>Picea glauca</i>	15	81	15	73	16	89
<i>Betula papyrifera</i>	10	79	10	84	10	74
<i>Picea mariana</i>	9	21	8	31	11	12
<i>Thuja occidentalis</i>	7	14	6	7	8	21
Tree Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(49 52 65 77 86)		(49 52 67 83 86)		(49 52 65 72 84)	
Understory Woody Shrubs and Regenerating Trees						
<i>Abies balsamea</i>	20	100	22	99	17	100
<i>Acer spicatum</i>	23	94	21	92	24	97
<i>Betula papyrifera</i>	6	82	6	86	6	78
<i>Picea glauca</i>	6	72	6	65	6	78
<i>Sorbus americana</i>	4	57	4	58	4	55
<i>Corylus cornuta</i>	8	54	9	46	8	61
<i>Rubus idaeus</i>	7	53	7	44	7	62
<i>Ribes lacustre</i>	4	53	3	34	4	70
<i>Lonicera canadensis</i>	4	46	4	39	4	53
<i>Amelanchier</i> sp.	4	43	4	52	5	35
<i>Diervilla lonicera</i>	5	37	5	42	5	32
<i>Viburnum edule</i>	3	32	3	22	3	40
<i>Sorbus decora</i>	3	29	3	30	3	29
<i>Picea mariana</i>	5	28	5	38	5	19
<i>Acer rubrum</i>	5	27	5	31	4	23
<i>Ribes glandulosum</i>	3	26	3	26	4	26
<i>Cornus stolonifera</i>	6	24	3	8	6	39
<i>Sambucus racemosa</i>	3	24	3	19	3	29
<i>Alnus incana</i>	9	22	4	15	11	28
<i>Thuja occidentalis</i>	7	21	5	9	7	33
<i>Prunus pensylvanica</i>	5	20	5	23	4	17
<i>Vaccinium myrtilloides</i>	4	20	4	25	3	15
<i>Ribes triste</i>	3	18	3	4	4	30
<i>Vaccinium angustifolium</i>	3	13	3	22	2	4
Shrub Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(30 30 53 83 99)		(30 30 53 83 99)		(30 30 52 76 99)	



Abies balsamea (Picea glauca) / Acer spicatum / Oxalis montana CNVC00225

Vegetation Summary (cont'd)*

Species Name [†]	Association CNVC00225		Subassociation 225a <i>typic</i>		Subassociation 225b <i>Rubus pubescens</i>	
	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]
Understory Herbs and Dwarf Shrubs						
<i>Aralia nudicaulis</i>	4	87	4	92	4	83
<i>Clintonia borealis</i>	4	87	5	88	3	87
<i>Cornus canadensis</i>	5	84	6	85	4	83
<i>Lysimachia borealis</i>	2	83	2	84	2	81
<i>Oxalis montana</i>	9	81	10	73	9	88
<i>Maianthemum canadense</i>	3	79	3	86	2	72
<i>Coptis trifolia</i>	2	75	2	75	2	75
<i>Linnaea borealis</i>	3	73	3	74	3	72
<i>Rubus pubescens</i>	3	63	2	41	4	83
<i>Gymnocarpium dryopteris</i>	3	63	2	42	3	81
<i>Viola</i> sp.	2	63	2	49	3	75
<i>Streptopus lanceolatus</i>	2	57	2	53	2	60
<i>Dryopteris spinulosa</i> complex	7	52	6	51	7	52
<i>Phegopteris connectilis</i>	3	50	2	34	4	65
<i>Carex</i> sp.	2	44	2	31	2	57
<i>Athyrium filix-femina</i>	4	38	2	18	5	56
<i>Huperzia lucidula</i>	2	36	3	30	2	42
<i>Poaceae</i>	2	36	2	20	2	50
<i>Mitella nuda</i>	2	34	2	6	3	60
<i>Lycopodium annotinum</i>	4	30	4	36	5	24
<i>Dryopteris intermedia</i>	3	30	3	27	2	33
<i>Gaultheria hispidula</i>	2	29	2	33	2	25
<i>Galium triflorum</i>	1	28	1	16	2	40
<i>Solidago macrophylla</i>	3	25	2	24	3	26
<i>Lycopodium obscurum</i>	3	24	4	33	2	16
<i>Circaea alpina</i>	2	24	1	9	3	38
<i>Nabalus</i> sp.	2	24	2	10	2	36
<i>Orthilia secunda</i>	2	24	2	26	1	21
<i>Oclemena acuminata</i>	5	22	4	23	5	22
<i>Solidago</i> sp.	2	22	1	17	2	28
<i>Eurybia macrophylla</i>	3	21	2	19	3	23
<i>Osmunda claytoniana</i>	5	19	2	16	7	21
<i>Galium</i> sp.	2	19	2	6	2	31
<i>Actaea rubra</i>	2	19	1	7	2	29
<i>Moneses uniflora</i>	1	18	1	14	1	21
<i>Pteridium aquilinum</i>	4	17	3	24	5	10
<i>Streptopus amplexifolius</i>	2	17	2	13	2	22
Herb Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(16 30 37 50 70)		(16 16 32 37 50)		(16 33 42 50 70)	



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Vegetation Summary (cont'd)*

Species Name [†]	Association CNVC00225		Subassociation 225a <i>typic</i>		Subassociation 225b <i>Rubus pubescens</i>	
	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]	% Cover [‡]	% Presence [^]
Bryophytes and Lichens						
<i>Pleurozium schreberi</i>	17	93	20	94	13	91
<i>Ptilium crista-castrensis</i>	4	63	4	68	3	58
<i>Hylocomium splendens</i>	11	61	12	65	11	56
<i>Dicranum</i> sp.	4	60	4	64	4	56
<i>Bazzania trilobata</i>	3	34	4	36	3	32
<i>Polytrichum</i> sp.	2	34	2	42	3	26
<i>Mnium</i> sp.	4	32	3	21	4	43
<i>Cladonia</i> sp.	2	31	2	28	2	33
<i>Dicranum scoparium</i>	6	25	6	26	5	25
<i>Sphagnum</i> sp.	7	23	5	28	10	19
<i>Rhytidadelphus triquetrus</i>	3	20	2	8	4	31
<i>Cladina rangiferina</i>	2	18	2	21	2	16
Bryo-Lichen Stratum Cover						
(P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(3 16 36 60 71)		(3 16 40 67 87)		(3 16 32 52 70)	

* 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 CNVC00225 300 plots	Subassociation 225a <i>typic</i> 144 plots	Subassociation 225b <i>Rubus pubescens</i> 156 plots
Elevation Range (min–mean–max meters)	25–331–830 missing data (2)	25–324–830 missing data (1)	40–337–815 missing data (3)
Slope Gradient (% frequency)	very steep (2) steep (13) moderately steep (21) moderate (22) gentle (21) level (21) missing data (1)	very steep (2) steep (17) moderately steep (25) moderate (26) gentle (14) level (16) missing data (0)	very steep (1) steep (10) moderately steep (17) moderate (18) gentle (28) level (25) missing data (1)
Aspect (% frequency)	north (24) east (20) south (17) west (24) level (14) missing data (1)	north (26) east (20) south (15) west (28) level (10) missing data (1)	north (23) east (20) south (18) west (21) level (17) missing data (1)
Meso Toposition (% frequency)	crest / upper (13) mid (43) lower / toe (23) depression (2) level (12) missing data (7)	crest / upper (17) mid (50) lower / toe (22) depression (0) level (8) missing data (3)	crest / upper (9) mid (37) lower / toe (24) depression (4) level (17) missing data (10)
Moisture Regime (% frequency)	dry (2) mesic (63) moist (29) wet (7)	dry (3) mesic (73) moist (22) wet (1)	dry (0) mesic (53) moist (35) wet (12)
Nutrient Regime (% frequency)	poor (2) medium (18) rich (13) missing data (67)	poor (2) medium (17) rich (11) missing data (70)	poor (1) medium (19) rich (15) missing data (65)



Abies balsamea (Picea glauca) / Acer spicatum / Oxalis montana CNVC00225

Site / Soil Characteristics (cont'd)

	Association CNVC00225	Subassociation 225a <i>typic</i>	Subassociation 225b <i>Rubus pubescens</i>
Soil Parent Material (% frequency)	colluvium (12) moraine / till (65) fluvial (2) glaciofluvial (7) glaciolacustrine (3) marine (4) organic (2) missing data (4)	colluvium (11) moraine / till (69) fluvial (0) glaciofluvial (8) glaciolacustrine (1) marine (4) organic (1) missing data (6)	colluvium (13) moraine / till (61) fluvial (4) glaciofluvial (5) glaciolacustrine (6) marine (4) organic (4) missing data (3)
Soil Rooting Zone Substrate (% frequency)	non-soil (12) sandy (3) coarse loamy (17) fine loamy (7) silty (1) clayey (1) organic (3) missing data (56)	non-soil (11) sandy (5) coarse loamy (18) fine loamy (3) silty (1) clayey (1) organic (1) missing data (60)	non-soil (13) sandy (1) coarse loamy (15) fine loamy (11) silty (1) clayey (1) organic (4) missing data (53)
Root Restricting Depth (% frequency)	0 – 20 cm (2) 21 – 99 cm (42) ≥ 100 cm (30) missing data (26)	0 – 20 cm (4) 21 – 99 cm (43) ≥ 100 cm (26) missing data (26)	0 – 20 cm (1) 21 – 99 cm (42) ≥ 100 cm (33) missing data (25)
Humus Form (% frequency)	mor (56) moder (7) mull (1) peatymor (5) missing data (31)	mor (63) moder (7) mull (0) peatymor (1) missing data (29)	mor (50) moder (7) mull (2) peatymor (8) 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:

CNVC00220 [*Abies balsamea (Picea mariana) / Oxalis montana / Pleurozium schreberi*] occurs in New Brunswick and Nova Scotia on boreal sites that are not as moist or rich. It has *Picea mariana*, rather than *P. glauca*, in the tree and shrub layers and less *Acer spicatum*.

CNVC00222 [*Abies balsamea / Pleurozium schreberi*] occurs on sites that are not as moist or rich in the same range and has less *Acer spicatum* in the shrub layer, lower constancy and cover of more nutrient-demanding herb layer species and more feathermosses.

CNVC00256 [*Picea glauca – Abies balsamea / Streptopus lanceolatus / Pleurozium schreberi*] occurs in Ontario and southeastern Manitoba on comparable boreal sites. It has less *Abies balsamea* and *Betula papyrifera* in the tree and shrub layers and lower abundance of ferns (e.g., *Gymnocarpium dryopteris*, *Dryopteris* spp., *Phegopteris connectilis*) and usually less *Oxalis montana* in the herb layer.

CNVC00278 [*Abies balsamea / Pleurozium schreberi – Sphagnum* spp.] occurs on moister sites in Quebec, lacks a tall shrub layer of *Acer spicatum* and has significant *Sphagnum* moss cover.

CNVC00297 [*Abies balsamea / Alnus incana*] occurs in Quebec on moister, richer sites and has a tall shrub layer with abundant *Alnus incana* rather than *Acer spicatum*.

CNVC00348 [*Abies balsamea / Taxus canadensis / Rubus pubescens / Dicranum majus*] occurs on comparable boreal sites on insular Newfoundland but has less *Picea glauca* and *Acer spicatum*, more *Taxus canadensis* and *Dryopteris* spp., and no *Oxalis montana*.

Related United States National Vegetation Classification Associations:

Relationships with Other Classifications:

Nova Scotia plots in CNVC00225 are classified as HL1 [Balsam fir / Mountain-ash / Large-leaved goldenrod] in Neily et al. 2011.

Comments

CNVC00225 can have slightly different stand dynamics than other *Abies balsamea* Associations in the same range (i.e., CNVC00222 [*Abies balsamea / Pleurozium schreberi*] and CNVC00220 [*Abies balsamea (Picea mariana) / Oxalis montana / Pleurozium schreberi*]). The well-developed shrub and herb layers of CNVC00225 are capable of delaying the release of tree seedlings in response to canopy gaps.



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Source Information

Number of source plots for CNVC00225: 300

Number of source plots for 225a typic: 144

Number of source plots for 225b *Rubus pubescens*: 156

Information Sources:

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Concept Authors: K. Baldwin, S. Basquill, K. Chapman, M. Major, C. Morneau

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***Abies balsamea (Picea glauca) / Acer spicatum / Oxalis montana* CNVC00225**

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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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