**Forest / Forêt** **Association CNVC00239**

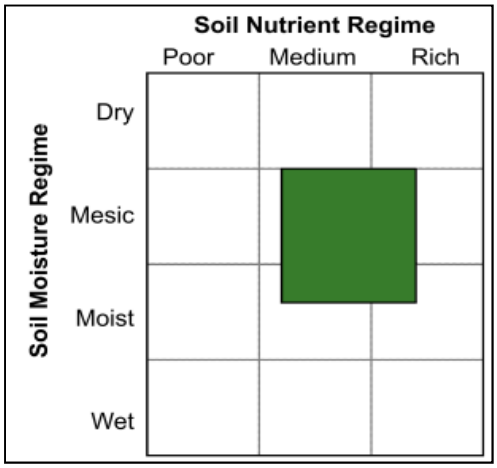
# *Betula papyrifera (Populus tremuloides) / Acer spicatum / Clintonia borealis*

**Paper Birch (Trembling Aspen) / Mountain Maple / Yellow Clintonia**

**Bouleau à papier (Peuplier faux-tremble) / Érable à épis / Clintonie boréale**

**Subassociations:** none
**CNVC Alliance:** CA00015 *Betula papyrifera – Populus tremuloides – Abies balsamea / Acer spicatum*
**CNVC Group:** CG0007 Ontario-Quebec Boreal Mesic Paper Birch – Balsam Fir – Trembling Aspen Forest

Source: Natural Resources Canada - Canadian Forest Service




## Type Description

**Concept:** CNVC00239 is a boreal hardwood forest Association that ranges from Manitoba to Quebec. It has a closed canopy dominated by paper birch (*Betula papyrifera*) and/or trembling aspen (*Populus tremuloides*). The dense tall shrub layer is usually dominated by mountain maple (*Acer spicatum*) and/or beaked hazelnut (*Corylus cornuta)* and has abundant balsam fir regeneration. Paper birch saplings and northern bush-honeysuckle (*Diervilla lonicera*) are also common in the shrub layer. The well-developed herb layer typically includes yellow clintonia (*Clintonia borealis*), wild lily-of-the valley (*Maianthemum canadense*), bunchberry (*Cornus canadensis*), wild sarsaparilla (*Aralia nudicaulis*), northern starflower (*Lysimachia borealis*) and wood ferns (*Dryopteris* spp.). 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*). CNVC00239 occurs in a region with a boreal climate that grades from subhumid continental in the western portion of its range to very humid and more maritime in the east. It is most frequently found on mesic, nutrient-medium to rich sites. It is an early seral condition that typically establishes after fire or harvesting.

**Vegetation:** CNVC00239 is a hardwood forest Association with a closed canopy dominated by *Betula papyrifera* and/or *Populus tremuloides,* often with *Abies balsamea* as a minor component. A dense layer of tall broad-leaved shrubs dominated by *Acer spicatum* and/or *Corylus cornuta,* with abundant regenerating *A. balsamea,* helps to characterize this Association. *B. papyrifera* saplings and the low shrub *Diervilla lonicera* are usually present in the shrub layer. The herb layer is well developed and commonly includes *Clintonia borealis*, *Maianthemum canadense*, *Cornus canadensis, Aralia nudicaulis*, *Lysimachia borealis* and *Dryopteris* spp. 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.

**Environment:** CNVC00239 occurs in a boreal climate that is subhumid continental in the western part of its range, becoming increasingly humid and more maritime farther east. Regional fire cycles within the range are intermediate (100-270 years), long (270-500 years) or even very long (>500 years). It is found most frequently on mesic, nutrient-medium to rich sites; these are some of the most productive sites in this region of the boreal. Stands are often on gentle to moderately steep slopes on middle-slope or, less frequently, upper-slope topopositions. Seepage often enhances moisture and nutrient availability on these sites. Soils are usually moderately deep to deep, well drained and coarse textured and typically derived from morainal parent materials. Mor humus forms are common but compared to other boreal Associations, moders are relatively frequent.

# *Betula papyrifera (Populus tremuloides)* / *Acer spicatum* / *Clintonia borealis* CNVC00239

## Type Description (cont'd)

**Dynamics:** CNVC00239 is an early seral condition that typically establishes after stand-replacing fire or harvesting. *Betula papyrifera* and *Populus tremuloides* are pioneer species adapted to disturbance. Following any disturbance that does not kill their roots, they can reproduce vegetatively, *B. papyrifera* from stump sprouts and *P. tremuloides* from root suckers. These species also produce abundant, light, wind-dispersed seeds that can readily colonize mineral soil seedbeds exposed by disturbance. Both species grow rapidly in full-light conditions but are intolerant of shade so do not replace themselves in a stand without further disturbance. If seed sources are available, shade tolerant conifers (especially *Abies balsamea*) can become established in these stands and may grow into the canopy as the pioneer hardwood species decline. Over time, a mid-seral mixedwood Association could develop (e.g., CNVC00235 [*Abies balsamea – Betula papyrifera* / *Acer spicatum*]).

Occasionally, CNVC00239 can result when harvesting or a severe outbreak of spruce budworm (*Choristoneura fumiferana*) eliminates the mature conifers in a mixedwood Association (e.g., CNVC00235). The resulting stand of CNVC00239 is short lived, however, since the surviving *A. balsamea* in the understory quickly grow into the canopy, re-establishing the mixedwood condition.

*Acer spicatum* and *Corylus cornuta* can form dense thickets in canopy openings, sometimes significantly delaying conifer ingress. Their deep roots can survive even high-severity fires and they respond quickly after disturbance by suckering. Being semi-shade tolerant, these tall shrubs persist as the canopy closes, limiting available light for plants beneath them.

Forest tent caterpillar (*Malacosoma disstria*) and *Armillaria* root disease (*Armillaria* spp.) can have significant impacts on *P. tremuloides.* Defoliation by the caterpillar can reduce growth, cause dieback and sometimes lead to mortality. *Armillaria* spp. can weaken or kill individual or small groups of trees. Canopy openings that result from insect or pathogen disturbance can promote forest succession by enhancing the growth of understory trees, such as *A. balsamea* and *P. mariana*.

**Range:** CNVC00239 occurs in the boreal region of Quebec and Ontario and likely extends into southeastern Manitoba as far west as Lake Winnipeg. In Quebec it ranges east to the Lower North Shore of the Gulf of Saint Lawrence near the Little Mecatina River and occurs in the Gaspé region and on Anticosti Island. CNVC00239 occurs sporadically in the northern temperate region, usually on sites that are cooler than normal for that region.

## Conservation Status (NatureServe)

**Global Conservation Rank:** no applicable rank
**National Conservation Rank:** not yet determined
**Subnational Conservation Rank:** not yet determined

**Forest / Forêt** **Association CNVC00239**

# *Betula papyrifera (Populus tremuloides) / Acer spicatum / Clintonia borealis*

**Paper Birch (Trembling Aspen) / Mountain Maple / Yellow Clintonia**

**Bouleau à papier (Peuplier faux-tremble) / Érable à épis / Clintonie boréale**

## Distribution

**Countries:** Canada

**Provinces / Territories / States:** Manitoba, Ontario, Quebec

**Terrestrial Ecozones and Ecoregions of Canada:** Atlantic Highlands: Appalachians, Northern New Brunswick Uplands; Boreal Shield: Abitibi Plains, Algonquin-Lake Nipissing, Anticosti Island, Central Laurentians, Lac Seul Upland, Lake Nipigon, Lake of the Woods, Lake Timiskaming Lowland, Mecatina Plateau, Rivière Rupert Plateau, Southern Laurentians, Thunder Bay-Quetico

**Rowe's Forest Regions and Sections of Canada:** Boreal: Anticosti, Central Plateau, Chibougamau-Natashquan, Gaspé, Gouin, Laurentide-Onatchiway, Lower English River, Missinaibi-Cabonga, Northern Clay, Superior, Upper English River; Great Lakes-St. Lawrence: Algoma, Algonquin-Pontiac, Haileybury Clay, Laurentian, Middle Ottawa, Quetico, Saguenay, Sudbury-North Bay, 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

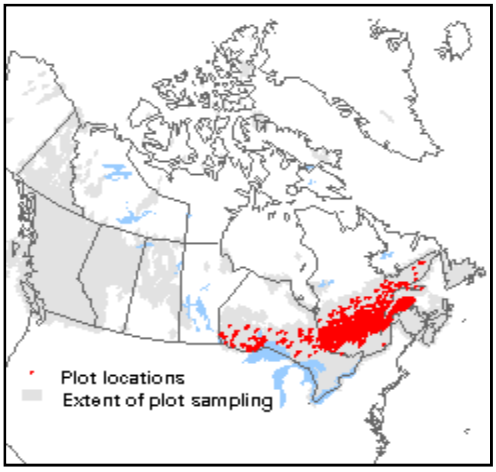
**Nature Conservancy of Canada Ecoregions:** Boreal Shield, Great Lakes, Northern Appalachians-Acadia, Superior-Lake of the Woods

**Ecozones and Ecoregions of Manitoba:** Boreal Shield

**Manitoba Protected Areas Initiative Natural Regions:** Manitoba Lowlands: Lake of the Woods; Precambrian Boreal Forest: Lac Seul Upland

**Ecological Land Classification of Ontario (ecoregions and ecodistricts):** 3E-1, 3E-2, 3E-4, 3E-5, 3E-6, 3E-7, 3S-1, 3S-2, 3S-3, 3S-4, 3S-5, 3W-1, 3W-2, 3W-3, 3W-4, 3W-5, 4E-3, 4E-4, 4S-1, 4S-2, 4S-3, 4S-4, 4S-5, 4S-6, 4W-1, 4W-2, 5E-6, 5E-10, 5E-13

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




## Corresponding Types and Associations

| | | | |
|---|---|---|---|
| **CNVC00239** | Ontario | BTr8-1 | Populus tremuloides - Betula papyrifera / Acer spicatum / Clintonia borealis |
| | Quebec | QC103A | Betula papyrifera / Acer spicatum [Typique] |
| | | QC103B | Betula papyrifera / Acer spicatum [Diervilla lonicera] |
| | | QC103C | Betula papyrifera / Acer spicatum [Rubus pubescens] |
| | | QC111A | Populus tremuloides (Betula papyrifera) / Acer spicatum [Typique] |
| | | QC111B | Populus tremuloides (Betula papyrifera) / Acer spicatum [Diervilla lonicera] |
| | | QC111C | Populus tremuloides (Betula papyrifera) / Acer spicatum [Alnus viridis] |

**Forest / Forêt** **Association CNVC00239**

## *Betula papyrifera (Populus tremuloides) / Acer spicatum / Clintonia borealis*

**Paper Birch (Trembling Aspen) / Mountain Maple / Yellow Clintonia**

**Bouleau à papier (Peuplier faux-tremble) / Érable à épis / Clintonie boréale**

## Vegetation Summary*

| | Association CNVC00239 | |
|---|---|---|
| | **1478 plots** | |
| **Species Name†** | % Cover± | % Presence^ |
| **Overstory Trees** | | |
| ***Betula papyrifera*** | **41** | **94** |
| *Abies balsamea* | 10 | 68 |
| ***Populus tremuloides*** | **37** | **53** |
| *Picea mariana* | 8 | 44 |
| *Picea glauca* | 6 | 42 |
| *Prunus pensylvanica* | 8 | 37 |
| *Sorbus americana* | 5 | 21 |
| **Tree Stratum Cover ($P_{10}$ $P_{25}$ Mean $P_{75}$ $P_{90}$)‡** | **(49 60 74 93 99)** | |
| **Understory Woody Shrubs and Regenerating Trees** | | |
| *Abies balsamea* | 14 | 89 |
| *Betula papyrifera* | 5 | 77 |
| ***Acer spicatum*** | **31** | **76** |
| *Diervilla lonicera* | 12 | 62 |
| *Amelanchier sp.* | 5 | 59 |
| *Picea mariana* | 6 | 52 |
| *Sorbus americana* | 5 | 52 |
| *Corylus cornuta* | 17 | 46 |
| *Vaccinium myrtilloides* | 4 | 44 |
| *Picea glauca* | 4 | 44 |
| *Ribes glandulosum* | 3 | 44 |
| *Prunus pensylvanica* | 4 | 40 |
| *Vaccinium angustifolium* | 3 | 40 |
| *Viburnum nudum* | 6 | 39 |
| *Populus tremuloides* | 4 | 39 |
| *Rubus idaeus* | 6 | 36 |
| *Salix* sp. | 3 | 26 |
| *Lonicera canadensis* | 3 | 26 |
| *Sambucus racemosa* | 3 | 26 |
| *Sorbus decora* | 4 | 25 |
| *Ilex mucronata* | 4 | 21 |
| *Viburnum edule* | 4 | 21 |
| **Shrub Stratum Cover ($P_{10}$ $P_{25}$ Mean $P_{75}$ $P_{90}$)‡** | **(32 49 67 90 99)** | |
| **Understory Herbs and Dwarf Shrubs** | | |
| ***Clintonia borealis*** | **7** | **90** |
| *Maianthemum canadense* | 5 | 86 |
| *Cornus canadensis* | 9 | 82 |
| *Aralia nudicaulis* | 7 | 81 |
| *Lysimachia borealis* | 3 | 81 |

# *Betula papyrifera (Populus tremuloides) / Acer spicatum / Clintonia borealis* CNVC00239

## Vegetation Summary (cont'd)*

| Species Name† | Association CNVC00239 % Cover± | % Presence^ |
|---|---|---|
| *Dryopteris spinulosa complex* | 6 | 65 |
| *Coptis trifolia* | 3 | 56 |
| *Lycopodium obscurum* | 3 | 55 |
| *Linnaea borealis* | 3 | 52 |
| *Viola* sp. | 3 | 45 |
| *Streptopus lanceolatus* | 2 | 44 |
| *Eurybia macrophylla* | 11 | 43 |
| *Oxalis montana* | 9 | 40 |
| *Pteridium aquilinum* | 13 | 39 |
| *Lycopodium annotinum* | 5 | 38 |
| *Carex* sp. | 3 | 34 |
| *Gymnocarpium dryopteris* | 3 | 32 |
| *Rubus pubescens* | 4 | 31 |
| *Gaultheria hispidula* | 3 | 29 |
| *Poaceae* | 4 | 28 |
| *Solidago macrophylla* | 3 | 28 |
| *Oclemena acuminata* | 5 | 27 |
| *Huperzia lucidula* | 3 | 22 |
| *Athyrium filix-femina* | 4 | 21 |
| *Phegopteris connectilis* | 3 | 21 |
| **Herb Stratum Cover ($P_{10}$ $P_{25}$ Mean $P_{75}$ $P_{90}$)‡** | **(16 33 44 70 70)** | |
| **Bryophytes and Lichens** | | |
| *Pleurozium schreberi* | 6 | 88 |
| *Dicranum* sp. | 4 | 79 |
| *Polytrichum* sp. | 3 | 57 |
| *Cladonia* sp. | 2 | 47 |
| *Ptilium crista-castrensis* | 2 | 42 |
| *Cladina rangiferina* | 2 | 35 |
| *Hylocomium splendens* | 4 | 28 |
| **Bryo-Lichen Stratum Cover ($P_{10}$ $P_{25}$ Mean $P_{75}$ $P_{90}$)‡** | **(3 3 12 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

‡ $P_x = X^{th}$ percentile (e.g., $P_{10} = 10^{th}$ percentile)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**Paper Birch (Trembling Aspen) / Mountain Maple / Yellow Clintonia**
**Bouleau à papier (Peuplier faux-tremble) / Érable à épis / Clintonie boréale**

## Site / Soil Characteristics

| | Association CNVC00239 |
|---|---|
| | **1478 plots** |
| **Elevation Range (min–mean–max meters)** | |
| | 20–400–930 |
| | missing data (1) |
| **Slope Gradient (% frequency)** | |
| | very steep (1) |
| | steep (10) |
| | moderately steep (23) |
| | moderate (26) |
| | **gentle (26)** |
| | level (15) |
| | missing data (1) |
| **Aspect (% frequency)** | |
| | north (23) |
| | **east (26)** |
| | south (19) |
| | west (21) |
| | level (10) |
| | missing data (0) |
| **Meso Topoposition (% frequency)** | |
| | crest / upper (21) |
| | **mid (61)** |
| | lower / toe (9) |
| | depression (2) |
| | level (8) |
| | missing data (0) |
| **Moisture Regime (% frequency)** | |
| | very dry (0) |
| | dry (3) |
| | **mesic (82)** |
| | moist (14) |
| | wet (1) |
| | missing data (0) |
| **Nutrient Regime (% frequency)** | |
| | missing data (100) |

# *Betula papyrifera (Populus tremuloides) / Acer spicatum / Clintonia borealis* CNVC00239

## Site / Soil Characteristics (cont'd)

| | Association CNVC00239 |
|---|---|
| **Soil Parent Material (% frequency)** | |
| | bedrock (0) |
| | colluvium (4) |
| | eolian (0) |
| | **moraine / till (74)** |
| | fluvial (1) |
| | glaciofluvial (10) |
| | lacustrine (1) |
| | glaciolacustrine (7) |
| | marine (2) |
| | glaciomarine (0) |
| | organic (0) |
| | missing data (1) |
| **Soil Rooting Zone Substrate (% frequency)** | |
| | non-soil (4) |
| | sandy (7) |
| | coarse loamy (18) |
| | fine loamy (4) |
| | silty (3) |
| | clayey (2) |
| | organic (1) |
| | missing data (62) |
| **Root Restricting Depth (% frequency)** | |
| | 0 – 20 cm (3) |
| | **21 – 99 cm (62)** |
| | ≥ 100 cm (5) |
| | missing data (30) |
| **Humus Form (% frequency)** | |
| | **mor (78)** |
| | moder (18) |
| | mull (2) |
| | peatymor (1) |
| | missing data (1) |

**Forest / Forêt** **Association CNVC00239**

## *Betula papyrifera (Populus tremuloides) / Acer spicatum / Clintonia borealis*

**Paper Birch (Trembling Aspen) / Mountain Maple / Yellow Clintonia**
**Bouleau à papier (Peuplier faux-tremble) / Érable à épis / Clintonie boréale**

## Additional Characteristics

**Species of High Conservation Concern:**

**Non-native Species:**

**Management Issues:**

## Type Statistics

**Internal Similarity:** **Confidence:**
**Strength:**

## Related Concepts

**Similar CNVC Associations:**

CNVC00215 [*Betula papyrifera – Populus tremuloides – Pinus banksiana / Acer spicatum / Clintonia borealis*] is a similar mixedwood Association that occurs on comparable sites in the same range.

CNVC00235 [*Abies balsamea – Betula papyrifera / Acer spicatum*] is a similar mixedwood Association that occurs on comparable sites in the same range (see Dynamics).

CNVC00237 [*Betula papyrifera / Vaccinium angustifolium – Kalmia angustifolia / Pleurozium schreberi*] occurs on poorer sites in the same range and has less *Populus tremuloides* and more ericaceous shrubs.

CNVC00238 [*Populus tremuloides (Betula papyrifera) / Diervilla lonicera*] occurs on slightly poorer sites in the same range and has less *Acer spicatum* and *Corylus cornuta*.

CNVC00241 [*Populus tremuloides (P. balsamifera) / Alnus incana / Eurybia macrophylla]* occurs on moister, richer sites in the same range and has abundant *Alnus incana* in the shrub layer.

CNVC00242 [*Betula papyrifera / Alnus incana*] occurs in Quebec on moister, richer sites and has abundant *Alnus incana* in the shrub layer.

CNVC00305 [*Populus tremuloides / Alnus viridis (Rosa acicularis)*] occurs in northwestern Ontario and eastern Manitoba on comparable boreal sites. It has less *Betula papyrifera* and *Abies balsamea* in the tree and shrub layers, more *Viburnum edule, Rosa acicularis* and *Rhododendron groenlandicum* in the shrub layer and less *Dryopteris* spp. in the herb layer.

CNVC00333 [*Populus tremuloides – P. balsamifera / Alnus incana – Cornus stolonifera*] occurs in northwestern Ontario and eastern Manitoba on moister, richer sites. It has more *Populus balsamifera* in the canopy, less *Betula papyrifera* and *Abies balsamea* in the tree and shrub layers and more *Alnus* spp. and *Cornus stolonifera* in the shrub layer.

**Related United States National Vegetation Classification Associations:**

**Relationships with Other Classifications:**

## Comments

West of the range of CNVC00239, on the boreal plains of Manitoba and Saskatchewan, *Populus tremuloides* plays a greater role relative to *Betula papyrifera* and CNVC00306 [*Populus tremuloides – Betula papyrifera / Acer spicatum (Rosa acicularis*)] is a similar condition.

# *Betula papyrifera (Populus tremuloides) / Acer spicatum / Clintonia borealis* CNVC00239

## Source Information

**Number of source plots for CNVC00239**: 1478

**Information Sources:**

McMurray, S.C., Johnson, J.A., Zhou, K., Uhlig, P.W.C. 2015. Ontario ecological land classification program - Ecological Data Repository (EDR). Ont. Min. Nat. Resour. & For., Sci.& Info. Branch, Sault Ste. Marie, ON.

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, M. Major, C. Morneau, P. Uhlig, M. Wester

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

**Date of Concept:** May, 2013

**Date of Description:** March, 2016

**Classification References:**

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.

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# *Betula papyrifera (Populus tremuloides) / Acer spicatum / Clintonia borealis* CNVC00239

**Characterization References (cont'd):**

Howard, J.L. 1996. Populus tremuloides. 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/poptre/all.html (accessed: May 27, 2015).

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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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