



Forest / Forêt

Association CNVC00009

Tsuga heterophylla* - *Pseudotsuga menziesii* - *Abies amabilis* / *Hylocomium splendens

Western Hemlock - Douglas-fir - Pacific Silver Fir / Stairstep Moss

Pruche de l'Ouest - Douglas de Menzies - Sapin gracieux / Hypne éclatante

Subassociations: none

CNVC Alliance: not yet determined

CNVC Group: not yet determined

Type Description

Concept: CNVC00009 is a mesic, Pacific Coast coniferous association that is endemic to higher elevations in drainages of the climatically transitional (maritime / continental) eastern side of the Coast Mountains of British Columbia. It occurs on a variety of topographic positions, with mainly moderate slope gradients. These mature to old-growth forests are dominated by western hemlock (*Tsuga heterophylla*) with Douglas-fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), and/or Pacific silver fir (*Abies amabilis*) often present. The shrub layer is relatively sparse, with regenerating western hemlock and Pacific silver fir typically most abundant along with various combinations of blueberries (*Vaccinium* spp.). The herb layer is also sparse, generally with scattered cover of species such as oneside wintergreen (*Orthilia secunda*), twinflower (*Linnaea borealis*), giant rattlesnake-plantain (*Goodyera oblongifolia*), singleflower clintonia (*Clintonia uniflora*), or bunchberry (*Cornus canadensis*). Stairstep moss (*Hylocomium splendens*), pipecleaner moss (*Rhytidiopsis robusta*) and lanky moss (*Rhytidiadelphus loreus*) are the leading species in the well-developed moss layer.

Vegetation: CNVC00009 is characterized by *Tsuga heterophylla* dominance in the canopy, often with *Pseudotsuga menziesii*, *Thuja plicata*, and *Abies amabilis*. Dry summer weather has contributed to a history of extensive wildfires in the southern part of the range, resulting in widespread distribution of *Pseudotsuga menziesii*. The shrub layer is relatively sparse, with regenerating *Tsuga heterophylla* and *Abies amabilis* typically most abundant. *Vaccinium parvifolium*, *V. alaskaense*, *V. ovalifolium*, *V. membranaceum* and *Menziesia ferruginea* are also common, but not always present. The herb layer is sparse, generally with scattered cover of species such as *Orthilia secunda*, *Linnaea borealis*, *Goodyera oblongifolia*, *Clintonia uniflora*, and *Cornus canadensis*. *Hylocomium splendens*, *Rhytidiopsis robusta*, and *Rhytidiadelphus loreus* are the main species in the well-developed moss layer, often with *Pleurozium schreberi*.



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Type Description (cont'd)

Environment: CNVC00009 occurs on mesic sites in moist, subarctic climates on the east side (lee) of the coastal mountains of British Columbia. Rainshadow effects of mountain ranges to the west contribute to summer-dry conditions which lead to moderately high wildfire hazard. In southern portions of the range, it is found at elevations from approximately 650 to 1200 mASL in the westerly drainages experiencing some maritime influence; in drainages farther to the east which experience less maritime influence, elevations range between approximately 900 to 1350 m. In northern and central portions of its range, this association occurs at lower elevations - typically from sea level to 700 m. Topographic positions are variable. Soils are developed on morainal, fluvial and colluvial materials, with textures ranging from fine loamy to sandy. Well- to moderately well-drained, mesic, and nutrient-poor to medium soils are normal for sites supporting this association. Humus forms are usually mors, which are commonly 5-10 cm thick.

Dynamics: An intensive logging history means that few of the once extensive old-forest successional stages remain. Under natural conditions, when wind exposure is indirect, stand replacement may be gradual through the mortality of individual or small numbers of canopy trees. Unless windthrow and fire have been pervasive, the age composition of these potentially old-forest stages tends to be uneven. Stand-replacing fires can occur in dry summer weather. *Armillaria* root disease (*Armillaria ostoyae*) is a high risk for *Abies amabilis* and a medium risk for *Pseudotsuga menziesii* and *Tsuga heterophylla*. *Annosus* root disease (*Heterobasidion annosum*) is a medium risk for *Abies amabilis*.

Range: CNVC00009 is a Canadian endemic association. It is found in British Columbia in higher elevation drainages of the Fraser River, both east and north from Chilliwack in the lower Fraser Valley, and in drainages on the eastern side of the Coast Mountains from valleys adjacent to the northern half of Harrison Lake northwestward as far as the lower Kimsquit River valley near the headwaters of Dean Channel, approximately 75 km north of Bella Coola.

Conservation Status (NatureServe)

Global Conservation Rank: G2G3

National Conservation Rank: not yet determined

Subnational Conservation Rank: S2S3 (BC)



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Distribution

Countries: Canada

Provinces / Territories / States: British Columbia

Ecozones and Ecoregions of Canada: Pacific Maritime: Coastal Gap, Pacific Ranges; Montane Cordillera: Interior Transition Ranges

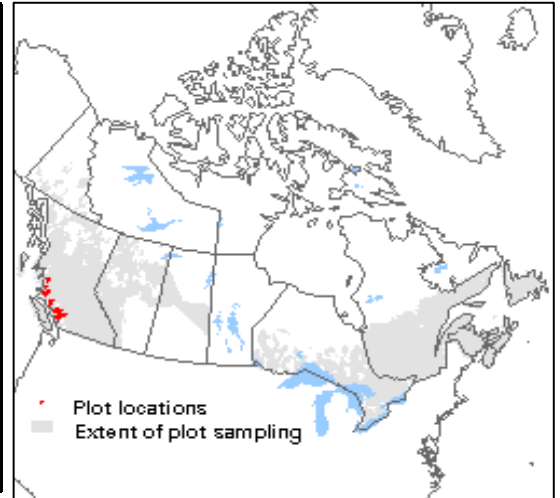
Rowe's Forest Regions and Sections: Coast: Southern Pacific Coast

Commission for Environmental Cooperation Ecological Regions of North America: Marine West Coast Forests

The Nature Conservancy (USA) and Nature Conservancy of Canada Ecoregions: North Cascades, S.E. Alaska - B.C. Coastal Forest and Mountains

Biogeoclimatic Ecosystem Classification of British Columbia (zones and subzones): CWH ms

Ecoregion Classification System of British Columbia (ecosections): Central Pacific Ranges, Eastern Pacific Ranges, Leeward Pacific Ranges, Kimsquit Mountains, Northern Pacific Ranges



Corresponding Types and Associations

CNVC00009	British Columbia	CWH ms 1 /01	<i>Abies amabilis</i> - <i>Pseudotsuga menziesii</i>
		CWH ms 1 /012	<i>Abies amabilis</i> - <i>Pseudotsuga menziesii</i>
		CWH ms 2 /01	<i>Abies amabilis</i> - <i>Pseudotsuga menziesii</i>



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Vegetation Summary*

Species Name†	Association CNVC00009 87 plots	
	% Cover	% Presence
Overstory Trees		
<i>Tsuga heterophylla</i>	41	97
<i>Pseudotsuga menziesii</i>	23	69
<i>Thuja plicata</i>	13	69
<i>Abies amabilis</i>	17	64
Tree Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(40 55 65 78 85)	
Understory Woody Shrubs and Regenerating Trees		
<i>Tsuga heterophylla</i>	13	67
<i>Abies amabilis</i>	14	66
<i>Vaccinium parvifolium</i>	5	64
<i>Vaccinium alaskaense</i>	20	59
<i>Vaccinium ovalifolium</i>	9	57
<i>Menziesia ferruginea</i>	5	55
<i>Vaccinium membranaceum</i>	7	48
<i>Paxistima myrsinites</i>	3	40
<i>Thuja plicata</i>	7	32
Shrub Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(5 16 47 75 90)	
Understory Herbs and Dwarf Shrubs		
<i>Cornus canadensis</i>	5	76
<i>Orthilia secunda</i>	2	74
<i>Clintonia uniflora</i>	7	69
<i>Goodyera oblongifolia</i>	1	64
<i>Linnaea borealis</i>	5	52
<i>Chimaphila umbellata</i>	2	43
<i>Chimaphila menziesii</i>	1	43
<i>Rubus pedatus</i>	7	37
<i>Tiarella trifoliata</i> var. <i>unifoliata</i>	1	28
<i>Lycopodium clavatum</i>	1	25
<i>Listera cordata</i>	1	24
<i>Corallorhiza maculata</i>	1	24
<i>Pyrola asarifolia</i>	1	23
<i>Pteridium aquilinum</i>	1	22
<i>Gymnocarpium dryopteris</i>	1	21
Herb Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(3 5 17 20 45)	
Bryophytes and Lichens		
<i>Rhytidiopsis robusta</i>	22	83



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Vegetation Summary (cont'd)*

Species Name [†]	Association CNVC00009	
	% Cover	% Presence
<i>Hylocomium splendens</i>	30	80
<i>Rhytidiadelphus loreus</i>	14	70
<i>Pleurozium schreberi</i>	16	49
<i>Dicranum fuscescens</i>	4	40
<i>Rhytidiadelphus triquetrus</i>	4	30
<i>Plagiothecium undulatum</i>	1	25
<i>Eurhynchium oreganum</i>	4	21
Bryo-Lichen Stratum Cover		
(P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(26 52 68 90 95)	

* 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

[‡] P_x = Xth percentile (e.g., P₁₀ = 10th percentile)



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Site / Soil Characteristics

Association
CNVC00009
87 plots

Elevation Range (min–mean–max meters)

60–589–1253
missing data (2)

Slope Gradient (% frequency)

very steep (11)
steep (26)
moderately steep (20)
moderate (18)
gentle (2)
level (21)
missing data (1)

Aspect (% frequency)

north (17)
east (20)
south (20)
west (28)
level (15)
missing data (1)

Meso Toposition (% frequency)

crest / upper (15)
mid (46)
lower / toe (6)
level (13)
missing data (21)

Moisture Regime (% frequency)

mesic (100)

Nutrient Regime (% frequency)

poor (56)
medium (44)



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Site / Soil Characteristics (cont'd)

Association
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Soil Parent Material (% frequency)

colluvium (17)
moraine / till (16)
fluvial (17)
glaciofluvial (3)
organic (1)
missing data (45)

Soil Rooting Zone Substrate (% frequency)

non-soil (17)
sandy (33)
coarse loamy (38)
fine loamy (5)
silty (2)
organic (1)
missing data (3)

Root Restricting Depth (% frequency)

0 – 20 cm (1)
21 – 99 cm (33)
≥ 100 cm (3)
missing data (62)

Humus Form (% frequency)

mor (92)
moder (3)
peatymor (2)
missing data (2)



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Additional Characteristics

Species of High Conservation Concern:

Non-native Species:

Management Issues:

Type Statistics

Internal Similarity:

Confidence: high

Strength:

Related Concepts

Similar CNVC Associations: CNVC00030 *Pseudotsuga menziesii* - *Tsuga heterophylla* (*Thuja plicata*) / *Paxistima myrsinites* - *Vaccinium membranaceum* / *Rhytidopsis robusta*; CNVC00035 *Tsuga heterophylla* - *Abies amabilis* / *Vaccinium alaskaense* / *Rubus pedatus* / *Rhytidopsis robusta*

Related United States National Vegetation Classification Associations: C EGL002833 *Tsuga heterophylla* - *Abies amabilis* - (*Pseudotsuga menziesii*) / *Hylocomium splendens* Forest; C EGL002836 *Tsuga heterophylla* - *Pseudotsuga menziesii* - *Abies amabilis* / *Paxistima myrsinites* Forest

Relationships with Other Classifications:

Comments

This is the mesic or zonal association in this climate. CNVC00030 [*Pseudotsuga menziesii* - *Tsuga heterophylla* (*Thuja plicata*) / *Paxistima myrsinites* - *Vaccinium membranaceum* / *Rhytidopsis robusta*] is found on slightly drier sites and is less diverse in the understory, lacking *Vaccinium* spp. and *Rhytidadelphus loreus*, but greater cover and presence of *Paxistima myrsinites* and *Chimaphilla umbellata*. CNVC00035 [*Tsuga heterophylla* - *Abies amabilis* / *Vaccinium alaskaense* / *Rubus pedatus* / *Rhytidopsis robusta*] occurs on slightly moister sites within the range of CNVC00009. It does not have *Pseudotsuga menziesii* as a major canopy component.

Source Information

Number of source plots for CNVC00009: 87

Information Sources: British Columbia Ministry of Forests and Range, Research Branch BECMaster database, October 2007 (87 plots)

Concept Authors: K. Klinka, J. Pojar, D. Meidinger, C. Chappell, C. Cadrin, G. Kittel, C. McCain, K. Boggs, J. Kagan, G. Cushon, A. Banner and T. DeMeo

Description Authors: D. Meidinger, A. Inselberg, C. Cadrin and K. Baldwin

Date of Concept: 1991, 2005

Date of Description: March, 2011



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Source Information (cont'd)

Classification References:

British Columbia Ministry of Forests and Range, Research Branch. 2007. Vegetation classification hierarchy: BECMaster database (October 2007). B.C. Min. For., Victoria, BC.

Meidinger, D.; Chappell, C.; Cadrin, C.; Kittel, G.; McCain, C.; Boggs, K.; Kagan, J.; Cushon, G.; Banner, A.; DeMeo, T. 2005. International vegetation classification of the Pacific Northwest: International correlation of temperate coastal forest plant associations of Oregon, Washington, British Columbia and Alaska. Contributors: B.C. Ministry of Forests, USDA Forest Service, B.C. Conservation Data Centre, Alaska Natural Heritage Program, Washington Natural Heritage Program, Oregon Natural Heritage Information Center.

Characterization References:

British Columbia Conservation Data Centre. 2007. B.C. Species and Ecosystems Explorer. B.C. Min. of Environ. Victoria, BC. Available: <http://www.env.gov.bc.ca/cdc/access.html> (accessed November 26, 2007).

British Columbia Ministry of Forests and Range, Research Branch. 2007. BECMaster database (October 2007). B.C. Min. For., Victoria, BC.

Green, R.N.; Klinka, K. 1994. A field guide to site identification and interpretation for the Vancouver Forest Region. B.C. Min. For., Res. Branch, Victoria, BC. Land Manage. Handb. No. 28. 285 p.

NatureServe. 2007. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.2. NatureServe. Arlington, VA, USA. Available: <http://www.natureserve.org/explorer> (accessed November 26, 2007).

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.

Suggested Citation: Meidinger, D.; Inselberg, A.; Cadrin, C.; Baldwin, K. *Tsuga heterophylla* - *Pseudotsuga menziesii* - *Abies amabilis* / *Hylocomium splendens* [online]. Sault Ste. Marie, Ontario, Canada: Canadian National Vegetation Classification. March, 2011; generated Apr-04-2011; cited ENTER DATE ACCESSED. 9 p. Canadian National Vegetation Classification Association: CNVC00009. Available from <http://cnvc-cnvc.ca>. System Requirements: Adobe Acrobat Reader v. 7.0 or higher. ISSN 1916-3266.