Forest / Forêt **Association CNVC00007**

Tsuga heterophylla - Thuja plicata (Pseudotsuga menziesii - Abies amabilis) / Gymnocarpium dryopteris - Clintonia uniflora

Western Hemlock - Western Red Cedar (Douglas-fir - Pacific Silver Fir) / Common Oak Fern - Singleflower Clintonia

Pruche de l'Ouest - Thuya géant (Douglas de Menzies - Sapin gracieux) / Gymnocarpe du chêne - Clintonie uniflore

Subassociations: none
CNVC Alliance: not yet determined
CNVC Group: not yet determined

Type Description

Concept: This mature to old-growth, coniferous forest association is endemic to the coast / interior climatic transition of the middle to leeward eastern valley systems of the Coast Mountains and the Fraser River valley of British Columbia. It occurs on various topographic positions with mainly steep slope gradients. Mesic, nutrient-rich soils are normal for CNVC00007; soil drainage is variable, ranging from rapid to moderately well. Western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*) co-dominate the canopy, often with Douglas-fir (*Pseudotsuga menziesii*) and Pacific silver fir (*Abies amabilis*). The shrub layer is relatively sparse, comprising mostly regenerating canopy trees with various blueberries: red huckleberry (*Vaccinium parvifolium*), Alaskan blueberry (*V. alaskaense*), and oval-leaved blueberry (*V. ovalifolium*). The diverse herb layer is dominated by three-leaved foamflower (*Tiarella trifoliata*), common oak fern (*Gymnocarpium dryopteris*) and singleflower clintonia (*Clintonia uniflora*). Lanky moss (*Rhytidiadelphus loreus*) and stairstep moss (*Hylocomium splendens*) are the main moss-layer species.

Vegetation: In these mature to old coniferous forests, *Tsuga heterophylla* and *Thuja plicata* dominate the canopy coverage, followed by *Pseudotsuga menziesii*, and often with *Abies amabilis*. Dry summer weather has contributed to a history of extensive wildfires, which in turn, has favoured the widespread distribution of *Pseudotsuga menziesii*. The shrub layer is relatively sparse, with regenerating *Tsuga heterophylla*, *Thuja plicata*, and *Abies amabilis* typically most abundant. *Vaccinium parvifolium*, *V. alaskaense*, *V. ovalifolium* and *Oplopanax horridus* are also commonly present, but with low cover. Although the herb layer often has only moderate cover, it can be diverse. Common herb layer species include *Tiarella trifoliata* (see the Comments section), *Gymnocarpium dryopteris*, S*treptopus lanceolatus*, *Polystichum munitum*, *Dryopteris expansa*, *Clintonia uniflora* and *Cornus canadensis*. *Rhytidiadelphus loreus*, *Hylocomium splendens* and *Plagiomnium* / *Rhizomnium* spp. are the main mosses in the moderately well-developed bryophyte layer.

Tsuga heterophylla - Thuja plicata (Pseudotsuga menziesii - Abies amabilis) / Gymnocarpium dryopteris - Clintonia uniflora CNVC00007

Type Description (cont'd)

Environment: CNVC00007 is found in a coastal maritime / interior continental transitional climate. 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 and 1350 m. In the more northerly or central areas of distribution, much lower elevations are observed - from sea level to 700 m. The rainshadow effects of mountain ranges to the west contribute to summer-dry conditions which can lead to high wildfire hazard. Topopositions for this association vary from upper to lower slopes. Soils are often developed on fluvial and colluvial materials, with textures ranging from loamy to sandy. Rapidly to moderately well-drained, mesic, nutrient-rich soils are normal for these sites. Forest floor materials consist largely of moderately thick (10-12 cm) mors.

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: CNVC00007 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. It is a Canadian endemic association.

Conservation Status (NatureServe)

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

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Distribution

Countries: Canada

Provinces / Territories / States: British Columbia

Ecozones and Ecoregions of Canada: Pacific Maritime: Coastal Gap, Pacific Ranges

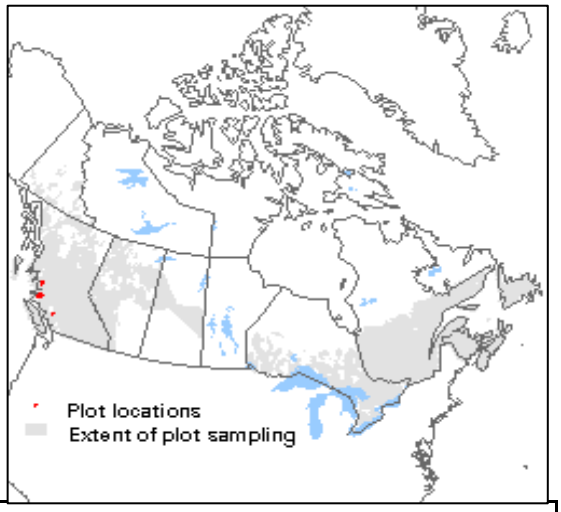
Rowe's Forest Regions and Sections: Coast: Southern Pacific Coast, Northern Pacific Coast

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): Eastern Pacific Ranges, Kimsquit Mountains, Northern Pacific Ranges



Corresponding Types and Associations

CNVC00007	British Columbia	CWH ms 1 /04	*Abies amabilis - Streptopus amplexifolius - Streptopus lanceolatus* (in part)
		CWH ms 2 /04	*Abies amabilis - Streptopus amplexifolius - Streptopus lanceolatus* (in part)

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Vegetation Summary*

	Association CNVC00007 22 plots	
Species Name†	% Cover	% Presence
Overstory Trees		
Tsuga heterophylla	**35**	**95**
Thuja plicata	**30**	**82**
Pseudotsuga menziesii	**32**	**59**
Abies amabilis	**26**	**41**
Picea sitchensis	10	27
Tree Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(65 70 75 80 85)**	
Understory Woody Shrubs and Regenerating Trees		
Oplopanax horridus	2	91
Tsuga heterophylla	12	77
Vaccinium parvifolium	2	77
Vaccinium ovalifolium	3	68
Vaccinium alaskaense	7	59
Menziesia ferruginea	1	55
Thuja plicata	7	50
Abies amabilis	11	45
Paxistima myrsinites	1	36
Ribes lacustre	2	32
Rubus parviflorus	2	32
Acer circinatum	3	27
Rubus spectabilis	3	27
Picea sitchensis	5	23
Viburnum edule	1	23
Sambucus racemosa	1	23
Shrub Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(5 10 25 42 49)**	
Understory Herbs and Dwarf Shrubs		
Gymnocarpium dryopteris	**14**	**91**
Clintonia uniflora	**9**	**82**
Dryopteris expansa	3	82
Cornus canadensis	6	73
Streptopus lanceolatus	4	73
Goodyera oblongifolia	1	73
Polystichum munitum	4	68
Tiarella trifoliata var. *unifoliata*	4	68

Tsuga heterophylla - Thuja plicata (Pseudotsuga menziesii - Abies amabilis) / Gymnocarpium dryopteris - Clintonia uniflora CNVC00007

Vegetation Summary (cont'd)*

	Association CNVC00007	
Species Name†	% Cover	% Presence
Athyrium filix-femina	2	68
Orthilia secunda	1	59
Tiarella trifoliata	6	55
Rubus pedatus	2	45
Maianthemum racemosum	1	45
Maianthemum stellatum	3	41
Chimaphila menziesii	1	41
Prosartes hookeri	2	36
Actaea rubra	1	36
Galium triflorum	0	36
Asarum caudatum	2	32
Streptopus amplexifolius	1	32
Linnaea borealis	1	27
Moneses uniflora	1	27
Adiantum aleuticum	2	23
Chimaphila umbellata	1	23
Pyrola asarifolia	1	23
Corallorhiza maculata	1	23
Viola orbiculata	0	23
Herb Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(15 23 45 64 80)**	
Bryophytes and Lichens		
Rhytidiadelphus loreus	12	82
Hylocomium splendens	23	77
Plagiomnium insigne	5	50
Eurhynchium oreganum	2	50
Plagiochila asplenioides	4	45
Rhytidiopsis robusta	9	41
Plagiothecium undulatum	1	32
Rhizomnium glabrescens	4	27
Rhytidiadelphus triquetrus	2	27
Bryo-Lichen Stratum Cover (P_{10} P_{25} Mean P_{75} P_{90})‡	**(15 20 44 64 89)**	

* 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
‡ $P_x = X^{th}$ percentile (e.g., $P_{10} = 10^{th}$ percentile)

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Site / Soil Characteristics

	Association CNVC00007
	22 plots
Elevation Range (min–mean–max meters)	
	10–388–1228
Slope Gradient (% frequency)	
	very steep (5)
	steep (41)
	moderately steep (23)
	gentle (18)
	level (14)
Aspect (% frequency)	
	north (27)
	east (23)
	south (5)
	west (32)
	level (14)
Meso Topoposition (% frequency)	
	crest / upper (18)
	mid (36)
	lower / toe (9)
	level (18)
	missing data (18)
Moisture Regime (% frequency)	
	mesic (68)
	moist (32)
Nutrient Regime (% frequency)	
	poor (5)
	medium (27)
	rich (64)
	saline (5)

Tsuga heterophylla - Thuja plicata (Pseudotsuga menziesii - Abies amabilis) / Gymnocarpium dryopteris - Clintonia uniflora CNVC00007

Site / Soil Characteristics (cont'd)

	Association CNVC00007
Soil Parent Material (% frequency)	
	colluvium (27)
	fluvial (23)
	glaciomarine (5)
	missing data (45)
Soil Rooting Zone Substrate (% frequency)	
	non-soil (27)
	sandy (36)
	coarse loamy (18)
	silty (5)
	organic (5)
	missing data (9)
Root Restricting Depth (% frequency)	
	0 – 20 cm (9)
	21 – 99 cm (9)
	missing data (82)
Humus Form (% frequency)	
	mor (50)
	moder (36)
	missing data (14)

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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: CNVC00028 *Tsuga heterophylla - Abies amabilis / Oplopanax horridus / Gymnocarpium dryopteris* Forest

Related United States National Vegetation Classification Associations: CEGL002837 *Tsuga heterophylla - Thuja plicata (Abies amabilis) / Cornus canadensis* Forest

Relationships with Other Classifications:

Comments

On rich sites in this climate, the wetter CNVC00028 [*Tsuga heterophylla - Abies amabilis / Oplopanax horridus / Gymnocarpium dryopteris*] typically has *Rubus spectabilis* present as well as an abundance of *Oplopanax horridus*; when *Oplopanax horridus* is present in communities of CNVC00007, it is with low cover.

Tiarella trifoliata (three-leaved foamflower) may include *T. trifoliata* var. *laciniata* (cut-leaved foamflower), *T. trifoliata* var. *trifoliata* (three-leaved foamflower) and/or *T. trifoliata* var. *unifoliata* (one-leaved foamflower).

Source Information

Number of source plots for CNVC00007: 22

Information Sources: British Columbia Ministry of Forests and Range, Research Branch BECMaster database, October 2007 (22 plots)

Concept Authors: 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: November, 2005
Date of Description: March, 2011

Tsuga heterophylla - Thuja plicata (Pseudotsuga menziesii - Abies amabilis) / Gymnocarpium dryopteris - Clintonia uniflora CNVC00007

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.

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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 August 12, 2008).

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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.

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