



Forest / Forêt

Association CNVC00006

***Tsuga heterophylla* - *Pseudotsuga menziesii* - *Thuja plicata* / *Achlys triphylla* -
*Gymnocarpium dryopteris***

Western Hemlock - Douglas-fir - Western Red Cedar / Vanilla-leaf - Common Oak Fern

Pruche de l'Ouest - Douglas de Menzies - Thuya géant / Achlyde à trois folioles - Gymnocarpe du chêne

Subassociations: none

CNVC Alliance: not yet determined

CNVC Group: not yet determined

Type Description

Concept: CNVC00006 is an endemic moist maritime coniferous association that occurs up to approximately 700 mASL along the eastern slopes of the Vancouver Island Ranges of British Columbia and also on adjacent islands of the Discovery Islands Group. Slope positions vary from middle to lower, with gradients that are normally gentle. Well- to moderately well-drained, mesic to moist, comparatively rich, medium-textured soils are typical for this association. In this mature to old-forest stage, Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and western red cedar (*Thuja plicata*) characteristically dominate the canopy. The shrub layer is dominated by western hemlock regeneration, with moderate abundance of red huckleberry (*Vaccinium parvifolium*). There are a number of rich-site indicators, such as vanilla-leaf (*Achlys triphylla*), common oak fern (*Gymnocarpium dryopteris*), three-leaved foamflower (*Tiarella trifoliata*), and western sword fern (*Polystichum munitum*) in the herb layer. Oregon beaked moss (*Eurhynchium oreganum*) and lanky moss (*Rhytidiadelphus loreus*) are the main mosses.

Vegetation: *Pseudotsuga menziesii*, *Tsuga heterophylla*, and *Thuja plicata* characteristically dominate the canopy of these mature to old-forest communities. *Abies amabilis* is occasionally present but is more characteristic of higher elevation climates in this area. Dry summer weather contributes to a history of extensive wildfires, which, along with excellent height growth on these sites, often results in the presence of very large *Pseudotsuga menziesii* reaching well above other conifer species in the canopy. The shrub layer is dominated by *Tsuga heterophylla* regeneration, with moderate abundance of *Vaccinium parvifolium*, *V. alaskaense* and *Mahonia nervosa*. A number of rich-site indicators, such as *Achlys triphylla*, *Gymnocarpium dryopteris*, *Tiarella trifoliata* (see the Comments section) and *Polystichum munitum* are prominent in the herb layer. *Eurhynchium oreganum*, *Rhytidiadelphus loreus* and *Hylocomium splendens* are the main species in the poorly developed moss layer, often with *Plagiomnium insigne* or *Rhytidiopsis robusta*.

Environment: CNVC00006 may be found in moist maritime climates up to roughly 700 mASL. Due to elevation and geography, cool, summer-dry conditions prevail. Slope positions vary from middle to lower, with mainly gentle gradients. Well- to moderately well-drained, mesic to moist, comparatively rich, medium-textured soils are normal for these sites. Forest floor materials are mostly friable, indicating relatively good decomposition rates and nutrient cycling.



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Type Description (cont'd)

Dynamics: As a result of intensive logging on the leeward slopes of the Vancouver Island Ranges in the past century, very few of the once extensive old-forest successional stages remain. Under natural conditions, where stands are sheltered from direct wind exposure and fires are infrequent, stand replacement is gradual through the mortality and replacement of individual or small numbers of canopy trees. Stand-replacing fires, although uncommon, can occur. If not too intense, fire can favour *Pseudotsuga menziesii*, as this species can survive low intensity fire better than the other tree species in this association. These tall forests often have considerable variability in vertical structure and age composition. Balsam woolly adelgid (*Adelges piceae*) poses a medium to high threat for *Abies amabilis*.

Range: This Canadian endemic association occurs at montane elevations along the eastern (leeward) side of the Vancouver Island Ranges of British Columbia, from near Jordan River in the south to Sayward in the north, and also including the islands from Quadra to West Thurlow.

Conservation Status (NatureServe)

Global Conservation Rank: G2

National Conservation Rank: not yet determined

Subnational Conservation Rank: S2 (BC)



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Distribution

Countries: Canada

Provinces / Territories / States: British Columbia

Ecozones and Ecoregions of Canada: Pacific Maritime: Eastern Vancouver Island, Georgia - Puget Basin

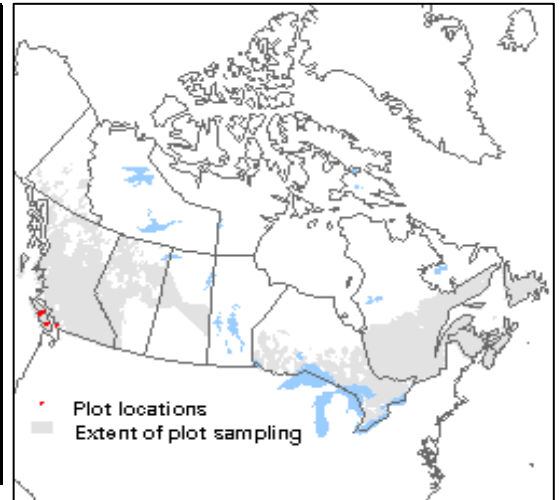
Rowe's Forest Regions and Sections: Coast: Southern Pacific Coast, Strait of Georgia

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

The Nature Conservancy (USA) and Nature Conservancy of Canada Ecoregions: Northwest Coast, Puget Trough

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

Ecoregion Classification System of British Columbia (ecosections): Leeward Island Mountains, Northern Island Mountains



Corresponding Types and Associations

CNVC00006

British Columbia

CWH mm 1 /05

Abies amabilis - *Streptopus amplexifolius* - *Streptopus lanceolatus*



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Vegetation Summary*

Species Name†	Association CNVC00006	
	14 plots	
	% Cover	% Presence
Overstory Trees		
<i>Tsuga heterophylla</i>	32	93
<i>Pseudotsuga menziesii</i>	40	79
<i>Thuja plicata</i>	23	79
<i>Abies amabilis</i>	65	21
Tree Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(73 76 83 90 93)	
Understory Woody Shrubs and Regenerating Trees		
<i>Tsuga heterophylla</i>	25	100
<i>Vaccinium parvifolium</i>	6	100
<i>Mahonia nervosa</i>	2	86
<i>Vaccinium alaskaense</i>	5	71
<i>Rubus spectabilis</i>	1	64
<i>Oplopanax horridus</i>	1	64
<i>Rosa gymnocarpa</i>	1	50
<i>Abies amabilis</i>	3	43
<i>Acer glabrum</i>	1	29
<i>Menziesia ferruginea</i>	0	29
<i>Rubus parviflorus</i>	0	29
<i>Abies grandis</i>	2	21
<i>Amelanchier alnifolia</i>	0	21
<i>Ribes divaricatum</i>	0	21
Shrub Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)‡	(12 15 33 43 58)	
Understory Herbs and Dwarf Shrubs		
<i>Tiarella trifoliata</i>	6	100
<i>Achlys triphylla</i>	27	93
<i>Gymnocarpium dryopteris</i>	13	93
<i>Polystichum munitum</i>	6	86
<i>Maianthemum stellatum</i>	5	79
<i>Cornus canadensis</i>	3	79
<i>Viola sempervirens</i>	1	71
<i>Athyrium filix-femina</i>	1	71
<i>Linnaea borealis</i>	1	71
<i>Prosartes hookeri</i>	3	64
<i>Goodyera oblongifolia</i>	0	64
<i>Lactuca muralis</i>	1	57
<i>Clintonia uniflora</i>	1	50



***Tsuga heterophylla* - *Pseudotsuga menziesii* - *Thuja plicata* / *Achlys triphylla* - *Gymnocarpium dryopteris* CNVC00006**

Vegetation Summary (cont'd)*

Species Name [†]	Association CNVC00006	
	% Cover	% Presence
<i>Galium triflorum</i>	0	50
<i>Tiarella trifoliata</i> var. <i>laciniata</i>	0	50
<i>Adenocaulon bicolor</i>	0	43
<i>Orthilia secunda</i>	0	43
<i>Dryopteris expansa</i>	2	36
<i>Rubus pedatus</i>	1	36
<i>Viola glabella</i>	1	36
<i>Chimaphila menziesii</i>	0	36
<i>Festuca subulata</i>	0	36
<i>Streptopus amplexifolius</i>	3	29
<i>Blechnum spicant</i>	2	29
<i>Chimaphila umbellata</i>	1	29
<i>Rubus ursinus</i>	0	29
<i>Trientalis borealis</i> ssp. <i>latifolia</i>	0	29
<i>Trautvetteria caroliniensis</i>	0	29
<i>Adiantum aleuticum</i>	3	21
<i>Trisetum canescens</i>	0	21
<i>Luzula parviflora</i>	0	21
<i>Asarum caudatum</i>	0	21
Herb Stratum Cover (P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(16 56 61 81 84)	
Bryophytes and Lichens		
<i>Eurhynchium oreganum</i>	7	86
<i>Rhytiadelphus loreus</i>	5	86
<i>Hylocomium splendens</i>	4	79
<i>Plagiomnium insigne</i>	3	64
<i>Rhytidiopsis robusta</i>	3	50
<i>Mnium spinulosum</i>	0	50
<i>Plagiothecium undulatum</i>	1	36
<i>Leucolepis acanthoneuron</i>	1	21
Bryo-Lichen Stratum Cover		
(P₁₀ P₂₅ Mean P₇₅ P₉₀)[‡]	(12 19 29 38 48)	

* 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
 CNVC00006
 14 plots

Elevation Range (min–mean–max meters)
 0–181–500

Slope Gradient (% frequency)
 steep (21)
gentle (50)
 level (29)

Aspect (% frequency)
north (50)
 south (7)
 west (14)
 level (7)
 missing data (21)

Meso Toposition (% frequency)
mid (21)
 missing data (79)

Moisture Regime (% frequency)
 mesic (43)
moist (57)

Nutrient Regime (% frequency)
 poor (29)
 medium (7)
rich (64)



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Site / Soil Characteristics (cont'd)

	Association CNVC00006
Soil Parent Material (% frequency)	moraine / till (21) missing data (79)
Soil Rooting Zone Substrate (% frequency)	sandy (71) coarse loamy (21) fine loamy (7)
Root Restricting Depth (% frequency)	21 – 99 cm (7) missing data (93)
Humus Form (% frequency)	mor (7) missing data (93)



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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: CEG002835 *Tsuga heterophylla* - *Pseudotsuga menziesii* - *Thuja plicata* (*Abies amabilis*) / *Achlys triphylla* - *Gymnocarpium dryopteris* Forest

Relationships with Other Classifications:

Comments

On rich sites in this climate, the wetter CNVC00028 [*Tsuga heterophylla* - *Abies amabilis* / *Oplopanax horridus* / *Gymnocarpium dryopteris*] has abundant *Oplopanax horridus*; if *Oplopanax horridus* is present in communities of CNVC00006, it is with low cover. The dryer, rich-site CNVC00034 [*Tsuga heterophylla* - *Abies amabilis* - *Pseudotsuga menziesii* / *Achlys triphylla* / *Rhytidopsis robusta*] lacks *Gymnocarpium dryopteris* and has lower cover of the other rich-site indicators.

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 CNVC00006: 14

Information Sources: British Columbia Ministry of Forests and Range, Research Branch BECMaster database, October 2007 (14 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



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Gymnocarpium dryopteris CNVC00006**

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 August 14, 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.

Suggested Citation: Meidinger, D.; Inselberg, A.; Cadrin, C.; Baldwin, K. *Tsuga heterophylla* - *Pseudotsuga menziesii* - *Thuja plicata* / *Achlys triphylla* - *Gymnocarpium dryopteris* [online]. Sault Ste. Marie, Ontario, Canada: Canadian National Vegetation Classification. March, 2011; generated Mar-17-2011; cited ENTER DATE ACCESSED. 9 p. Canadian National Vegetation Classification Association: CNVC00006. Available from <http://cnvc-cnvc.ca>. System Requirements: Adobe Acrobat Reader v. 7.0 or higher. ISSN 1916-3266.