



Forest / Forêt

Association CNVC00010

***Thuja plicata* - *Pseudotsuga menziesii* - *Abies grandis* / *Mahonia nervosa* / *Polystichum munitum* - *Achlys triphylla***

Western Red Cedar - Douglas-fir - Grand Fir / Dull Oregon-grape / Western Sword Fern - Vanilla-leaf

Thuja géant - Douglas de Menzies - Sapin grandissime / Mahonia à nervures saillantes / Fougère épée - Achlyde à trois folioles

**Subassociations:** none

**CNVC Alliance:** not yet determined

**CNVC Group:** not yet determined

## Type Description

**Concept:** CNVC00010 occurs on mesic, nutrient-medium sites within the Georgia Depression of British Columbia at elevations up to approximately 200 mASL. The vegetation is characterized by a closed canopy of mixed conifers, including western red cedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), and grand fir (*Abies grandis*), a moderate shrub layer dominated by dull Oregon-grape (*Mahonia nervosa*) and/or salal (*Gaultheria shallon*), a herb layer dominated by western sword fern (*Polystichum munitum*) and vanilla-leaf (*Achlys triphylla*), and a moss layer dominated by Oregon beaked moss (*Eurhynchium oregonum*).

**Vegetation:** CNVC00010 is characterized by a closed canopy and an overstory dominated by high cover of *Thuja plicata*, *Pseudotsuga menziesii*, and/or *Abies grandis*. Low to moderate cover of *Acer macrophyllum* and *Cornus nuttallii* are sometimes present in the tree layer. *Tsuga heterophylla* occasionally occurs but is subordinate in importance to *Thuja plicata* and *Abies grandis*. The shrub layer is dominated by moderate to high cover of *Mahonia nervosa* and *Gaultheria shallon*, together with low cover of *Rosa gymnocarpa* and *Vaccinium parvifolium*. *Holodiscus discolor* often occurs with moderate abundance. *Polystichum munitum* and *Achlys triphylla* are the most prominent species in the herb layer, occurring with low to moderate cover. Other common species, occurring with low cover, include *Tiarella trifoliata* (see the Comments section), *Trientalis borealis*, *Rubus ursinus*, *Galium triflorum*, *Festuca subulata* and *Trillium ovatum*. The well-developed moss layer is dominated by high cover of *Eurhynchium oregonum*, sometimes in association with low covers of *Leucolepis acanthoneuron*, *Hylocomium splendens* and *Rhytidiadelphus triquetrus*.

**Environment:** CNVC00010 occurs within the Georgia Depression of British Columbia from sea level to elevations of approximately 200 m. It occurs mostly on gentle to steep, middle or short slopes of all aspects. Soils are loamy, sandy or silty loams, sometimes with high coarse fragment content, but are moderately rich in nutrients. Soil moisture regimes are mesic or submesic. The range of this association is confined to areas of low annual precipitation (50-100 cm) within the coastal region.

**Dynamics:** These are mid- to late-successional (mature and climax) forest communities. Stands originate from infrequent stand-replacing fires (perhaps every 150-200 years) and occasionally windthrow. Within mature and old forests, small gaps result from the death of single trees or small groups of trees due to root-rots, bark beetles or windthrow. Stand-maintaining surface fires, both aboriginal and lightning-caused, were more frequent (perhaps every 50-100 years) prior to European settlement. Surface fires likely maintained a moderately open overstory. Gap dynamics in old forests result in an all-aged stand structure.



***Thuja plicata - Pseudotsuga menziesii - Abies grandis / Mahonia nervosa / Polystichum munitum - Achlys triphylla* CNVC00010**

### **Type Description (cont'd)**

**Range:** This lowland association occurs within the Georgia Basin of British Columbia and portions of the Puget Trough in adjacent Washington, USA.

### **Conservation Status (NatureServe)**

**Global Conservation Rank:** G1

**National Conservation Rank:** not yet determined

**Subnational Conservation Rank:** S1



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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

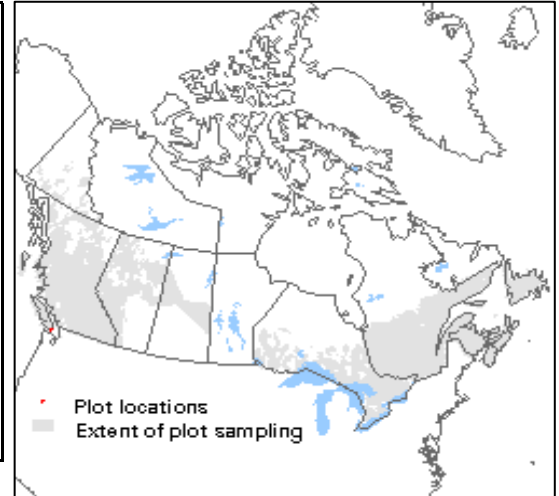
**Rowe's Forest Regions and Sections:** Coast: Strait of Georgia

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

**The Nature Conservancy (USA) and Nature Conservancy of Canada Ecoregions:** Puget Trough

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

**Ecoregion Classification System of British Columbia (ecosections):** Southern Gulf Islands, Nanaimo Lowland



## Corresponding Types and Associations

CNVC00010

British Columbia

CDF mm /04

*Thuja plicata* - *Mahonia nervosa* - *Achlys triphylla*



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### Vegetation Summary\*

Species Name <sup>†</sup>	Association CNVC00010	
	21 plots	
	% Cover	% Presence
<b>Overstory Trees</b>		
<i>Pseudotsuga menziesii</i>	39	90
<i>Thuja plicata</i>	49	86
<i>Abies grandis</i>	33	71
<i>Acer macrophyllum</i>	13	67
<i>Cornus nuttallii</i>	7	52
<i>Taxus brevifolia</i>	5	29
<i>Tsuga heterophylla</i>	10	24
<b>Tree Stratum Cover (P<sub>10</sub> P<sub>25</sub> Mean P<sub>75</sub> P<sub>90</sub>)<sup>‡</sup></b>	<b>(65 70 75 80 85)</b>	
<b>Understory Woody Shrubs and Regenerating Trees</b>		
<i>Mahonia nervosa</i>	27	90
<i>Gaultheria shallon</i>	25	86
<i>Rosa gymnocarpa</i>	1	86
<i>Vaccinium parvifolium</i>	3	76
<i>Holodiscus discolor</i>	14	62
<i>Rhamnus purshiana</i>	1	57
<i>Lonicera ciliosa</i>	2	38
<i>Ilex aquifolium</i>	3	33
<i>Oemleria cerasiformis</i>	1	29
<i>Amelanchier alnifolia</i>	1	29
<i>Symphoricarpos albus</i>	7	24
<b>Shrub Stratum Cover (P<sub>10</sub> P<sub>25</sub> Mean P<sub>75</sub> P<sub>90</sub>)<sup>‡</sup></b>	<b>(5 20 40 50 80)</b>	
<b>Understory Herbs and Dwarf Shrubs</b>		
<i>Trientalis borealis</i> ssp. <i>latifolia</i>	4	95
<i>Rubus ursinus</i>	2	95
<i>Galium triflorum</i>	1	95
<b><i>Polystichum munitum</i></b>	<b>8</b>	<b>90</b>
<b><i>Achlys triphylla</i></b>	<b>9</b>	<b>81</b>
<i>Festuca subulata</i>	1	76
<i>Trillium ovatum</i>	1	76
<i>Linnaea borealis</i>	8	62
<i>Pteridium aquilinum</i>	2	62
<i>Tiarella trifoliata</i>	1	62
<i>Lactuca muralis</i>	1	57
<i>Lathyrus nevadensis</i>	1	57



***Thuja plicata* - *Pseudotsuga menziesii* - *Abies grandis* / *Mahonia nervosa* / *Polystichum munitum* - *Achlys triphylla* CNVC00010**

**Vegetation Summary (cont'd)\***

Species Name <sup>†</sup>	Association CNVC00010	
	% Cover	% Presence
<i>Adenocaulon bicolor</i>	1	48
<i>Bromus vulgaris</i>	1	33
<i>Melica subulata</i>	0	29
<i>Goodyera oblongifolia</i>	0	24
<b>Herb Stratum Cover (P<sub>10</sub> P<sub>25</sub> Mean P<sub>75</sub> P<sub>90</sub>)<sup>‡</sup></b>	<b>(5 25 47 70 70)</b>	
<b>Bryophytes and Lichens</b>		
<i>Eurhynchium oreganum</i>	38	95
<i>Leucolepis acanthoneuron</i>	6	57
<i>Hylocomium splendens</i>	7	48
<i>Rhytidiadelphus triquetrus</i>	9	43
<b>Bryo-Lichen Stratum Cover (P<sub>10</sub> P<sub>25</sub> Mean P<sub>75</sub> P<sub>90</sub>)<sup>‡</sup></b>	<b>(10 15 41 60 80)</b>	

\* species present in > 20% of sample plots are listed

<sup>†</sup> see **Botanical Nomenclature** link at <http://cnvc-cnvc.ca> for botanical sources, synonyms and common names

<sup>‡</sup> P<sub>x</sub> = X<sup>th</sup> percentile (e.g., P<sub>10</sub> = 10<sup>th</sup> percentile)



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### Site / Soil Characteristics

Association  
 CNVC00010  
**21 plots**

**Elevation Range (min–mean–max meters)**  
 31–91–213  
 missing data (48)

**Slope Gradient (% frequency)**  
 very steep (10)  
 steep (10)  
 moderately steep (19)  
 moderate (5)  
**gentle (38)**  
 missing data (19)

**Aspect (% frequency)**  
**north (29)**  
 east (19)  
 south (5)  
 west (24)  
 level (10)  
 missing data (14)

**Meso Toposition (% frequency)**  
 missing data (100)

**Moisture Regime (% frequency)**  
 dry (14)  
**mesic (81)**  
 missing data (5)

**Nutrient Regime (% frequency)**  
 poor (19)  
**medium (67)**  
 rich (10)  
 missing data (5)



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**Site / Soil Characteristics (cont'd)**

	Association CNVC00010
<b>Soil Parent Material (% frequency)</b>	missing data (100)
<b>Soil Rooting Zone Substrate (% frequency)</b>	sandy (14) <b>coarse loamy (67)</b> fine loamy (5) missing data (14)
<b>Root Restricting Depth (% frequency)</b>	<b>21 – 99 cm (29)</b> missing data (71)
<b>Humus Form (% frequency)</b>	moder (29) <b>mull (57)</b> missing data (14)



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### Additional Characteristics

**Species of High Conservation Concern:** Reported habitat for marbled murrelet (*Brachyramphus marmoratus*) (G3G4 [NatureServe], S2B, S4N [BC CDC], T [COSEWIC]); spotted owl (*Strix occidentalis*) (G3 [NatureServe], S1 [BC CDC], E [COSEWIC]); Townsend's big-eared bat (*Corynorhinus townsendii*) (G4 [NatureServe], S3 [BC CDC]).

**Non-native Species:**

**Management Issues:**

### Type Statistics

**Internal Similarity:**

**Confidence:** high

**Strength:**

### Related Concepts

**Similar CNVC Associations:** CNVC00014 *Pseudotsuga menziesii* (*Abies grandis* - *Thuja plicata*) / *Mahonia nervosa* - *Gaultheria shallon*

**Related United States National Vegetation Classification Associations:** CEG002848 *Thuja plicata* - *Pseudotsuga menziesii* - *Abies grandis* / *Mahonia nervosa* / *Polystichum munitum* Forest

**Relationships with Other Classifications:**

### Comments

CNVC00010 is distinguished from the zonal association for this climate, CNVC00014 [*Pseudotsuga menziesii* (*Abies grandis* - *Thuja plicata*) / *Mahonia nervosa* - *Gaultheria shallon*], by high cover of *Polystichum munitum* and presence of other rich-site indicator species such as *Tiarella trifoliata*, *Trillium ovatum*, and the moss *Leucolepis acanthoneuron*.

*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 CNVC00010:** 21

**Information Sources:** British Columbia Ministry of Forests and Range, Research Branch BECMaster database, October 2007 (21 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, K. Iverson, C. Cadrin and K. Baldwin

**Date of Concept:** November, 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 August 12, 2008).

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

British Columbia Ministry of Water, Land and Air Protection. 2004b. Marbled Murrelet in: Accounts and measures for managing identified wildlife. B.C. Min. Water, Land and Air Prot., Victoria, BC. 52 p.

British Columbia Ministry of Water, Land and Air Protection. 2004d. Spotted Owl in: Accounts and measures for managing identified wildlife. B.C. Min. Water, Land and Air Prot., Victoria, BC. 52 p.

Brown, K.J.; Hebda, R.J. 1999. Long-term fire incidence in coastal forests of British Columbia. *Northwest Sci.* 73:41-43.

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.

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