Vancouverian Coastal Rainforest

Macrogroup M024

Forêts pluviales côtières de la région floristique de Vancouver

Cool Temperate Forest & Woodland

D192 Vancouverian Forest & Woodland

M886 Southern Vancouverian Dry Foothill Forest & Woodland

M025 Vancouverian Subalpine – High Montane Forest

M024 Vancouverian Coastal Rainforest

CM024a Drier Vancouverian Rainforest

G0240 North Pacific Maritime Coast Douglas-fir – Western Hemlock Rainforest

CM024b Typic Vancouverian Rainforest

G0237 North Pacific Red Alder – Big-leaved Maple – Coast Douglas-fir Rainforest

G0241 North Pacific Maritime Pacific Silver Fir – Western Hemlock Rainforest

G0751 North Pacific Western Hemlock – Sitka Spruce – Western Red Cedar Rainforest

CM024c Northern Vancouverian Rainforest

G0750 North Pacific Maritime Western Hemlock – Sitka Spruce Rainforest

Concept

M024 describes the low to mid-elevation coastal forests of Pacific maritime temperate climates in western North America. The Canadian expression includes forests of the southern and central British Columbia (BC) coast. Most of these forests are rainforests comprising stands of large trees that are hundreds of years old. Canopies are typically evergreen coniferous, although cold-deciduous broad-leaved species are sometimes present in the tree stratum following disturbance. Stand-replacing fires occur occasionally in drier parts of the range, otherwise gap dynamics driven by pathogens, insects and windthrow is the prevailing disturbance regime. Western hemlock (*Tsuga heterophylla*) is the characteristic tree species. In Canada, other common trees include Pacific silver fir (*Abies amabilis*), western red cedar (*Thuja plicata*), coast Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), Sitka spruce (*Picea sitchensis*), yellow-cypress (*Callitropsis nootkatensis*), grand fir (*Abies grandis*), red alder (*Alnus rubra*) and big-leaved maple (*Acer macrophyllum*). Shore pine (*Pinus contorta* var. *contorta*) is dominant on some very dry sites. Western white pine (*Pinus monticola*) and mountain hemlock (*Tsuga mertensia*) occur occasionally. The understory is typically dominated by broad-leaved shrubs, conifer regeneration, ferns and a well-developed moss layer. Common shrubs include oval-leaved blueberry (*Vaccinium ovalifolium*), red huckleberry (*V. parvifolium*), salal (*Gaultheria shallon*), false azalea (*Menziesia ferruginea*) and, in drier climate areas, Cascade barberry (*Berberis nervosa*). Deer fern (*Blechnum spicant*) is the most widespread herb; others include foamflowers (*Tiarella* spp.) and western sword fern (*Polystichum munitum*). Lanky moss (*Rhytidiadelphus loreus*), stairstep moss (*Hylocomium splendens*) and Oregon beaked moss (*Kindbergia oregana*) predominate in the moss layer.

In Canada, M024 forests occur between sea level and approximately 1000 mASL in a maritime temperate climate, with cool summers, mild winters and high annual precipitation. Mean annual precipitation varies between approximately 1200 and 4300 mm, the majority falling as rain in winter months; snow is only a minor proportion and localized within the range. Mean annual temperatures vary from approximately 3°to 10° C, depending mostly on latitude and elevation; soils typically don't freeze in winter. Growing degree days above 5° C (GDD) vary between approximately 1000 and 2200 across the Canadian range. All parts of the Canadian range experienced Pleistocene glaciation; soils are mostly Podzols developed in glacial surficial materials. Mor humus forms predominate.

Three subtypes characterize regional variation in the Canadian range of M024. CM024a [Drier Vancouverian Rainforest] primarily occurs in drier climatic areas where there is a history of fire. Coast Douglas-fir co-dominates in the canopy. Conversely, CM024c [Northern Vancouverian Rainforest] describes the Canadian expression of Pacific coastal rainforests at the northern edge of their global range. These forests are dominated by western hemlock and Sitka spruce and notable for the absence of Pacific silver fir and coast Douglas-fir. CM024b [Typic Vancouverian Rainforest] is the predominant condition occurring over most of the Canadian range.

Old-growth coastal rainforest dominated by western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*). Central coast of British Columbia (Great Bear Rainforest).
Source: W. MacKenzie, British Columbia Forest Service

Western hemlock (*Tsuga heterophylla*) dominated stand with dense shrub understory dominated by salal (*Gaultheria shallon*) and oval-leaved blueberry (*Vaccinium ovalifolium*). Near Kemano, British Columbia.
Source: British Columbia Forest Service

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Vegetation

Physiognomy and Structure

M024 includes upland forests with closed, multi-layered canopies characterized by tall (often >40 m; single trees up to 70-75 m) long-lived, evergreen coniferous tree species. Most of these forests are rainforests (see Comments) comprising stands that are hundreds of years old. Cold-deciduous broad-leaved ("hardwood") species are sometimes present in the tree stratum, typically following disturbance. Stand composition is usually of multiple conifer species, but conifer – hardwood mixes and pure hardwood compositions can occur. Vertical stand structure is typically multi-storied, but can be single-storied after stand-replacing disturbance. Understory structure varies from dense to sparse, and is usually dominated by cold-deciduous and evergreen broad-leaved shrubs, conifer regeneration and ferns. The moss layer is typically well developed, especially under conifer canopies. Some of these forests are among the most productive of any Canadian forests and species diversity can be high, especially of trees and bryophytes. Riparian and wetland forests and woodlands within the range of M024 are described by M035 [Vancouverian Flooded & Swamp Forest].

Floristics

Tsuga heterophylla is the characteristic tree species for M024. *Thuja plicata* is the most common canopy associate, except at the northern edge of the range where its frequency of occurrence is diminished. *Picea sitchensis* and *Alnus rubra* are widespread throughout the Canadian range. *Pseudotsuga menziesii* [see Comments] occurs in drier maritime and submaritime climates and on dry sites in wetter climates. *Abies amabilis, Callitropsis nootkatensis* and, occasionally, *T. mertensiana* are most abundant in moister climates, including higher elevations and hypermaritime areas, but the former is absent from Haida Gwaii. In M024, *Pinus contorta* var. *contorta* is dominant on some very dry sites and can be an early seral species on some mesic or moist sites (its occurrence on very wet sites is described in M035 [Vancouverian Flooded & Swamp Forest]). *Abies grandis, Pinus monticola* and *Acer macrophyllum* are found in the southern part of the Canadian range.

Within the Canadian range of M024, three subtypes are recognized based on climatic conditions and floristic differentiation. CM024a [Drier Vancouverian Rainforest] primarily occurs on southeastern Vancouver Island and the adjacent mainland of British Columbia (BC) where there is a history of fire. It is dominated by *P. menziesii,* usually with *T. heterophylla* and *T. plicata,* and contains a presence of various species with southern distributions (e.g., *A. grandis*). Conversely, CM024c [Northern Vancouverian Rainforest] describes the Canadian expression of Pacific coastal rainforests in the northern portion of their global range (mostly in Alaska). In Canada, these forests are dominated by *T. heterophylla* and *P. sitchensis* and notable for the absence of *A. amabilis, P. menziesii* and other key M024 species; *T. plicata* is near the northern limit of its range and is much reduced in both frequency and abundance. CM024b [Typic Vancouverian Rainforest] is the predominant condition occurring over most of the Canadian range of M024.

Tsuga heterophylla, Thuja plicata and *Abies amabilis* are wide-ranging late seral species that can re-colonize sites following stand-replacing disturbance or invade existing early or mid-seral stands (usually of *Alnus rubra* or *Acer macrophyllum*) by seeding in from surrounding areas. They also maintain themselves within stands where they are already established. Seeds of these species are able to germinate and survive on seedbeds of mineral soil, litter, moss, thick humus and dead wood as long as substrate moisture is sufficient. They are highly shade tolerant, so seedlings persist under closed canopies for many years and are able to respond to release after long periods of suppression. Once in the main canopy they dominate uneven-aged stands. *T. heterophylla* and *T. plicata* are also able to regenerate vegetatively within the closed canopy stands that are characteristic of M024. These are large (often >30 m tall), long-lived species that survive as mature trees for hundreds of years in the absence of disturbance. In M024, *Callitropsis nootkatensis* occurs at higher elevations or in hypermaritime areas, where it is often a canopy co-dominant with *T. heterophylla, T. plicata* and *A. amabilis.*

Pseudotsuga menziesii is a long-lived early seral species that establishes on open sites following disturbance that exposes mineral soil seedbeds, wherever there is an adequate seed supply. *P. menziesii* is common in drier locations (either edaphically or climatically) where occasional wildfires occur. With its thick bark, it is somewhat resistant to moderate-intensity surface fires and older individuals can persist in stands for long periods, often hundreds of years, maintaining seed sources in the post-fire stands.

Picea sitchensis is an early seral species that prefers well-drained moist, rich sites in areas with moderate to high inputs of rainfall or fog. It is tolerant of sodium and high water tables, often occurring in coastal areas within the spray zone, on high benches in estuarine areas and on raised marine beach systems where it is able to benefit from saltwater nutrient inputs. It is also common on stable high terraces in river floodplains. In the southern part of the Canadian range of M024, *P. sitchensis* is mostly restricted to these specialized sites, but in the wetter climate of the northern range it occurs across a wide variety of habitats. Seedling survival is best on moist mineral soil seedbeds, on rotting logs in unshaded areas or in the light shade of early seral broad-leaved stands (e.g., *Alnus rubra* or *Acer macrophyllum*); *P. sitchensis* can also reproduce vegetatively on wetter sites by layering. Once established in the canopy, individuals of *P. sitchensis* can survive as mature trees for hundreds of years and grow to heights >60 m.

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Floristics (cont'd)

Alnus rubra and *Acer macrophyllum* are early seral species that often form even-aged stands following stand-replacing disturbance. *Pinus contorta* var. *contorta* is an early seral species that usually occurs in extreme habitats, typically on very wet soils, on poor coarse-textured soils or on exposed bedrock sites with shallow soils, where it reproduces by seed from non-serotinous cones. Upland occurrences of *P. contorta* var. *contorta* are included in M024; wetland occurrences are described in M035 [Vancouverian Flooded & Swamp Forest]. Within the Canadian range of M024, *Abies grandis* is confined to the southernmost parts of BC (CM024a) where it occurs primarily on moist, nutrient-rich sites in mixed early or mid-seral stands. Unlike other *Abies* spp., *A. grandis* does not readily establish beneath a closed canopy.

Stand-scale species composition of the understory reflects local climate, degree of canopy closure and site conditions. On circum-mesic sites, *Vaccinium parvifolium, Gaultheria shallon, Vaccinium ovalifolium* (see Comments) and *Tiarella trifoliata* are common understory species throughout the Canadian range of M024. Fern species (especially *Polystichum munitum, Blechnum spicant, Dryopteris expansa* and *Athyrium filix-femina*) and a diverse, well-developed bryophyte layer (including *Rhytidiadelphus loreus, Hylocomium splendens, Kindbergia oregana, Buckiella undulata* and *Rhytidiopsis robusta*) are also characteristic. Moist sites feature *Rubus spectabilis* and/or *Oplopanax horridus*, along with leafy mosses (*Mnium* spp., *Plagiomnium* spp., *Rhizomnium* spp.).

In drier maritime climates over much of the southern Canadian range (CM024a), common understory species include *Berberis nervosa, Rosa gymnocarpa, Acer circinatum, Rubus ursinus, Pteridium aquilinum, Achlys triphylla, Lysimachia borealis, Mycelis muralis* and *Rhytidiadelphus triquetrus*. In wetter maritime and hypermaritime climates, *Menziesia ferruginea, Coptis aspleniifolia, Maianthemum dilatatum* and *Gymnocarpium dryopteris* are more prevalent in the shrub and herb layers, and *Dicranum* spp., *Scapania bolanderi* and *Polytrichastrum alpinum* in the bryophyte layer.

In the submaritime eastern part of the range, some maritime species (e.g., *G. shallon, V. parvifolium, B. spicant*) become less common, while species from the BC interior, such as *Vaccinium membranaceum, Clintonia uniflora, Chimphilla umbellata* and *Pleurozium schreberi*, are present.

Dynamics

Environmental site characteristics, plant species autecology, seed/propagule availability, and disturbance history (i.e., type, severity and frequency) influence secondary succession trends within the forests of M024. Wildfires, windthrow, slope failures, pathogens and insect infestations are the most widespread forms of natural disturbance throughout the range. Forest harvesting, roadbuilding, agricultural conversion and settlement clearance, urban development, and industrial and recreational activities are also significant disturbance factors in some areas. In general terms, stand-replacing fire plays a relatively minor role in the disturbance regime of Canadian M024 forests. However, fire becomes an increasingly important factor in stand dynamics where drier climatic conditions exist in the more southern and submaritime (eastern) portions of the Canadian range, as well as in scattered dry microclimatic or edaphic locations throughout the range. Stand conditions that are characteristic of higher fire frequency, including prominence of *Pseudotsuga menziesii,* are described by subtype CM024a [Drier Vancouverian Rainforest]. Fires are very infrequent in forests described by CM024b [Typic Vancouverian Rainforest] and CM024c [Northern Vancouverian Rainforest].

A large component of M024 forests in the Canadian range consists of rainforests in moist to wet climates that rarely burn (i.e., fire cycle >500 years), potentially resulting in very old stands (in some cases >1000 years old). Canopy gaps created by windthrow are the dominant drivers of stand dynamics. Where windthrow is more pervasive, moderate-scale gaps can be created in single wind events resulting in a spatial mosaic of variously aged stand-sized patches on the forest landscape. If wind exposure is limited, stand replacement is more gradual through the process of mortality of individuals or small numbers of canopy trees. In these cases, small gaps develop in mature and old forests due to diseases, insects or fine-scale windthrow. The average time between successive gap disturbances within a stand varies between approximately 300 and 1400 years.

Where fire does occur (or did occur historically), in the driest submaritime and southern parts of the Canadian range, fire cycles were typically intermediate (100-270 years) or long (270-500 years) with stand-replacing fires occurring every 150-500 years (on average) and mixed-severity fires approximately every 50-100 years. *Pseudotsuga menziesii* dominates in post-fire stands, although other tree species (especially *Tsuga heterophylla* and *Thuja plicata*) may regenerate immediately or invade early seral stands depending upon available seed sources and post-fire conditions. Following fire, regenerating stands are often even-aged although presence of long-lived *P. menziesii* survivors in fire-originated stands often creates a multi-aged demographic structure. Fires vary considerably in extent, and burn severity is variable within each fire so a spatial mosaic of variously aged patches with different species mixes is typical on the post-fire landscape.

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Dynamics (cont'd)

In the Canadian range, early seral forests of *Alnus rubra* and/or *Acer macrophyllum* are more abundant on the landscape than they were historically, due to post-settlement anthropogenic disturbances. Urban development in southwestern British Columbia has significantly altered the expression of M024 forests. Forest harvesting has increased the proportion of early seral stands away from settlements and, in some cases, has altered the historic proportion of tree species. Aside from anthropogenic activities and windthrow, the most frequent stand-replacing events are geomorphic, including localized rock slides, debris flows and avalanches.

A variety of diseases and insects are endemic to these forests. Typically, mortality is limited to individual or small groups of trees within stands, but occasional broad-scale infestations are capable of creating changes in tree species dominance at both the stand and landscape levels. Hemlock dwarf mistletoe (*Arceuthobium tsugense*), rust-red stringy rot (*Echinodontium tinctorium*), laminated root rot (*Phellinus weirii*), red ring rot (*Phellinus pinii*), armillaria root disease (*Armillaria ostoyae*) and annosus root disease (*Heterobasidion annosum*) are widespread in forests of M024, causing mortality of young trees and increasing the susceptibility of older trees to windthrow and insect attack. The interaction between root-rot and stem-rot pathogens and windthrow results in gap formation in most mature stands.

Periodic insect outbreaks are a natural part of the ecology of these forests. Western hemlock looper (*Lambdina fiscellaria lugubrosa*) can be a serious defoliator of *Tsuga heterophylla. Pseudotsuga menziesii* populations are attacked by western spruce budworm (*Choristoneura occidentalis*) and Douglas-fir beetle (*Dendroctonus pseudotsugae*). *Picea sitchensis* is susceptable to spruce beetle (*D. rufipennis*) and spruce weevil (*Pissodes strobi*), the latter having significant commercial impacts in the southern portion of the Canadian range. Balsam woolly adelgid (*Adelges piceae*) is a serious invasive pest of *Abies amabilis* and *A. grandis*.

Environment

Climate

In Canada, M024 develops at low to mid-elevations along the Pacific coast of southern and central British Columbia where mild, wet Pacific air masses provide moderate temperatures and high precipitation. In general terms, the climate is maritime temperate, with cool summers, mild winters and high annual precipitation, the majority of which falls in winter.

Mean annual precipitation is generally high, averaging >2200 mm (varying from approximately 1200 to 4300 mm). The majority of total precipitation falls as rain; snow is only a minor proportion, occurring mostly in northern, montane and submaritime areas, and "rain-on-snow" events are common wherever snowpack accumulates. Rain shadow effects from the Queen Charlotte Ranges, the Vancouver Island Ranges, the Olympic Mountains and, in some places, the Coast Mountains create the largest variability in precipitation patterns across the Canadian range of M024, accounting for the lower values in the continuum. CM024a [Drier Vancouverian Rainforest] describes forests that typically occur in areas with lower precipitation (thus having an increased frequency of fire). In the hypermaritime zone along the immediate coast, frequent fog and low clouds during warmer months produce a uniformly wet and mild climate, with fog drip often contributing significant additional site moisture. Away from the coast, the climate is still relatively mild but with typically lower overall precipitation and greater temperature extremes. Mean annual temperature varies from approximately 3° to 10° C, depending mostly on latitude and elevation. Growing degree days above 5° C (GDD) vary between approximately 1000 and 2200 GDD throughout the Canadian range. Frozen soils are uncommon in winter, which is important for the survival of many of the coastal plant species.

Physiography, Geology, Topography and Soils

M024 occurs in the westernmost Cordillera of North America. In Canada, it occupies the windward portions of the Coast mountains in British Columbia (BC), including the Pacific Ranges, the Kitimat Ranges and some lower valleys in the Boundary Ranges. It also occurs in the insular mountains of Vancouver Island and Haida Gwaii, as well as their adjoining coastal lowlands. A minor portion of the range occurs in the Cascade Mountains of southwestern BC and the St. Elias Mountains of northern BC. M024 occurs at sea level over most of its range and extends up to about 900 mASL in southern BC and to 450 mASL in northern BC on windward slopes. On leeward slopes in the eastern part of the range, the upper elevation can reach 1000 mASL in southern BC.

The geology of the Canadian west coast is varied. The Coast, Cascade and St. Elias Mountains are primarily crystalline igneous and metamorphic rocks. The Vancouver Island and Queen Charlotte Ranges, as well as the coastal lowlands, comprise mostly folded and faulted volcanic and sedimentary Tertiary rocks. All of these areas have been glaciated numerous times and the most prevalent parent material is glacial till. Due to the steep mountainous slopes, often with bedrock exposures, colluvium is also common. Several large rivers terminate at the Pacific Ocean, creating riparian and estuarine benches, beaches and deltas of alluvial materials. Parent material textures vary considerably but are mostly coarse to medium-textured with moderate to high coarse fragment content. Although geologically young, the soils are generally well developed. Due to the wet and cool climate, organic matter tends to accumulate. The predominant soil forming processes are podzolization and mor humus formation. Soils are mostly Podzols, with some Folisols; Gleysols occur locally on moist, poorly drained sites.

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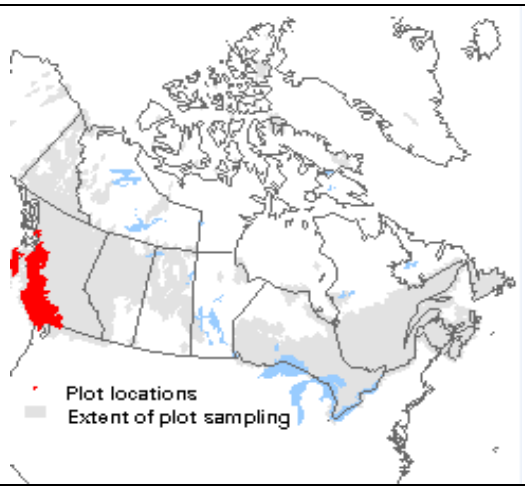
Distribution and Geographic Range

In Canada, M024 includes low to mid-elevation forests along the Pacific coast of British Columbia, including Haida Gwaii and most of Vancouver Island. On the mainland, these forests occur on the windward side of the Coast Mountains and extend to the leeward side in some of the major river valleys. The Canadian range lies in the northern portion of the global range of temperate rainforests of western North America extending from the Gulf of Alaska to northern California but lying within 60-120 km of the Pacific coast.



Related Concepts

M024 includes upland forests and woodlands that have been described in provincial publications for the Coastal Western Hemlock and parts of the Coastal Douglas-Fir biogeoclimatic zones in British Columbia.

USNVC M024 [Vancouverian Coastal Rainforest] describes the rangewide characteristics of low elevation temperate coastal rainforests of western North America. This CNVC factsheet describes the Canadian expression of this vegetation, which includes conditions treated (at least in part) in USNVC Groups G237 [North Pacific Red Alder – Bigleaf Maple – Douglas-fir Rainforest Group], G240 [North Pacific Maritime Douglas-fir – Western Hemlock Rainforest Group], G241 [North Pacific Maritime Silver Fir – Western Hemlock Rainforest Group], G750 [North Pacific Maritime Western Hemlock – Sitka Spruce Rainforest Group] and G751 [North Pacific Western Hemlock – Sitka Spruce – Western Red-cedar Rainforest Group].

Riparian and wetland forests and woodlands within the range of M024 are described by M035 [Vancouverian Flooded & Swamp Forest].

Comments

M024 describes low elevation rainforests found in the wet maritime temperate climates of the Pacific coast of North America. Drier maritime climate forests and woodlands, lacking *Tsuga heterophylla* and dominated by *Pseudotsuga menziesii* var. *menziesii*, often with *Quercus garryana* and/or *Arbutus menziesii*, are included in M886 [Southern Vancouverian Dry Foothill Forest & Woodland]. Higher elevation montane and subalpine forests and woodlands contiguous with the range of M024 are characterized by M025 [Vancouverian Subalpine – High Montane Forest]. Lower elevation forests and woodlands of continental temperate climates east of the Coast Mountains are described by M890 [Rocky Mountain Intermontane Subboreal Forest], M501 [Central Rocky Mountain Dry Lower Montane – Foothill Forest] or M500 [Central Rocky Mountain Mesic Lower Montane Forest]. Higher elevation montane and subalpine forests of continental temperate climates on the eastern side of the Coast Mountains are described by M020 [Rocky Mountain Subalpine – High Montane Forest].

Pseudotsuga menziesii here refers to variety *menziesii* (coast Douglas-fir).
Vaccinium ovalifolium here includes *V. alaskaense* (Alaska blueberry), according to VASCAN.

The term “rainforest” is used sensu Alaback (1991):

1) greater than 1400 mm annual precipitation, 10% or more occurring during the summer months;
2) cool frequently overcast summers, July isotherm < 16° C;
3) fire infrequent, and not an important evolutionary factor;
4) dormant season caused by low temperatures, may be accompanied by transient snow.

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Source Information

Number of Source Plots for M024: 6322 (BECMaster ecosystem plot database [VPro13/MSAccess 2010 format]).

Information Sources (data):
Biogeoclimatic Ecosystem Classification Program of British Columbia. 2011. BECMaster ecosystem plot database [VPro13/MSAccess 2010 format]. W.H. MacKenzie, (ed.) B.C. Min. For., Lands, and Nat. Res. Ops., Smithers, BC. Available: www.for.gov.bc.ca/hre/becweb/resources/information-requests (accessed: June 2015). (6322 plots)

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Description Authors: D. Meidinger and K. Baldwin
Date of Concept: April, 2015
Date of Description: August, 2017

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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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Vancouverian Coastal Rainforest

Macrogroup M024

Forêts pluviales côtières de la région floristique de Vancouver

Comparison of Vegetation Characteristics for Vancouverian Forest Macrogroups

		n=735	n=6322	n=418	
Lifeform	**Species Name**	**M886 Dry Vancouverian**	**M024 Rainforest**	**M025 Subalpine**	**Species Common Name**
Tree	*Quercus garryana* var. *garryana*	*****			Garry oak
	Abies grandis	****			grand fir
	Arbutus menziesii	■■■■			Pacific arbutus
	Thuja plicata	■■■■	■■■■		western red cedar
	Pseudotsuga menziesii var. *menziesii*	■■■■■	■■■■■		coast Douglas-fir
	Picea sitchensis		****		Sitka spruce
	Tsuga heterophylla		■■■■■	■■■■	western hemlock
	Abies amabilis		■■■■■	■■■■■	Pacific silver fir
	Tsuga mertensiana			■■■■■	mountain hemlock
	Callitropsis nootkatensis			■■■■	yellow-cypress
Shrub	*Symphoricarpos albus*	***			thin-leaved snowberry
	Lonicera hispidula + L. ciliosa	***			pink & orange honeysuckles
	Rosa gymnocarpa	■■			dwarf woodland rose
	Holodiscus discolor	■■■■			oceanspray
	Berberis nervosa	■■■■			Cascade barberry
	Gaultheria shallon	■■■■	■■■■		salal
	Vaccinium parvifolium	**	■■■	**	red huckleberry
	Rubus spectabilis		■■■		salmonberry
	Vaccinium ovalifolium		■■■■	■■■■■	oval-leaved blueberry
	Menziesia ferruginea		■■■	■■■	false azalea
	Vaccinium membranaceum			■■■■	mountain huckleberry
	Sorbus sitchensis			■■	Sitka mountain-ash
	Elliottia pyroliflora			***	copperbush
Herb/ Dwarf Shrub	*Pteridium aquilinum*	***			bracken fern
	Rubus ursinus	■■			Pacific trailing blackberry
	Polystichum munitum	■■	■■■■		western sword fern
	Dryopteris expansa		■■■		spreading wood fern
	Athyrium filix-femina		***		common lady fern
	Tiarella trifoliata		■■■	***	three-leaved foamflower
	Blechnum spicant		■■■	■■	deer fern
	Cornus canadensis		■■■	■■	bunchberry
	Rubus pedatus		***	■■■	five-leaved dwarf bramble
	Streptopus spp.		**	■■■	twistedstalks
	Neottia cordata + N. banksiana		**	*	twayblades
	Veratrum viride			■■	green false hellebore
	Phyllodoce empetriformis			***	pink mountain heather
	Coptis aspleniifolia			**	fern-leaved goldthread
	Nephrophyllidium crista-galli			***	deer cabbage
Moss/Lichen	*Rhytidiadelphus triquetrus*	****			electrified cat's-tail moss
	Kindbergia oregana	■■■■	■■■■		Oregon beaked moss
	Hylocomium splendens	■■■■	■■■■	****	stairstep moss
	Buckiella undulata		■■■		flat moss
	Mniaceae		■■■	■■■	leafy mosses
	Rhytidiadelphus loreus		■■■■	■■■■	lanky moss
	Rhytidiopsis robusta			■■■■	pipecleaner moss

Legend

Constancy:	Black bar >= 50%	*Cover:*	5 bars >= 25%	2 bars >=1%
	Grey bar >= 30%		4 bars >= 10%	1 bar <1%
	Asterisk >= 20%		3 bars >= 3%	

Vancouverian Coastal Rainforest

Macrogroup M024

Forêts pluviales côtières de la région floristique de Vancouver

Comparison of Vegetation Characteristics for Macrogroup Subtypes in M024

		n=1553	n=4292	n=477	
Lifeform	**Species Name**	**CM024a Drier**	**CM024b Typic**	**CM024c Northern**	**Species Common Name**
Tree	*Abies grandis*	****			grand fir
	Alnus rubra	****			red alder
	Acer macrophyllum	■■■■			big-leaved maple
	Pseudotsuga menziesii var. *menziesii*	■■■■■			coast Douglas-fir
	Thuja plicata	■■■■	■■■■	■■■■	western red cedar
	Tsuga heterophylla	■■■■■	■■■■■	■■■■■	western hemlock
	Picea sitchensis		■■■■	■■■■■	Sitka spruce
	Abies amabilis		■■■■■		Pacific silver fir
	Callitropsis nootkatensis		****		yellow-cypress
Shrub	*Rosa gymnocarpa*	**			dwarf woodland rose
	Berberis nervosa	■■■			Cascade barberry
	Gaultheria shallon	■■■■	■■■■	*****	salal
	Vaccinium parvifolium	■■■	■■■	■■■	red huckleberry
	Rubus spectabilis	***	■■■	■■■■	salmonberry
	Vaccinium ovalifolium	***	■■■■	■■■■	oval-leaved blueberry
	Menziesia ferruginea		■■■	■■■	false azalea
	Oplopanax horridus		***	■■■■	devil's club
Herb/ Dwarf Shrub	*Mycelis muralis*	**			wall lettuce
	Lysimachia borealis	**			northern starflower
	Achlys triphylla	■■■			vanilla-leaf
	Pteridium aquilinum	■■■			bracken fern
	Rubus ursinus	■■			Pacific trailing blackberry
	Polystichum munitum	■■■■	***	■■■	western sword fern
	Tiarella trifoliata	■■■	■■■	■■■	three-leaved foamflower
	Dryopteris expansa	***	■■■	■■■	spreading wood fern
	Athyrium filix-femina	***	***	■■■	common lady fern
	Blechnum spicant	***	■■■	■■■	deer fern
	Cornus canadensis		■■■	■■■	bunchberry
	Rubus pedatus		■■■	***	five-leaved dwarf bramble
	Neottia cordata + *N. banksiana*		■■		twayblades
	Coptis aspleniifolia		**		fern-leaved goldthread
	Streptopus spp.		■■	■■■	twistedstalks
	Maianthemum dilatatum		**	■■■	2-leaved false Solomon's seal
	Gymnocarpium dryopteris		***	■■■	common oak fern
Moss/Lichen	*Rhytidiadelphus triquetrus*	***			electrified cat's-tail moss
	Rhytidiopsis robusta	****	****		pipecleaner moss
	Rhytidiadelphus loreus	■■■	■■■■	■■■■	lanky moss
	Hylocomium splendens	■■■■	■■■■	■■■■	stairstep moss
	Mniaceae	■■■	■■■	■■■■	leafy mosses
	Kindbergia oregana	■■■■	■■■	■■■■	Oregon beaked moss
	Buckiella undulata	***	■■■	■■■	flat moss
	Dicranum spp.		■■	***	broom mosses
	Scapania bolanderi		***		Bolander's earwort
	Polytrichastrum alpinum			***	alpine haircap moss
	Plagiochila asplenioides			***	greater featherwort

Legend

Constancy:	Black bar >= 50%	*Cover:*	5 bars >= 25%	2 bars >=1%
	Grey bar >= 30%		4 bars >= 10%	1 bar <1%
	Asterisk >= 20%		3 bars >= 3%	