

## Cordilleran Rainforest



### General Description

The *Cordilleran Rainforest* zone covers an area of almost 55,000 km<sup>2</sup> in northwestern and southeastern British Columbia (BC). It is found where relatively high precipitation occurs east of the coastal mountains, creating an “interior wet belt”. This zone represents the northern portion of “interior” moist conifer forests that also occur at low to mid-elevations in eastern Washington, northern Idaho and western Montana. Landcover is dominated by evergreen coniferous forests.

### Vegetation

Upland vegetation is dominated by evergreen coniferous forests characterized by tall, long-lived trees in stands that may persist for centuries. Stand structure is typically multi-storied, but can be single-storied after stand-replacing disturbance. Cold-deciduous broad-leaved tree species are sometimes present following disturbance. Understory structure varies from dense to sparse, and is usually dominated by cold-deciduous broad-leaved shrubs, conifer regeneration and perennial herbs. The moss layer is typically well developed, especially under conifer canopies.

Stand-replacing fires occur less frequently than in other forests of the BC interior; gap dynamics driven by pathogens, insects and windthrow are the prevailing stand regeneration processes. Forest harvesting is a significant disturbance factor throughout the zone. Crop cultivation and other human modification of the landscape is relatively minor, and mostly confined to a few river valleys in

the southern part of the zone. In some river valleys, large hydroelectric reservoirs have flooded otherwise forested terrestrial lands.

Western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*) are the characteristic tree species, often dominating uneven-aged stands. Subalpine fir (*Abies lasiocarpa*) and hybrids of white spruce (*Picea glauca*) [i.e., interior spruce (*Picea engelmannii* x *glauca*) throughout the zone; Lutz spruce (*Picea xlutzii*) in the northwestern portion] are common associates, while younger stands may contain lodgepole pine (*Pinus contorta* var. *latifolia*). Trembling aspen (*Populus tremuloides*) and paper birch (*Betula papyrifera*) are often present but only dominate in some early seral stands. Rocky Mountain Douglas-fir (*Pseudotsuga menziesii* var. *glauca*) occurs over all but the northernmost portions of the zone. Alluvial forests dominated by black cottonwood (*Populus trichocarpa*) occur on stable floodplain terraces.

Understories vary from dense, species-rich shrub and herb conditions to a continuous feathermoss ground cover with only a few erect vascular plants. Common shrubs include mountain huckleberry (*Vaccinium membranaceum*), falsebox (*Paxistima myrsinites*), western thimbleberry (*Rubus parviflorus*), devil's club (*Oplopanax horridus*), oval-leaved blueberry (*Vaccinium ovalifolium*), Rocky Mountain maple (*Acer glabrum*) and saskatoon (*Amelanchier alnifolia*). Typical herb/dwarf shrub species include single-flowered clintonia (*Clintonia uniflora*), bunchberry (*Cornus canadensis*), three-leaved foamflower (*Tiarella trifoliata*), twisted-stalks

(*Streptopus* spp.), five-leaved dwarf bramble (*Rubus pedatus*), common pipsissewa (*Chimaphila umbellata*), wild sarsaparilla (*Aralia nudicaulis*) and twinflower (*Linnaea borealis*). Ferns often constitute an important component of the herb layer, especially common oak fern (*Gymnocarpium dryopteris*) and common lady fern (*Athyrium filix-femina*). Frequently occurring mosses are red-stemmed feathermoss (*Pleurozium schreberi*), knight's plume moss (*Ptilium crista-castrensis*), stairstep moss (*Hylocomium splendens*), pipecleaner moss (*Rhytidiopsis robusta*) and electrified cat's-tail moss (*Rhytidiadelphus triquetrus*).

Wetlands are relatively common on the landscape, but are rarely extensive. Swamps and fens are scattered in small poorly drained basins, but shoreline marshes are relatively common along the margins of waterbodies. Treed wetlands are dominated by western red cedar, western hemlock, subalpine fir and spruces.

Shallow marshes and wetter fens usually are dominated by sedges (especially water sedge [*Carex aquatilis*], Sitka sedge [*C. aquatilis* var. *dives*], northern beaked sedge [*C. utriculata*]), common spikerush (*Eleocharis palustris*), water horsetail (*Equisetum fluviatile*) or broad-leaved cattail (*Typha latifolia*). Shrub swamps, annually active floodplains and hummocky fens include arctic dwarf birch (*Betula nana*), mountain alder (*Alnus incana* ssp. *tenuifolia*), willows (e.g., Sitka willow [*Salix sitchensis*]), yellow skunk cabbage (*Lysichiton americanus*), Douglas' meadowsweet (*Spiraea douglasii*) and common horsetail (*Equisetum arvense*). Stunted black spruce (*Picea mariana*) and lodgepole pine are often present in nutrient-poor fens.

Upland grasslands and shrublands are rare on the landscape, other than immediately following forest removal and on shallow bedrock sites.

## Climate

The *Cordilleran Rainforest* zone occurs at low to mid-elevations in interior BC wherever incursions of mild wet Pacific air provide relatively high precipitation. In the northwestern portion of the zone, these air masses penetrate the Coast Mountains through the large valleys of the Nass, Skeena and Stikine Rivers. In southeastern BC, areas of high orographic

precipitation result when westerly air flows rise over the Columbia and Rocky Mountains. In general, summers are warm, winters are cool and annual precipitation is high.

Mean annual precipitation varies from approximately 700 to 1700 mm. Up to 50% of annual precipitation is snow, but rain can also occur during winter months. Snowmelt adds significantly to soil moisture. Summer precipitation is between approximately 300 and 550 mm throughout the zone and most sites do not experience a growing season moisture deficit. Mean annual temperatures vary from approximately 3.5° to 9° C, depending on latitude and elevation. Deep snowpacks and moderate winter temperatures prevent soils from freezing, which is important for the survival of western hemlock and western red cedar. The growing season averages between approximately 1200 and 2200 growing degree days above 5°C, depending mostly on latitude and elevation.

## Physiography, Geology, Topography and Soils

This zone occurs in southern and central portions of the Interior System of the Cordilleran physiographic region, and on the western side of the southern Rocky Mountains. In southeastern BC, it is found in valleys and on lower slopes of the Columbia Highlands, the Columbia Mountains, the southern Rocky Mountains and much of the adjacent Rocky Mountain Trench, from elevations as low as 400 mASL up to 1550 mASL. In northwestern BC, it occurs mostly in the Nass Basin and Skeena Mountains between 100 mASL and 1100 mASL.

The northwestern portion of the zone primarily comprises faulted and folded sedimentary rocks. The southeastern portion comprises mostly faulted and folded Paleozoic, Mesozoic or Tertiary sedimentary and metamorphic, often carbonate-rich, rocks. The terrain is a complex mixture of high mountains (up to 3000 mASL) with intervening plateaux, hill systems, valleys, trenches and basins.

The entire zone was affected by late Pleistocene glaciation. Glacial till covers most of the area, but valley bottoms also include glaciofluvial and recent fluvial materials. Steeper slopes and higher elevations often have colluvial deposits. Volcanic ash

often forms a thin upper soil layer in the southeastern portion of the zone. Mineral soils are commonly Podzols, Luvisols and Brunisols; Gleysols develop on moist, poorly drained sites.

## **Notes**

At low elevations in most locations, the *Cordilleran Rainforest* zone adjoins the *Cordilleran Subboreal Forest*; in some locations of southern BC, it adjoins the *Cordilleran Dry Forest*. At higher elevations, it is bounded by the *Cordilleran Montane Forest*. To the south, it continues into the United States.