

Pacific Dry Forest



General Description

The *Pacific Dry Forest* zone occurs at low elevations in the Georgia Depression of the southern British Columbia (BC) coast, where it covers an area of 1600 km². Rain shadow effects of the Olympic and Vancouver Island mountain ranges create a cool Mediterranean climate with relatively drier conditions than in nearby areas of the BC coast. Much of the area has been converted to agriculture and urban infrastructure, including the cities of Victoria, Duncan and Nanaimo, but the contemporary landscape still includes considerable cover by evergreen forests and woodlands.

Vegetation

Natural upland vegetation includes forests as well as woodlands. Generally, forests have closed, multi-layered canopies characterized by tall long-lived, evergreen coniferous trees. Stand structure becomes more open on drier sites and natural woodlands can occur. Dry site forests and woodlands often include sclerophyllous evergreen and/or cold-deciduous broad-leaved tree species. Canopy composition is usually of multiple conifer species, but conifer – broad-leaved mixes and pure broad-leaved compositions can occur. 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, perennial herbs and conifer regeneration. The moss layer is typically well developed under conifer canopies.

Stands have the potential to be hundreds of years old, but few old forests remain on the landscape. Historically, stand-replacing fire was the main natural disturbance factor but, since European settlement, other human-influenced disturbances now predominate. Most forests were harvested many years ago. Invasive non-native plant species exert a strong influence on vegetation composition and structure in much of the range.

Coast Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*) is the characteristic tree species, however other diagnostic trees include Pacific arbutus (*Arbutus menziesii*) and Garry oak (*Quercus garryana*). Western red cedar (*Thuja plicata*) and grand fir (*Abies grandis*) often co-occur with Douglas-fir on circum-mesic to moist sites. Red alder (*Alnus rubra*) and big-leaved maple (*Acer macrophyllum*) are common seral components of forests and are particularly abundant on moist sites. Shore pine (*Pinus contorta* var. *contorta*) occurs occasionally on some dry sites, as well as in bogs, where it can be dominant. Alluvial forests are dominated by red alder and black cottonwood (*Populus trichocarpa*).

The understory of conifer forests is typically dominated by evergreen broad-leaved shrubs, conifer regeneration and a well-developed moss layer. Common shrubs include ocean-spray (*Holodiscus discolor*), Cascade barberry (*Berberis nervosa*) and salal (*Gaultheria shallon*). Moist forests usually have a high cover of western sword fern (*Polystichum munitum*) and can also include salmonberry (*Rubus spectabilis*), Indian plum

(*Oemleria cerasiformis*), bracken fern (*Pteridium aquilinum*), vanilla-leaf (*Achlys triphylla*) and three-leaved foamflower (*Tiarella trifoliata*). The main moss species are Oregon beaked moss (*Kindbergia oregana*) and stairstep moss (*Hylocomium splendens*). Garry oak forests and woodlands have a rich understory dominated by camas (*Camassia* spp.) and other flowering herbs in the spring, and a variety of grasses later in the growing season.

Natural non-treed or sparsely vegetated communities, including wetlands, are uncommon on the contemporary landscape; most have been lost to urbanisation and agricultural conversion. Shallow marshes, shrub swamps and wetter fens usually are dominated by Sitka sedge (*Carex aquatilis* var. *dives*), sweet gale (*Myrica gale*), Douglas' meadowsweet (*Spiraea douglasii*) or broad-leaved cattail (*Typha latifolia*).

Coastal estuaries and intertidal zones have marshes and wet meadows dominated by Lyngbye's sedge (*Carex lyngbyei*), Beringian hairgrass (*Deschampsia cespitosa* ssp. *beringensis*), Virginia glasswort (*Salicornia depressa*), saltgrass (*Distichlis spicata*), arctic rush (*Juncus arcticus*) or sea ditchgrass (*Ruppia maritima*). Sparsely vegetated rocky shorelines and beaches/dunes occur in coastal areas.

Climate

The *Pacific Dry Forest* zone occurs at low elevations of coastal southern BC in the lee of the Olympic Mountains and the Vancouver Island Ranges. Rain shadow effects create relatively drier conditions within the generally maritime temperate macroclimate of coastal BC, resulting in a cool Mediterranean climate with moderately warm dry summers and mild wet winters.

Mean annual precipitation mostly varies between 650 and 1250 mm, significantly lower than that received by the surrounding *Pacific Maritime Rainforest* zone. The majority of total precipitation falls in autumn and winter months as rain; snow is

only a minor proportion. Mean annual temperatures are between approximately 8°C and 11° C, the lower values in wetter climatic areas. Growing degree days above 5°C average approximately 2200 throughout the zone. Frozen soils do not occur in winter, which is important for the survival of many of the coastal plant species.

Physiography, Geology, Topography and Soils

This zone occurs in the Georgia Depression, a lowland area lying between the Vancouver Island Ranges and the Pacific Ranges of the Coast Mountains. Elevations are mostly between sea level and approximately 150 mASL. The geology of the Georgia Depression is mostly folded and faulted volcanic and sedimentary rocks.

The area has been glaciated numerous times and the most prevalent parent material is glacial till, although marine clay is also common due to post-glacial isostatic recovery. An extensive area of fluvial outwash occurs on the lower Fraser River valley, although it is now mostly agricultural land. In dissected hilly terrain, colluvium is also common, often with bedrock exposures. Parent material textures vary considerably, although the tills are mostly medium-textured with moderate to high coarse fragment content. Mineral soils are mostly Brunisols, but in areas of higher precipitation Podzols can develop.

Notes

The *Pacific Dry Forest* zone occurs from the Pacific coast inland to the *Pacific Maritime Rainforest*. The southern boundary is the international border; similar ecological conditions occur in the adjacent United States.