An aerial photograph of a mountainous landscape. In the foreground, a winding river flows through a lush green valley. The middle ground is dominated by a dense forest of evergreen trees. In the background, rugged, rocky mountain peaks rise against a cloudy sky. The overall scene is a typical representation of a boreal forest environment.

The Ecology of the Boreal White and Black Spruce Zone

The Boreal White and Black Spruce Zone forms part of a vast boreal forest that stretches across northern Canada from Newfoundland to the Yukon. In many ways, this zone fits the popular image of the Canadian north as a place with large areas of unspoiled wilderness, long cold winters, and abundant wildlife. Forests and muskeg dominate the landscape, and moose, caribou, bears, and wolves are plentiful, along with black flies and mosquitoes.



Location

The Boreal White and Black Spruce Zone covers most of the Alberta Plateau in British Columbia's north-east, as well as lower elevations in the central north, and west to the Tatshenshini. One of the largest ecological zones in British Columbia, the Boreal White and Black Spruce Zone covers about 10 percent of the province's total land area. It includes



the communities of Fort St. John, Fort Nelson, Telegraph Creek, Dease Lake, and Atlin.



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Fire and Forest Succession

During the warm summer months wildfires are frequent here, especially in the drier areas. Usually started by lightning, these fires are often intense enough to kill most of the trees over a large area. This triggers a process of forest succession where the burned site is quickly occupied by plants well adapted to surviving fires or to recolonizing burned over habitats.

The first plants to grow back after fires are often herbs, shrubs, and deciduous trees such as aspen and willow. Although these plants may dominate the region for a long time, conifers such as white spruce and black spruce often overtake them. In other places, conifers such as lodgepole pine and black spruce may reseed



John Pammiter



John Pammiter

Unalaska paintbrush
Castilleja unalaschcensis

and dominate an area directly after a fire, bypassing the deciduous stage.

Because upland forests have many fires, the landscape is a mosaic of forest stands of various types and ages.

Climate and Terrain

Winters in this zone are long and extremely cold. The summer growing season is warm, but short. The zone receives relatively little precipitation and the least snowfall of all northern zones. Pockets of permafrost (permanently frozen ground) are common in peatlands in the northern areas. Trees and most other plants grow slowly in the cold climate and dead plants decompose slowly.

The topography of the zone varies from the mostly flat and low-lying Alberta Plateau in the northeast, to the rolling Rocky Mountain foothills and the rugged mountains of British Columbia's northwest.



Ecosystems

The Boreal White and Black Spruce Zone is a mixture of two main ecosystems: upland forests and muskeg. Upland forests are most common in better-drained parts of the Alberta Plateau in the east and in mountainous parts of the zone in the west. Muskeg is most extensive on the poorly-drained northeastern lowlands.

The zone contains several different upland forest types. The most common types are mixed stands of trembling aspen and white spruce and mixed stands of lodgepole pine and black spruce. Open lodgepole pine and lichen forests occupy drier sites, whereas wetter sites give rise to communities of dense black spruce and moss. White spruce and balsam poplar flourish in rich, well-drained river bottoms, which contain the most productive forests of the zone.

Bill Swan



The term “muskeg” describes the peatland combination of bogs and nutrient-poor fens that cover extensive parts of northeast British Columbia. The most common trees in this ecosystem are stunted black spruce and tamarack. Muskeg occurs over deep layers of peat, and permafrost can be found here. The Boreal White and Black Spruce Zone contains several other minor but important ecosystems: in the northeast, nutrient-rich swamps and fens are dominated by tamarack, sedges, and brown mosses; boreal grassland and scrub communities occupy steep, south-facing slopes; and small but productive marsh and shallow-lake ecosystems are found throughout the zone.



Richard Mahzems



Labrador tea
Ledum groenlandicum

Bill Swan

Wildlife

The Boreal White and Black Spruce Zone is rich in wildlife, especially ungulates. Moose, caribou, and mule deer are common and widespread. White-tailed deer are abundant east of the Rockies, and Rocky Mountain elk, Stone sheep, and mountain goats inhabit the rugged terrain of the Rockies and further west. This zone also supports abundant populations of black bear, grizzly bear, and grey wolf.

Birds and small mammals are common everywhere in the zone, but they do especially well in the deciduous forests that follow fire. Waterfowl inhabit marshes and shallow-lake habitats. Because of the cold climate, there are few amphibians and reptiles; they live mainly in the warmer valley bottoms. One amphibian species, the striped chorus frog, lives only in the wetlands of the Alberta Plateau.



Jacobs Walker

Caribou
Rangifer tarandus



Jim Poir

Rocky Mountain elk
Cervus elaphus nelsoni

The Wood Bison

Before 1800, an estimated 168 000 wood bison roamed northern Saskatchewan and Alberta, the southwestern part of the Northwest Territories, and northeastern British Columbia. By 1900, hunting had reduced the total number of bison to just 250. In 1963, a wild herd was established in the MacKenzie Bison Sanctuary. It now numbers around 1700 animals, but the wood bison remains an endangered species. In British Columbia, wood bison were once common near Atlin and in the Liard and Petitot valleys. Today, they number only a couple of hundred, as a result of a reintroduction program and natural migration from the Northwest Territories and Alberta.



Richard Kitzens

Wood bison
Bison bison athabasca

Resources

Hunting, fishing, and trapping are important pursuits in many parts of the Boreal White and Black Spruce Zone. The zone has relatively low potential for forestry, with floodplains, moist sites, and south-facing dry slopes producing the most timber. However with mills using more hardwoods such as trembling aspen and balsam poplar, logging in this zone has recently increased.

The primary industry of the Alberta Plateau is oil and gas extraction and exploration. Ranching and grain production are major economic activities in the southern part of the Peace River region. Although this is the only agricultural area within the zone, the Peace River Valley near Fort St. John contains some of British Columbia's richest farmland.



Richard Kobzev

Grassland and Scrub Ecosystems

Boreal grassland and scrub ecosystems occur on steep, south-facing slopes above some of the major rivers in the Boreal White and Black Spruce Zone. Although these dry ecosystems usually cover only small areas, they are an important part of the northern landscape.

They contain plant species that grow nowhere else in British Columbia and provide important wildlife habitat. Mule deer, Rocky Mountain elk, Stone and Dall sheep, and mountain goats forage here in winter because the snow is shallower than in other areas. In summer, berry patches attract birds and bears to these areas.

The Peace River Valley and the Grand Canyon of the Stikine contain some of the most interesting examples of boreal grassland and scrub communities in the province. Agriculture, grazing, oil and gas drilling, and hydroelectric projects have endangered many of these fragile ecosystems.



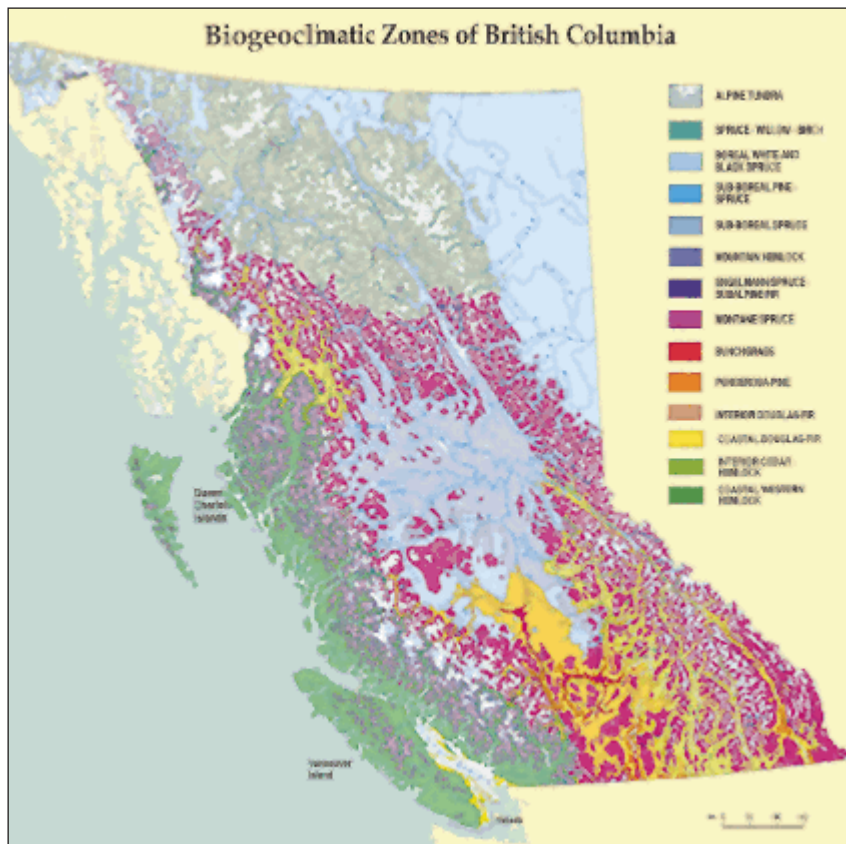
Richard Kobzev



Bill Swan

Highbush-cranberry
Viburnum edule





The Boreal White and Black Spruce Zone is just one of the fourteen biogeoclimatic or ecological zones within British Columbia. These zones are large geographic areas that share a similar climate within the province. Brochures in this series explore each zone.



Ministry of Forests

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