

Bog Ecology

A bog is a type of wetland with soil composed of partially decomposed organic material known as peat. On the surface grow hummocks of wet *Sphagnum* moss and various hardy plants that are able to tolerate the cool and wet acidic peat soils. Many of these plants are "left-overs" from a time when this was an Arctic climate.

Living *Sphagnum* plants are only a few centimetres tall, but may remain connected to non-living parts of the plant hundreds of years old extending metres underground. *Sphagnum*-dominated bogs develop under cool, wet climatic conditions in areas where rainwater accumulates, but which receive little or no inflow of waterborne nutrients.

The Lulu Island Bog and its Vegetation

The Richmond Nature Park contains the largest undeveloped remnant of the Greater Lulu Island Bog, which once covered most of east-central Lulu Island Bogs first developed at the eastern end of Lulu Island, on land formed long ago from silt and debris deposited at what was then the mouth of the Fraser River. Before achieving its current raised peat stage, the Lulu Island bog went through salt marsh, sedge and heath stages as deposition from the Fraser River caused the island to expand westward and the course of the river became farther removed.



There may be numerous species of *Sphagnum* moss within a bog, each with its own preferred set of environmental conditions. Seven species have been identified in the Richmond Nature Park. Species of *Sphagnum* can absorb almost 30 times their mass in water, and they secrete acid to aid in the absorption of scarce nutrients. For other plants to survive in the bog, they must be able to tolerate a high water table, poor levels of soil nutrients, and low pH.

Many of the most conspicuous flowering plants found in bogs are heaths (Family *Ericaceae*). Common examples in the Richmond Nature Park are Labrador tea (*Rhododendron groenlandicum*), bog laurel (*Kalmia microphylla*), bog rosemary (*Andromeda polifolia*), and native species of blueberries and cranberry (*Vaccinium species*). Elsewhere, heaths grow in other harsh, low-nutrient climates, especially in higher elevations and latitudes.



Another plant more typical of cold climates is cloudberry (*Rubus chamaemorus*), a relative of blackberries and raspberries. It is a relict from the last cool, post-glacial period and finds refuge in bogs where plants of temperate climates cannot compete. The Richmond Nature Park is one of few sites in the lower mainland of British Columbia where this species occurs.



A tree characteristic of bogs, in small stands or extensive forests, is the Shore Pine (*Pinus contorta*). This conifer can tolerate the poor soils, yet may have a stunted or spindly appearance.

Carnivorous plants are also characteristic of bogs. They compensate for the lack of nutrients in the soil by trapping and digesting small insects. The round-leaved sundew, *Drosera rotundifolia*, which traps insects on the sticky ends of hairs extending from its leaves, occurs in a few of the wettest areas of the Richmond Nature Park. .



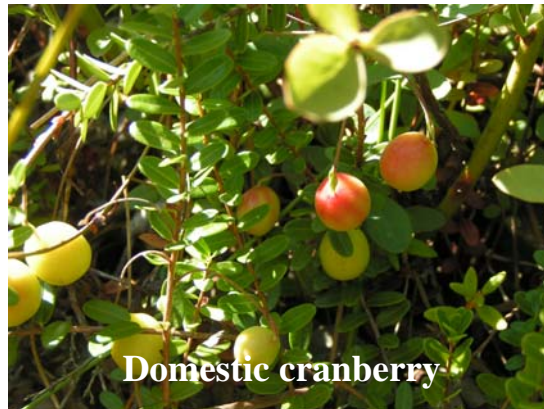
Round-leaved Sundew

Changes in the Bog

Agricultural and urban developments in Richmond have swallowed up most of the Lulu Island Bog. The remaining morsel that is the Nature Park has also been changed by human activities. The ditches dug around its perimeter artificially lower the water table in adjacent areas and, especially during summer months, reduce the growth of *Sphagnum*, thus affecting the distribution of other plants. On

either side of Highway 99, which bisects the park, fill has been added to the bog, and the nutrients within it have supported the growth of a dense birch forest. Other plants not typical of bogs have also colonized the fill, including western hemlock (*Tsuga heterophylla*), red elderberry (*Sambucus racemosa*), cascara (*Rhamnus purshiana*), salal (*Gaultheria shallon*), several *Rubus* species, and sword fern (*Polystichum munitum*).

Commercially grown cranberries and domestic blueberries (*Vaccinium macrocarpon*, *V. corymbosum*), pre-adapted to life in acid soils, have been spread throughout the park in bird dropping s. Domestic blueberry poses a serious threat to native species. It grows as a high bush, and if allowed to spread unchecked will shade out most of the native bog species. In some areas of the park, most notably a broad east-west band bordering Westminster Highway, domestic blueberries are the dominant vascular plant in the shrub layer.



Domestic cranberry



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