

H5.1 BARREN

The barren habitat is a rocky heathland with dwarf shrub and lichen vegetation that occurs in Nova Scotia along the Atlantic coast as well as inland.

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Plate H5.1.2: West Dover Barrens, Halifax County (Unit 851). Glacial erratics dominate the open landscape, which supports stunted spruce trees (krummholz) and sparse heath vegetation. Exposed bedrock at the edge of the barrens grades into rocky-shore habitat (H2.1). Photo: R. Merrick

FORMATION

Four factors may be involved in the development of barrens:

1. the effects of ice action during glaciation scraping over hard rocks and leaving only a thin residue of coarse till with numerous boulders;
2. the formation of a hardpan layer (ortstein) which is impenetrable to roots;
3. the effects of fire, stripping humus from the soils. Repeated deep burns appear to favour the development of lichen dominated barrens;
4. rigorous climatic conditions.

The extensive barrens of southwest Nova Scotia (District 440 and Unit 452) show evidence of repeated burning. In many areas, especially in District 440, the presence of a hardpan may prevent any natural recolonization by trees. Hardpans are also found in Cape Breton Highlands (Region 100). The coastal barrens tend to have just a thin, patchy soil cover over bedrock. In many cases the relative importance of fire is not certain—pollen studies in south-western Nova Scotia suggest that a shift towards shrub vegetation may have started long before European settlement in response to climatic deterioration. Harsh climatic conditions are the greatest influence on some of the Cape Breton high altitude barrens and coastal barrens on exposed headlands.

PHYSICAL ASPECTS

1. *Bedrock*: usually granites, quartzites and schists.
2. *Soils*: thin, coarse, gravelly till over compacted material or bedrock; low moisture-holding capacity; strongly acidic.
3. *Relief*: only moderate changes in elevation—rolling hills, flat areas, ridges (especially over quartzite) and knolls.
4. *Drainage*: usually associated with irregular, sluggish, meandering streams, with peat accumulation and oligotrophic-bog formation in depressions.

ECOSYSTEM

Barrens are essentially impoverished habitats, with low nutrient availability and low floral diversity, offering a comparatively small number of niches.

SUCCESSIONAL SEQUENCE

The present successional status of barrens may depend largely on the role of fire in their development (which cannot always be determined). On many sites, the shrub–lichen vegetation may represent the climax stage as related to the existing soil conditions. Change would come about only very slowly as a result of soil development. On other sites, if fire does not intervene, some form of dwarf Black Spruce forest cover may eventually develop.

PLANTS

Barren conditions favour ericaceous (heath) vegetation and lichens. Ericaceous plants are usually woody, acid-tolerant and very resistant to drought. Lichens are a pioneer vegetation type, in this case colonizing exposed rock. They can also survive very dry conditions.

Coastal barrens:

(Region 800, especially District 850)

Reindeer Moss (*Cladonia spp.*), Broom Crowberry or Black Crowberry

Highland barrens: (Region 100)

Reindeer Moss (*Cladonia rangiferina*), *Cladonia alpestris*, Sheep-Laurel, Rhodora, Blueberry, Black Crowberry, Labrador Tea

Inland barrens: (District 440, Units 452 and 413)

Broom Crowberry, Huckleberry, Blueberry, Sheep Laurel, Reindeer Moss, Bearberry, Rhodora

On all barrens, some stunted trees may be found, usually Black Spruce or Larch. In southwestern Nova Scotia, there may also be relict White or Red pines; in Cape Breton, Balsam Fir may be found.

ANIMALS

The low diversity of plant types and the harsh, dry conditions of the barren do not provide productive habitat for animals. The soil fauna is poor, and those animals that do occur are largely found in protected situations, such as rock crevices. Pyralid moths are important, and their larvae are common on the low vegetation.

The American Toad, Northern Redbelly Snake and Maritime Garter Snake commonly occur. The only bird species frequently nesting in the inland barrens are the Nashville Warbler and Common Yellowthroat. Such seabirds as Storm-petrel nest

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on coastal barrens, particularly on islands. The only mammals that commonly occur are the Cinerous Shrew and Meadow Vole. Other types of birds and mammals, including Moose and Black Bear, will visit barrens from adjacent habitats, particularly during the Blueberry season.

SPECIAL FEATURES

- *Hummock development*: successive layers of lichens growing up through shrubs, smothering the branches, gradually build up hummocks composed entirely of incompletely decomposed humus.
- *Krummholz*: stunted tree growth results from harsh climatic exposure. Trees exhibit dense, lateral branching.
- *Polygonal patterns (southwestern Nova Scotia)*: Lines of small boulders occur, having been preferentially sorted in late glacial and immediate post-glacial time by freezing and thawing.

DISTRIBUTION IN NOVA SCOTIA

Major coastal barrens are found in Halifax County and Guysborough County (District 850). Other large barren systems occur on the plateau surface of the Cape Breton highlands, to the east of the Liscomb Game Sanctuary (Unit 413b), Shelburne County (Unit 452) and the Tobeatic Game Sanctuary (District 440).



Associated Topics

T10.2 Successional Trends in Vegetation, T10.4 Plant Communities in Nova Scotia, T10.5 Seed-bearing Plants, T10.11 Lichens, T11.9 Carnivores

Associated Habitats

H4.1 Bog

Additional Reading

- Eastern Ecological Research (1978) *Cape Breton Highlands National Park: Ecological Land Classification*. Parks Canada.
- Martin, J.L. (1956) "An ecological survey of burned-over forest land in southwestern Nova Scotia." *Forestry Chronicle* 32.
- Martin, J.L. (1959) "The birth of a barren." *J. Educ.* (Halifax, N.S.).
- Nichols, G.E. (1918) "Vegetation of northern Cape Breton." *Trans. Conn. Acad. of Arts Sci.* 22.
- Strang, R.M. (1969) *Ecology and afforestation: A study on the barrens of southwestern Nova Scotia*. (unpublished). *Forestry Chronicle* 32(3). Canadian Forestry Service.

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