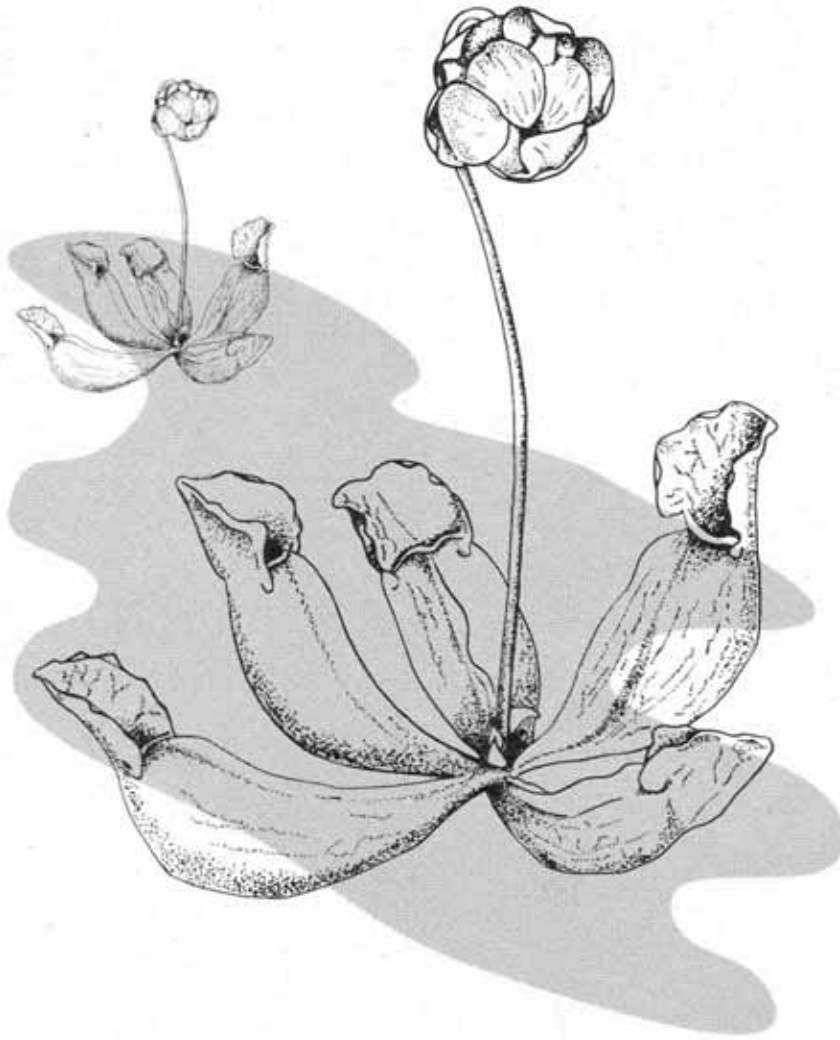


Discovering *the* **BOG**



ECODISCOVERY Series

WHAT IS A BOG?

BOGS, FENS, MARSHES, and swamps are soggy wet areas that are neither firm lands nor bodies of open water. Collectively they constitute wetland habitat that covers approximately 14% of Canada and is home to a diverse range of plants and animals.

Bogs are peat-covered or peat-filled wetlands characterised by a cover of knee high evergreen shrubs growing in light green moss. Slow decomposition of moss and aquatic vegetation in a wet environment creates peat, the basic building material of a bog. Of the vari-

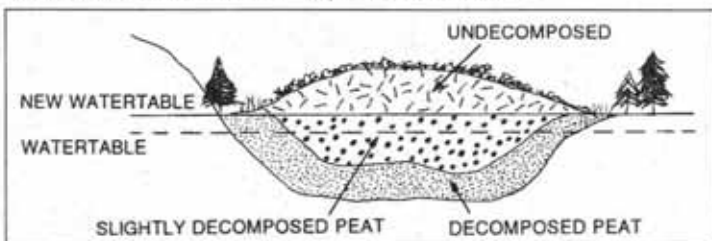
ous types of wetland habitat, bogs are the most deficient in nutrients and the most poorly drained. *Sphagnum* moss, the dominant plant of a bog, thrives in such an environment, often blanketing an entire bog. *Sphagnum* is responsible for creating the characteristic floating peat mats ("quaking" bogs) and the cool acidic waters we associate with bogs.

DEVELOPMENT OF A BOG

In Nova Scotia, bogs generally occupy shallow basins between mounds of earth deposited by the glaciers as they retreated 10 - 12,000 years ago. These bogs start as small ponds or shallow lakes and gradually fill with aquatic vegetation. Several species of peat-forming mosses and bulrushes thrive in such damp and poorly drained conditions. In an environment that is cool, wet and low in oxygen, more plants are produced than are decomposed. Consequently, undecomposed plant matter accumulates, and over time the level of the bog's solid surface moves gradually upwards, eventually rising above water level.

Bogs pass through an initial 'wet' stage and then a 'dry'

stage. The surface of wet bogs is constantly waterlogged. Cushion-forming mosses, the variety of *Sphagnum* present in a wet bog, pull their water supply upwards with them as they grow. As the mosses continue growing and building peat, raised domes or 'hummocks' — typical of many of Nova Scotia's bogs — develop. The progressive upward growth of hummocks further dries and compacts the bog, thereby enabling some dwarf trees and, later, lichens to become established. Once lichen colonies are securely established the bog has matured and its surface stabilizes. The eventual appearance of trees signifies the final stages of a bog's transition from water to land.



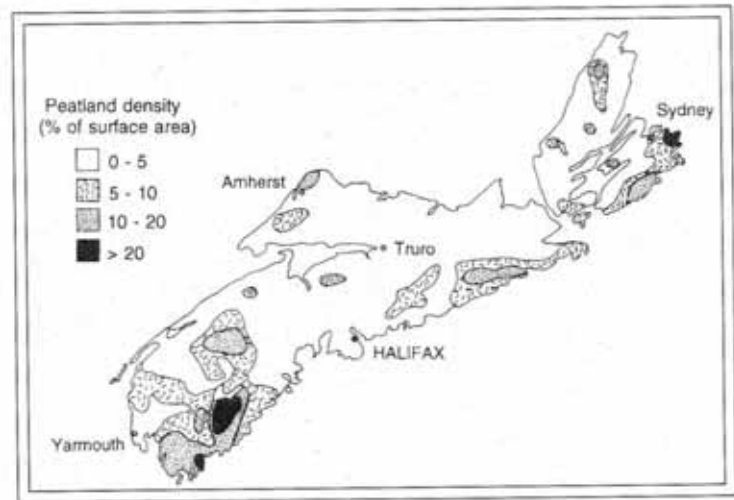
Profile of an open raised bog showing the layers of moss and peat.

ENVIRONMENTAL ROLE OF BOGS

In addition to contributing to our planet's biodiversity, bogs serve an important role in our environment's wellbeing. Bogs are natural filters for our fresh water. Mosses and other bog plants extract heavy metals and pollutants from groundwater and bind these contaminants within their organic mat. Bogs also absorb atmospheric heat, and store carbon which would otherwise be free to circulate

in the earth's atmosphere. Both of these actions combat the rise of global warming or 'greenhouse effect'.

Really, there's more than meets the eye when it comes to bogs. The bog is an important habitat, and a necessary part of our ecosystem. They're not just soggy, bug infested places; bogs convert water to land and keep our waters pure - no mean feat!



Distributions of peat-lands in Nova Scotia.

DISCOVERING THE BOG

Bogs are located throughout Nova Scotia. Some regions more rich in boglands include:

- *Baccaro, Shelburne Co.*
- *The southern shores of Lake Rossignol, Queens Co.*
- *Aylesford, Kings Co.*
- *Falmouth ('Shaws Bog'), Hants Co.*
- *Canso, Guysborough Co.*
- *Pleasant Bay (Cape Breton Highlands National Park), Inverness Co.*

When planning to hike around bogs, be mindful that you are almost walking on water: use suitable footwear, be cautious, and tread lightly on the delicate mossy carpet.

LIFE IN THE BOG

The assortment of unusual plants you can discover in a bog is distinctive. Most apparent is the *Sphagnum* moss, living and dead, growing everywhere. Various orchids, including the Grass Pink, Rose Pogonia and Tall White Bog Orchid, find refuge in the bog. Dwarf Black Spruce and Larch surround the margin, and shrubby plants — Cranberry, Leatherleaf, Huckleberry, and Labrador Tea — carpet the bog's perimeter. The leaves of most bog shrubs are thick and leathery with turned down edges, a feature which, curiously enough, also appears on desert plants. Ironically, certain bog plants have developed mechanisms for retaining water despite living in a waterlogged habitat. But the bog is actually a desert — a region devoid of nutrients. Bog-dwelling plants have adapted to life in a nutrient desert by restricting evaporation from leaves to reduce mineral losses.

Other bog plants have adapted to the lack of nutrients by becoming carnivorous. The Pitcher plant, Sundew, and Bladderwort obtain essential nutrients from the bodies of insects. In the case of the Pitcher plant, victims are lured down into the plant by an attractive secretion around the rim of the pitcher. Stiff, downward-pointing hairs then draw unwary insects further inside the trap until they tumble into a watery reservoir below where victims are slowly digested by enzymes.

The acidity and low productivity of bogs make them unattractive to most animals. Many species of birds and mammals visit bogs, but few actually live there. Sparrows, warblers, shrews, muskrat, hares, Black bears, deer, and moose frequent bogs. In turn, the bog is home to salamanders, frogs, turtles and insects. Early summer visitors to bogs will also surely be greeted by swarms of blackflies and mosquitos.



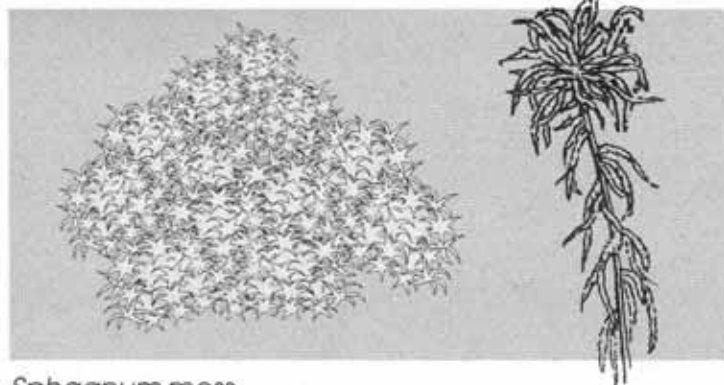
Cross-section of a Pitcher plant leaf (*Sarracenia purpurea*)

SPOTLIGHT ON SPHAGNUM

Sphagnum provides the building blocks for a bog, and the actions and properties of *Sphagnum* create the bog's cool, acidic conditions. *Sphagnum* is nature's super sponge, capable of absorbing 22 times its dry weight in water. The secret of its absorptive marvels rests in its leaves. The leaves of *Sphagnum* are composed of small 'green' cells and much larger 'support' cells. Green cells capture energy from the sun while the large support cells

absorb water and provide structure for the plant.

Sphagnum's remarkable capacity to retain water has made it a popular soil conditioner among horticulturalists and gardeners. Some European countries use dried peat for homeheating and to fuel energy generators. Presently, peat is harvested commercially on a small scale throughout the Atlantic provinces for use in horticulture.



Sphagnum moss

UNIQUENESS AND FRAGILITY OF BOG HABITATS

The local climate of Nova Scotia's bogs is much like that of more northerly regions; bogs remain cooler than their surroundings because of the insulative properties of peat. The thick mats of peat covering most bogs effectively shield underlying layers from the sun's heat, so well in fact that some sections of a bog may remain frozen throughout summer. Excessive evaporation from a bog's wet mossy surface during hot weather also has a cooling effect. Consequently, flora and fauna typical of more northerly areas and unusual to Nova Scotia colonise the area around the province's bogs.

In many ways bogs are islands of low quality habitat. Organisms living in bogs have adapted to an environment that is nutrient-poor, acidic, cool and wet. Disturbances to a bog can easily upset the balance to which organisms have become adapted. For instance, walking over a bog changes the pH, temperature, water saturation level, and oxygen content of the areas that have been compressed. However, though we recognise the fragility of bogs, we still don't fully understand how such disturbances affect the plants and animals over the long term.



A raised bog in Halifax Co. with developing Black spruce and Larch forest.



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