

Wild about PEATLANDS



In the past, peatlands were considered soggy, barren wastelands. But to those who learn more about them, they become beautiful, unusual, fascinating and complex ecosystems.

Peatlands are different from other wetlands because of the buildup of layers of peat. It is made up of the dead and decomposing Sphagnum mosses and the many other wetland plants over which new, living plants have grown. It is typically several metres deep; it can even exceed 10 metres in some locations! Since peat is very absorbent, it acts like a compact sponge saturated with water. This keeps water levels in peatlands high, maintaining wet conditions in the habitat as well as providing water storage that may reduce downstream flooding or be slowly released in times of drought. Peat can also absorb heavy metals and other contaminants, nutrients and sediments, and so it can clean up contaminated water.

Peat creates the unique conditions found in these wetlands. Decaying peat makes peatland water acidic, nearly as much as vinegar. Also, the water has low levels of oxygen and nutrients. These conditions, added to the low soil temperatures of northern latitudes, make decomposition a very slow and difficult process below the surface. Many decomposing microorganisms lack much of what they need to survive in the peat layers, so instead of quickly decomposing when it dies, the moss accumulates as new moss grows at the top. Some peatlands have been forming since the end of the last Ice Age. This accumulation is made of 40 per cent carbon. So instead of being released in the atmosphere as carbon dioxide, carbon is stored in the peatland. This is why they are important regulators of climate change.

Globally, peatlands occupy three to four per cent of the land surface, approximately 4 million square kilometres. In Canada, fens and bogs (two types of peatlands) occur throughout the country but are more common in northern areas. They cover about 170 million hectares of our country, about 14 per cent of the total surface of Canada. Also called "muskegs" (an Indigenous term for "soggy ground"), peatlands are the most extensive wetlands in our boreal forest.

PLANTS AND FUNGI

The most dominant and widespread peat-forming species in peatland ecosystems are *Sphagnum* mosses. They are keystone species, meaning that they modify their environment. There are roughly 120 species of *Sphagnum* mosses worldwide. Like most mosses, *Sphagnum* mosses are soft, small plants with short leaves. Mosses typically grow in humid environments. Since they do not have roots to gain water with, they absorb their water through their leaves. They can hold a lot of water in their tissues, like a sponge, which helps them survive in drier periods. *Sphagnum* mosses grow in mats, submerged or floating over water, which can often withstand the weight of a large moose! Other moss species may also grow in a peatland, such as Neon Moss.

The layers of peat and live mosses form a substrate in which other plants may grow. Because of the low levels of nutrients and oxygen, plant diversity is often restricted to specialized species. Plants that grow in peatlands must adapt to thrive in their unusual conditions – for example, nodules with bacteria or fungi in their roots help gather and keep nutrient reserves. Plant species such as the Common Cotton Grass, Small Cranberry, Bog Laurel, Leatherleaf, Velvet-leaved Blueberry and Bog Labrador Tea are common. Other plants found in peatlands include rhododendrons and orchids, such as the Pink Lady's Slipper, Grass Pink Orchid, Bog Candle and Dragon's Mouth. In the open-water areas of peatlands, Common Cattails, Yellow Pond Lilies and a few other water plants can grow.

Most peatlands contain carnivorous plants. These plants, like bladderworts, sundews (like the Round-leaved Sundew), and pitcher plants (such as the Purple Pitcher Plant), can compensate for the lack of nutrients in the soil by capturing small insects and spiders. They are attracted by the sweet sticky liquid on or contained by their leaves and get stuck when they touch it. When it has captured a prey, the plant produces digestive liquids and absorbs the dissolved insect remains through its leaves.

Trees can grow in peatlands, but only where their roots can stay out of the water long enough for them to survive. The most common trees include Bog Willow, Black Spruce, Tamarack, Swamp Birch and Grey and White Birch. Many stay small because of the low amount of available nutrients and oxygen, high water levels and wind exposure. More than 600 species of fungi have been inventoried in bogs and fens in the Northern Hemisphere. Most are microfungi, or very small fungi, like those found in lichens (such as the Oakmoss Lichen), but some species can be seen at the surface as mushrooms, including the Moss Bonnet.

WILDLIFE

Fish

Small fish, like the Central Mudminnow, have been observed in open-water areas of peatlands, but unlike other wetlands, fish diversity is not large because of the water conditions.

Birds

Peatlands provide habitat to millions of songbirds, raptors and waterfowl, mostly migrators mating or visiting them in the summer. A few species, like the Yellow Palm Warbler and the Lincoln's Sparrow, heavily rely on peatlands, having adapted perfectly to these unique ecosystems. Common wetland birds, such as the Red-winged Blackbird, can be observed in the cattails. Birds of prey, including the Red-tailed Hawk, can be seen hunting over the open areas. Peatlands are great habitat for Tree Swallows, which can feast on the great quantities of flying insects. Northern Harriers nest in the tall grasses. Forest-living Spruce Grouse may prefer these open habitats sheltered from most predators during the summer months. Shorebirds, geese and ducks, including the Black Duck and the Solitary Sandpiper, can be seen near or on open-water areas of peatlands. Also, larger peatlands are important to some birds like the Savannah Sparrow and the rare Upland Sandpiper.

Mammals

Some large mammals can be found in peatlands. Moose, White-tailed Deer, Wood Bison and Caribou pass through areas where moss mats are thick and strong enough to withstand their weight. Some herds of Woodland Caribou choose peatlands specifically as their winter habitat, since they forage on the many species of lichens found there. Black Bears, wolves, Bobcats and Canada Lynxes can also be observed visiting peatlands in search of food.

Smaller mammals are more common and diverse than larger ones. Lemmings, voles, mice, Snowshoe Hares, Minks, shrews, Muskrats and Red Squirrels find food and shelter in peatlands. Not many small mammals live predominantly in peatlands throughout their lives, but the Northern Bog Lemming, Southern Bog Lemming and Arctic Shrew prefer them to other habitats. Beavers are also common in peatlands, and they have been known to alter and flood them.

Reptiles and Amphibians

Because of peatlands' unusual conditions, they are home to fewer amphibians than other types of wetlands. Given the high water acidity, few species breed successfully in bog water, with the exception of Green Frogs and Wood Frogs. However, other species can occur in peatlands: the Leopard Frog, Mink Frog, American Toad, Spring Peeper, Spotted Salamander and Blue-spotted Salamander.

Because many peatlands are in colder areas, reptile diversity is very low. Still, Spotted Turtles and Eastern Garter Snakes are often found there. In some areas, the Eastern Massasauga and the Smooth Greensnake live in peatlands.

Invertebrates

Within the layers of peat, microfauna adapted to low oxygen levels – bacteria, protists, etc. – work at decomposing the dead *Sphagnum* moss. But because of the unusual water conditions, peatlands have much less diversity of such microfauna than other wetlands.

Insects are often the first group of wildlife one will come across when someone is visiting a peatland. An estimated 6,000 species of aquatic and terrestrial arthropods – invertebrates with an outer skeleton – may be found in peatlands. This includes flies, mosquitoes, dragonflies (including the Muskeg Emerald), damselflies, bees (such as the Tri-coloured Bumblebee), wasps, beetles and spiders. Experts think that about one per cent of these species only live in peatlands, like the Bog Fritillary butterfly.

DISTURBANCES AND THREATS

Even if most peatlands in Canada's North are remote and inaccessible, many have been flooded because of hydroelectricity developments or damaged from the forestry and mining industries. In the more heavily populated south, many peatlands have been almost completely drained and destroyed to make way for farms, and some are still under threat of urban development. Several peatlands are currently being threatened by cranberry farming, which involves flooding or draining, and by peat mining. Because of these threats, some species inhabiting Canada's peatlands are now at risk. These species include the Woodland Caribou, Thread-leaved Sundew, Eastern Ribbon Snake, Spotted Turtle, Massasauga rattlesnake and many others.

Wildlife

- A Beaver lodge
- B Tri-coloured Bumblebee
- C Black Duck
- D Blue-spotted Salamander
- E Bog Fritillary
- F Canada Lynx
- G Central Mudminnow
- H Northern Bog Lemming
- I Leopard Frog
- J Lincoln's Sparrow
- K Moose
- L Muskeg Emerald
- M Red-tailed Hawk
- N Red-winged Blackbird
- O Spotted Turtle
- P Yellow Palm Warbler

Plants and Fungi

- 1 Sphagnum Moss
- 2 Black Spruce
- 3 Bog Candle
- 4 Bog Laurel
- 5 Bog Willow
- 6 Common Cattails
- 7 Common Cotton Grass
- 8 Dragon's Mouth
- 9 Grass Pink Orchid
- 10 Labrador Tea
- 11 Cladonia Lichen
- 12 Bonnet Mycena
- 13 Star Moss
- 14 Oakmoss Lichen
- 15 Pink Lady's Slipper
- 16 Purple Pitcher Plant
- 17 Round-leaved Sundew
- 18 Swamp Birch
- 19 Tamarack
- 20 Velvet-leaved Blueberry
- 21 Yellow Pond-lily

To find out more about peatlands, please visit Hinterland Who's Who at HWW.ca!

HINTERLAND WHO'S WHO



350 Michael Cowpland Drive, Kanata, ON K2M 2W1
1.800.563.9453 | CanadianWildlifeFederation.ca

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Text: Annie Longleis
Copy Editing: April Overall
Creative Design: Sandra Williams