

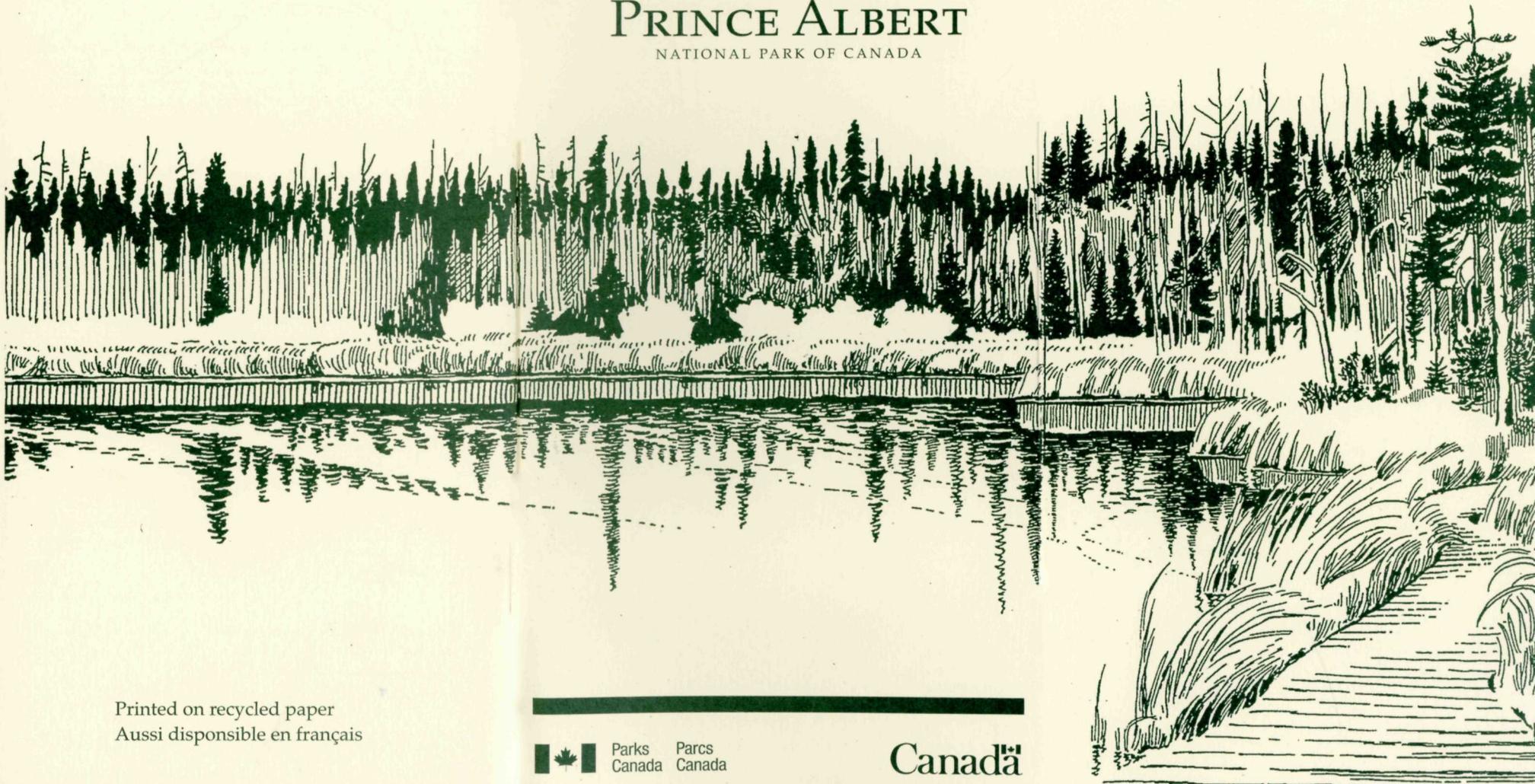


BOUNDARY BOG

NATURE TRAIL

PRINCE ALBERT

NATIONAL PARK OF CANADA

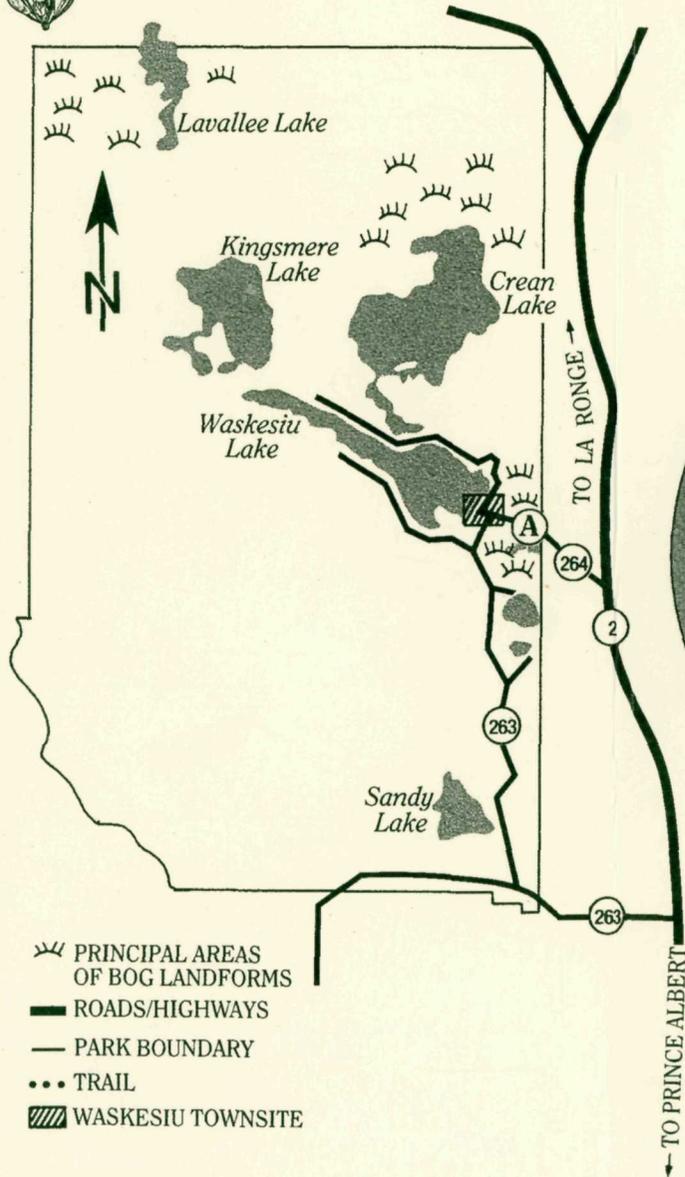


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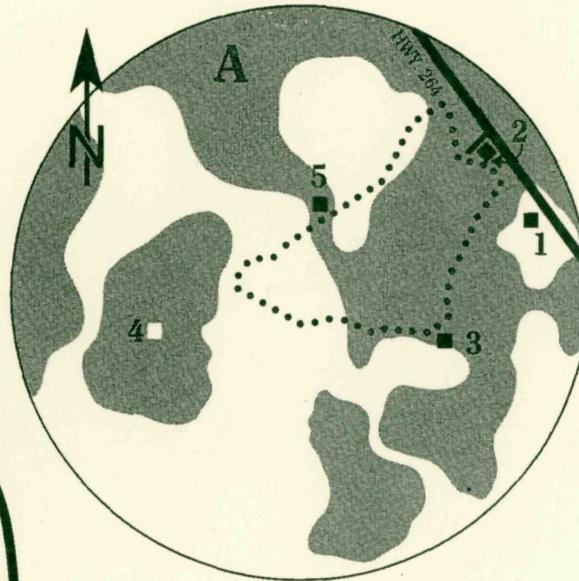


Parks Canada
Parcs Canada

Canada



- 1 EAST GATE
- 2 PARKING
- 3 RENDEZVOUS RIDGE
- 4 BOUNDARY BOG LAKE (eye of the bog)
- 5 LOOKOUT TOWER



On **Boundary Bog Nature Trail** you enter a part of the wild rarely explored; the heart of a black spruce bog. Your adventure starts just inside the East Gate of Prince Albert National Park, on Highway 264, five kilometres from Waskesiu Lake townsite. Strolling for about an hour and a half along this 2 kilometre trail, you'll discover some of the unique features that make it unlike any other nature trail in the park.

A boardwalk through the bog helps protect the fragile mosses and keeps your feet dry, so no special footwear is required. Depending on the season, you may need to be prepared for some 'bugs'.

Follow the path and use this guide. The signs along the way will tell you when to refer to the text. Titles are matched with the guide.

Relax and take your time
Enjoy your walk.



Towards The Bog



Over this rise and through a forest patchwork about $\frac{3}{4}$ of a kilometre from where you are standing lies Boundary Bog.

Bog, Muskeg, Peatland. What images do these conjure for you? The picture is very hazy for many people, for even though 12% of Canada's landscape (an area roughly half the size of Europe), is comprised of bogs and muskegs, few have ever seen, let alone ventured into one.

Bogs come in several varieties: 'ribbed', 'domed', and 'quaking' to name a few. Together with their close relatives the 'fens', they make up a family of organic terrain called 'peatland'.

Traditionally, bogs have been blacklisted as "waste lands", useless for habitation or agriculture. The other side of the story is seldom told. Bogs are strange and exciting living components of Canada's north which directly affect wildlife, vegetation, water levels and even climate.

Prince Albert National Park is patterned with numerous bogs and the area you will enter shortly is an excellent example of the fascinating characteristics and mysteries that this environment holds.

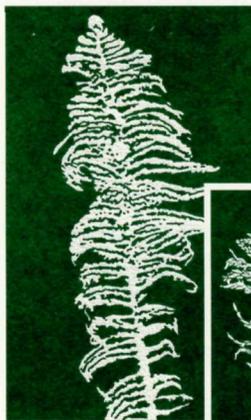
The bog awaits...

The Mossyard



Feather mosses...they surround you here. A shy group, they seek moist, dim habitats and grow low to the ground.

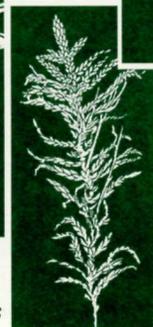
If you kneel at the boardwalk's edge and look closely, you'll find a variety of feather mosses woven together forming the rich, green carpet beneath the black spruce forest. The soils and tree cover determine the feather mosses' success in this area, but not all mosses are alike.



▲
KNIGHTS PLUME
Ptilium crista-castrensis



▲
STAIR STEP MOSS
Hylocomium splendens



▲
FEATHERMOSS
Pleurozium schreberi

Soon you'll be entering the domain of another moss whose growth is more aggressive. It is the "master of the bog", cousin to the feather mosses in front of you. You'll discover its identity once you reach the bog!

A Patchwork Of Forests



In this landscape, you'll rarely find stands of a single species of tree stretching over a large area. Instead, soils, slope, exposure and drainage interact to create a patchwork of different forests.

On its way to the bog, the trail passes through a variety of upland forests. In this spot trembling aspen and white spruce grow; around the corner black spruce takes over and further along, on a sandy ridge, jack pine dominates. The lakes, ponds and bogs dotting the landscape add another dimension to this patchwork.

Take a good look around.

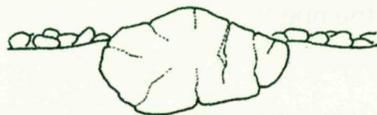
Get a feeling for this forest mosaic as you walk along.

Keep these images in mind and compare them with the forest of the bog.

KETTLE FORMATION



1. Ice block stranded from main glacier



2. Ice block partially buried in glacial till

No Water In The Kettle

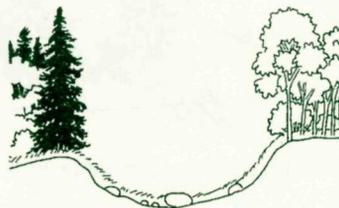


The depression in the ground before you is a kettle, a remnant of the glacial retreat 10,000 years past.

The glacier's icy hands sculpted the landscape, scraping and piling sand and gravel into this rolling terrain. And when it released its grip on the continent, huge blocks of ice were left stranded, separated from the main ice sheet. Slowly these ice blocks were buried, entombed by debris carried in the melting ice. With time, the ice blocks melted and slowly the soils above them sank, leaving a crater like this, called a 'kettle'.

This small kettle is dry. However, drainage is not always as good in other kettles, such as ones found in ancient, glacial meltwater channels. These broad channels were left behind after the great rivers from the melting icesheets subsided. Today, these channels are dry except for small lakes and ponds that occupy their lowest spots.

Boundary Bog lies in a kettle within an old meltwater channel. Kettles and meltwater channels are important because they are often places where bogs begin their life cycle, providing the drainage is poor. Such is the case you will discover on the trail ahead.



3. Ice block melts, till slumps. The kettle today.

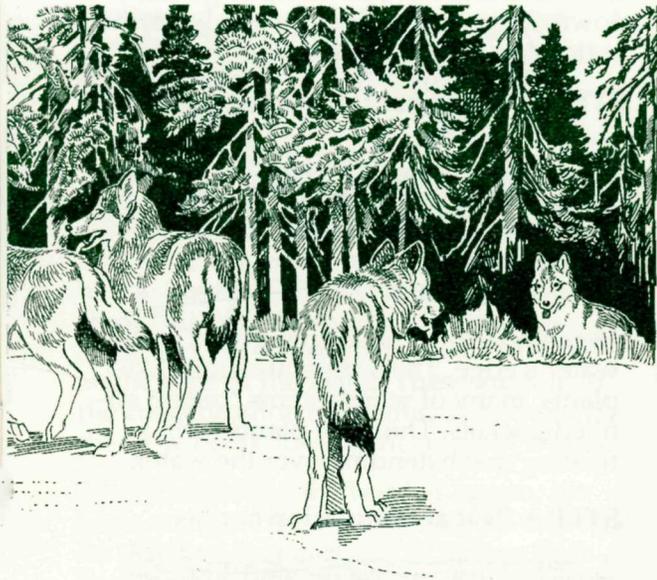
Rendezvous Ridge

By late June and early July, when the young wolf pups have grown into a platoon of clumsy two month old juveniles, the wolf pack leaves the den and relocates to a "rendezvous" site. This site, usually located on a well-drained ridge, such as the rim of the bog, becomes the temporary headquarters of the pack.



Here the pups scarp for food, develop their hunting skills, mock and menace their elders, sleep and grow until they are seasoned enough to travel with the adults. The lonesome howls of young wolves – perhaps from the site on which you are standing – led to the exploration of this area.

Just a few paces down the trail from this sandy, jack pine ridge, you enter the lowland that holds Boundary Bog.



Wolves on sandy ridge at the edge of the bog.

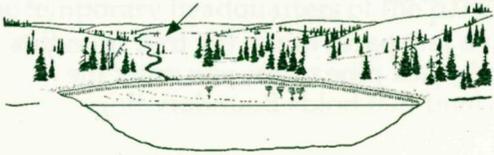
To Build A Bog



You have entered the realm of the bog.

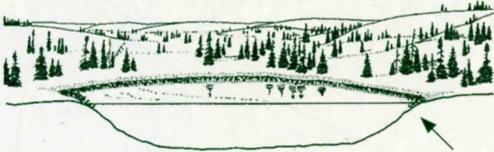
What does it take to create such an environment? Here's a simplified step by step look at the events in the life cycle of a bog.

STEP 1: Basin drainage becomes blocked



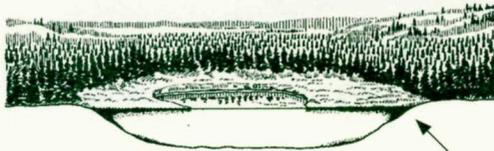
The first building block in nature's construction of a bog is the blockage of water flow from a basin. Sediments are carried in and have nowhere to go but down. They form a fine, suspended or 'false bottom' in the depression.

STEP 2: Sedge mat forms at water's edge



Vegetation, such as sedges, grows at the water's edge. The sedges are grass-like plants, many of whose stems contain air-filled pockets. Thus, the plants form a floating mat extending over the water.

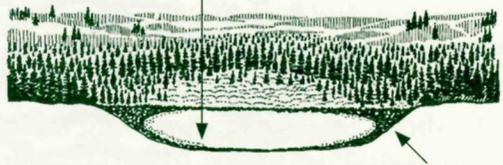
STEP 3: Peat accumulation begins



When a year's growth of bog sedges, flowers and shrubs die, they don't fully decompose because of their water-logged state and the cool northern climate. This layer of dead plant material accumulates creating an organic soil called 'peat'.

Check the surface beside you by kneeling and pressing firmly with your hand. Wet? Spongy? Most likely, for the "ground" you are standing on is, in fact, like a huge, sopping-wet mattress tossed into a swimming pool. This lowland is the pool and the mattress is a thick body of peat on which the bog vegetation grows.

STEP 4: Peat mat spreads Sedimentation and thickens Sedimentation continues



The peat body thickens, rises above the water table and begins to act as its own reservoir. The water held here is influenced by the organic soil. You might notice a shiny 'oil slick' in some spots, the tea-color and, for the adventurous, the slightly acidic taste of the water. These are due to the concentration of chemicals released by the slow breakdown of dead plant matter.

The formation of the bog has begun; it's been going on for a while. You are standing on a mat of peat perhaps 10 metres thick and 3,000 years old!

Jack Pine Island



Underfoot here the ground is dry and sandy.

"But it's supposed to be wet in a bog, isn't it?", you may be asking yourself.

A bog is a wet place alright, except Boundary Bog's basin contains several islands. This one is well-drained and supports a stand of jackpine trees. As you continue down the trail you'll once again enter a "sea of muskeg".



Master Of The Bog

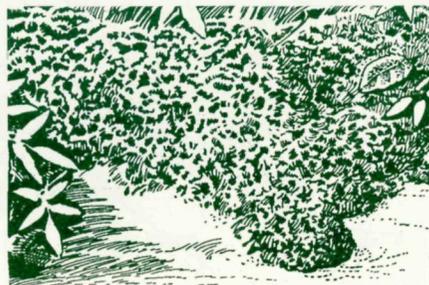


Kneel down. Beneath the sedges and shrubs you'll find the "master of the bog", SPHAGNUM MOSS. On the surface it looks innocent, but within that wet, green or reddish exterior is a plant capable of producing conditions necessary for its own survival.

At a point in the life-cycle of the bog the sphagnum moss grabs hold and begins its takeover. Specialized cells give it the incredible ability to absorb and hold many times its weight in water. New moss grows upon old, all the while drawing up water and literally drowning everything beneath it. Sphagnum moss grows faster than other mosses, creating an acidic environment for itself and robbing what little nutrients there are in the surrounding water from other plants.

Dead moss and the remains of other bog plants covered with sphagnum are forever trapped in a cold, acidic, water-logged, oxygen-poor environment and do not decompose, or do so very slowly.

The growth of the peat layer progresses under the rule of the sphagnum moss.



Sphagnum moss – growth habit.

Spruce Island



This second knoll in the bog is crowned by some of the tallest black spruce in the park. Years ago, when a fire raged on the uplands around the bog, this spot was protected by the water-logged, organic soil.

Although secure from a fiery death, the means to their downfall lies at their feet. The roots have spread out in a pancake-like fashion and such shallow rooting cannot forever support trunk and branches against the thrust of wind.

Now, windy days, growth and gravity catch up with a tree or two, and another muskeg spruce falls to earth.

The sphagnum moss you saw earlier along the trail shows off its mastery here again. Over the years it has crept up from the low spots and formed carpets and hummocks on Spruce Island.

BOUNDARY BOG

Eye of the Bog

Boundary Bog
Lowlands

Rendezvous Ridge

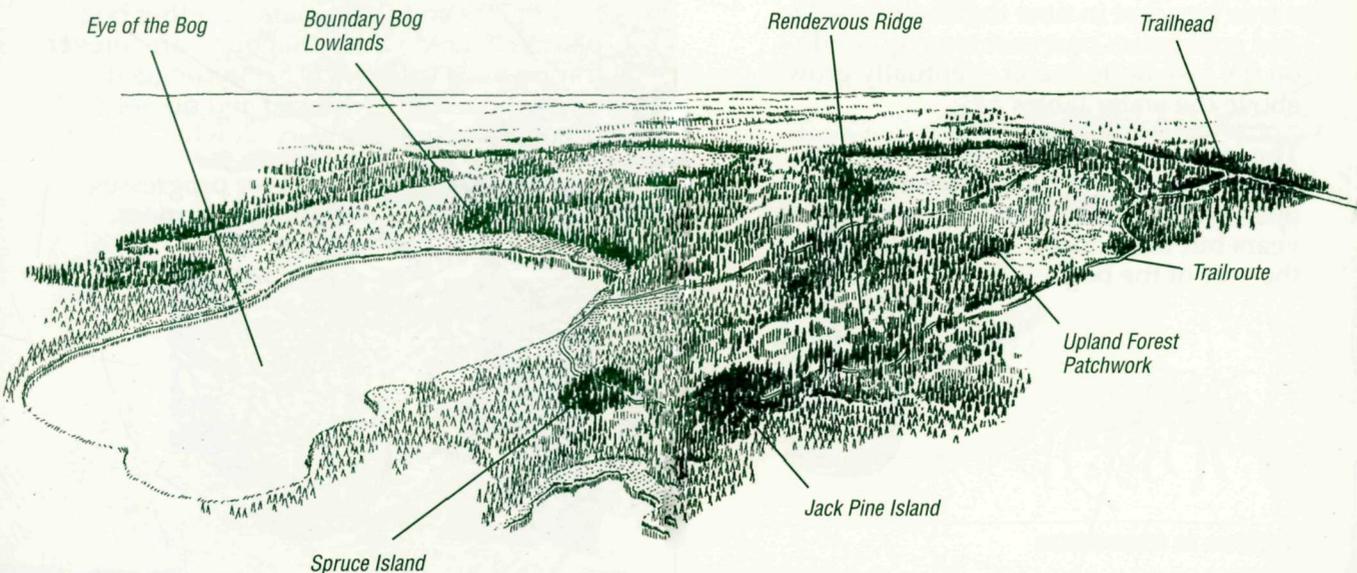
Trailhead

Trailroute

Upland Forest
Patchwork

Jack Pine Island

Spruce Island



The 'Eye Of The Bog'



You have reached the 'eye of the bog', a small lake in the centre of the bog's basin. This is where the water-logged fingers of the sedge and sphagnum peat, laced with the roots of bog shrubs like leatherleaf and bog birch, reach out across the open water. See if you can find them at the very edge of the 'shore'.

The water doesn't look very deep here but that's a 'false bottom' down there. It couldn't support your weight and it doesn't support the peat mat. Here the peat mat may be a couple of metres thick and it's still floating. A mat like this slowly bobs up and down when a heavy body moves across it, hence the origin of the term 'quaking bog'.

Areas like this one, which lead the bog's advance, are known as 'fens'. A fen is not a true bog, but in time the floating sedge and sphagnum peat mat may 'ground' on the lake bottom and eventually grow above the water table.

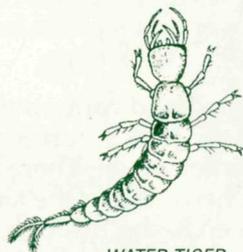
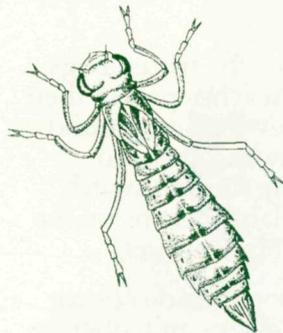
The invasion of the peat mat continues until it closes over the entire surface of open water. It may take thousands of years but that's just a 'wink' in time for the 'eye of the bog'.

Life In A Bog Lake

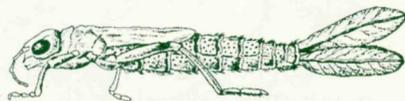


This small lake is host to many tiny creatures. Use these drawings as a guide and your hands as a net. No licence is needed to explore here; the only charge is your time and your promise to return your catch safely to its home.

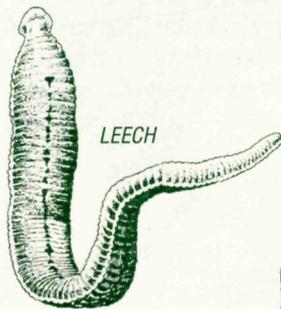
DRAGONFLY NYMPH



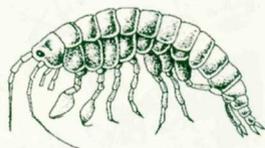
WATER TIGER



DAMSELFLY NYMPH



LEECH



SIDESWIMMER OR AMPHIPOD

Bog Wildlife



Few species of wildlife make their home in a bog. Most herbivores (plant-eaters) don't eat moss and it takes a lot of energy to slug through the water-logged peat. If there are few herbivores to prey upon, then it makes sense that very few predators will spend much time in the bog.

Voles and southern bog lemmings find cover and feed on herbs and sedges in the bog.

Woodland caribou make the frozen bogs of the park's northern reaches part of their winter range. There they feed on ground lichens. When the snow becomes too deep to dig through, the caribou switch to the more easily available lichens on the stunted tamarack and black spruce.

Birds common to the bog include spruce grouse, gray jays, yellowlegs and, often in winter, great gray owls on vole-hunting trips.

Though bogs aren't great habitat for the majority of animals in the park, they are still essential for certain creatures and are the home of some fascinating forms of plant-life. Keep your eyes open!



SPRUCE GROUSE

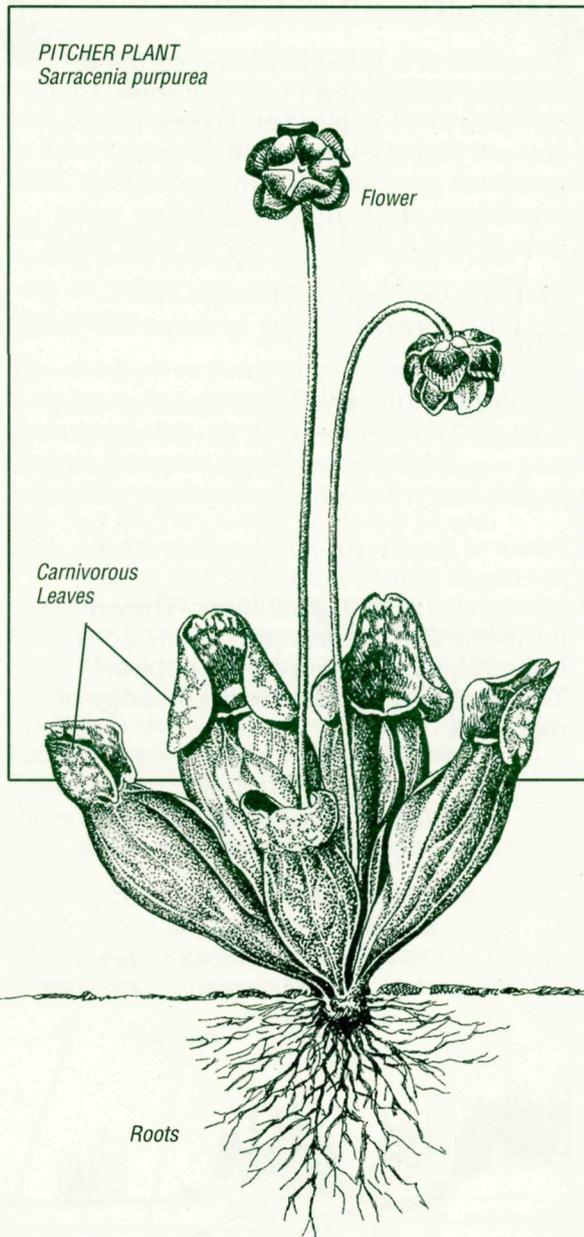
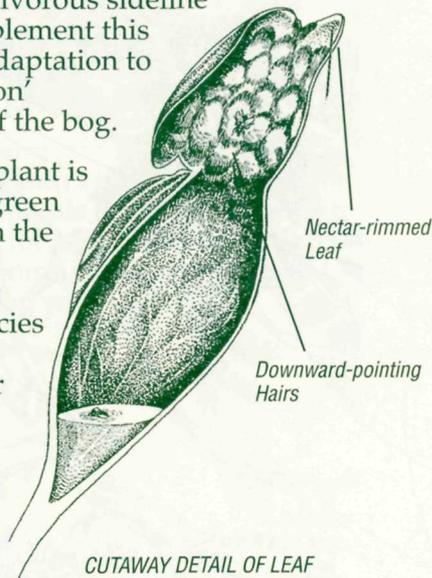
Pitcher Plant



The leaves of the PITCHER PLANT are deadly vessels designed to trap and consume insects. First, the pitcher's red glaze catches the insect's eye. Then the insect discovers the luring nectar-rimmed lip of the leaf from which it follows trails of nectar deeper into the trap. Each step takes it past a guard of stiff, downward pointing hairs. The hairs block its escape and within centimetres the insect loses its grip, betrayed by a slick wall. Its final resting place is the tiny pool of water in the bottom of the leaf. There the plant slowly digests, then absorbs its victim.

But why such an elaborate scheme? It is a response to the bog's lack of readily available nutrients. The pitcher plant has a root system which gathers raw materials but its insectivorous sideline helps it supplement this supply, an adaptation to the 'starvation' conditions of the bog.

The pitcher plant is one of four green carnivores in the bog. The bladderwort and two species of sundew also lay their traps here.



Tamaracks And Lichen



There are few plants that can compete with the sphagnum moss and those that do must live by its rules. The tamaracks around you eke out a living where nutrients are minimal. Under the harsh conditions of life in the bog many years pass before a tamarack grows very large.

A tamarack tree the thickness of a person's forearm can be perhaps 150 years old!

Growing on the tamarack branches are lichens. They are unique, for lichens are two organisms living as one – an alga (the foodmaker) and a fungus (the supporter).

Some of the five or six species you see are much older than you! Here on the tamarack, lichens grow older. They don't harm the tree but live only on its dead branches which are used for support. The tamarack wears them as a badge of maturity.

Peat And Permafrost



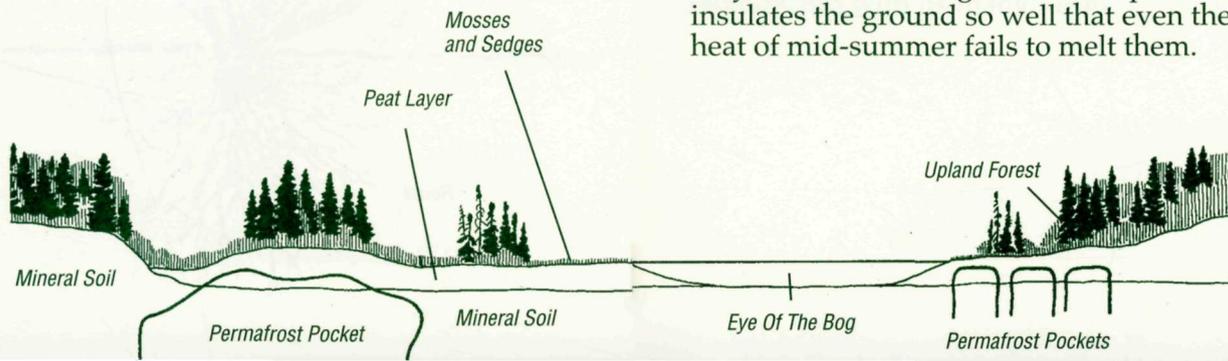
As you have learned, 'peat' is the built-up remains of plants which, because of cool, waterlogged conditions, have failed to decompose as they might have in a field or forest.

When removed from a bog and dried, peat is sold commercially as 'peat moss' – an excellent soil conditioner for gardens and lawns.

The absorptive properties of peat have long been recognized. Aboriginal people once used it as an effective disposable diaper. But peat is also an efficient insulating material. Pioneers recognized this fact and sometimes used it to seal their cabins from icy winter drafts.

The insulating quality of peat is the basis for a frosty story about peatlands. Permafrost is ground that remains frozen year-round. In Canada's high north, it underlies the tundra everywhere, but further south the icy hold weakens. Prince Albert National Park straddles the southern edge of the area where permafrost is found in isolated pockets.

Here in the park, those frost-pockets exist only within some bogs where the peat insulates the ground so well that even the heat of mid-summer fails to melt them.



Looking Back



The boardwalk and tower stairs you have just climbed have brought you back to the uplands cradling Boundary Bog. This is your last stop.

From here you can look back and see:

- the 'eye of the bog'
- the stunted tamarack and black spruce that struggle for life on the sphagnum and sedge-dominated peat mat
- the patchwork of forest that runs down to the edge of the bog's basin following the roll of the land

You are one of the relatively few who have witnessed the strange sights and scents of the bog. Its protection in a national park ensures that others will have the same opportunity to experience this fascinating and ecologically important landscape for all time to come.

Return to Boundary Bog when the pitcher plants are flowering, when autumn's hues adorn the tamarack, when winter snows blanket the mosses, return anytime...

From the lookout tower it is about another five minute walk to complete the trail.

Another Word About Bogs



Bogs are worth protecting! And not just the bogs and other forms of peatlands in national parks.

Peatlands the world over are important natural regulators of water levels. They hold a tremendous volume of water and release the supply gradually to continental watersheds.

As storage sites (or 'sinks') for undecomposed plant tissue, they are critical factors in the global regulation of carbon dioxide levels in the atmosphere. Thus, bogs and their kin may prove to be man's allies in controlling the 'green house effect' and its impact on the earth's heat balance.

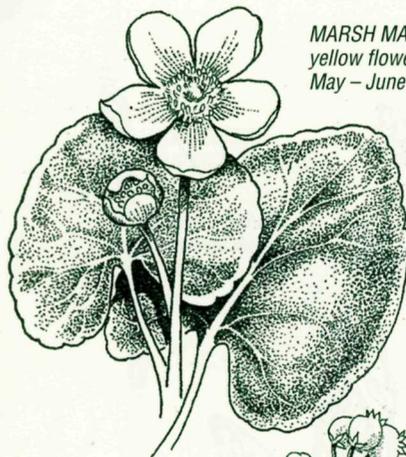
The potential for serious disruption of natural processes and environments because of alterations to peatlands makes their protection and wise use essential. National parks protect, for all time, examples of Canada's rich heritage of nature. Prince Albert National Park and Boundary Bog play important roles in this protection and are special places where we can come to better understand and appreciate the wild and our fragile relationship with its many forms.

Some Common Plants

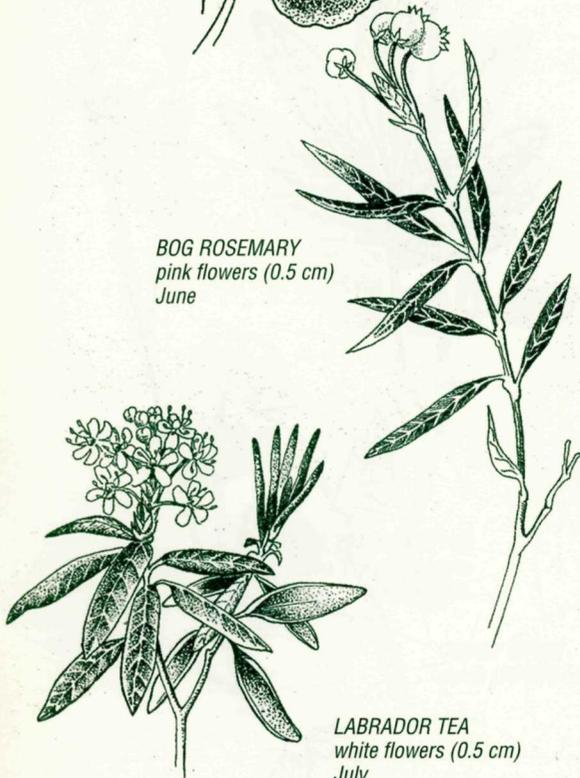


BUCK BEAN
white flowers (1.5 cm)
June

ONE OF MANY SEDGES
plant (10-50 cm)



MARSH MARIGOLD
yellow flowers (3 cm)
May - June



BOG ROSEMARY
pink flowers (0.5 cm)
June

LABRADOR TEA
white flowers (0.5 cm)
July

Some Common Plants

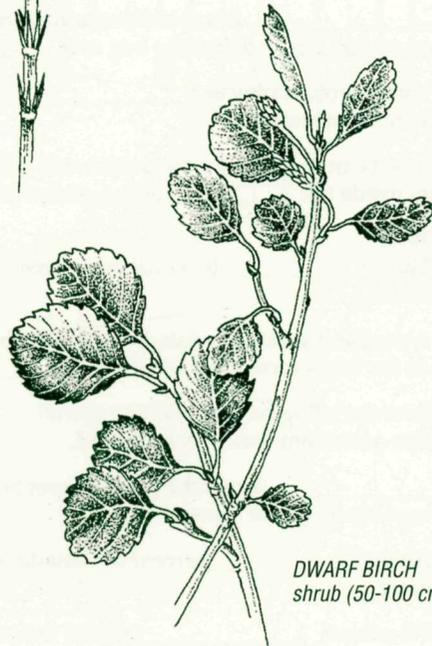


MARSH CINQUEFOIL
purple flowers (2 cm)
July - August



HORSETAIL
plant (10-30 cm)

COTTON GRASS SEDGE
white flowers (2 cm)
July - August



DWARF BIRCH
shrub (50-100 cm)

Trail Quiz



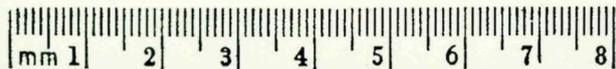
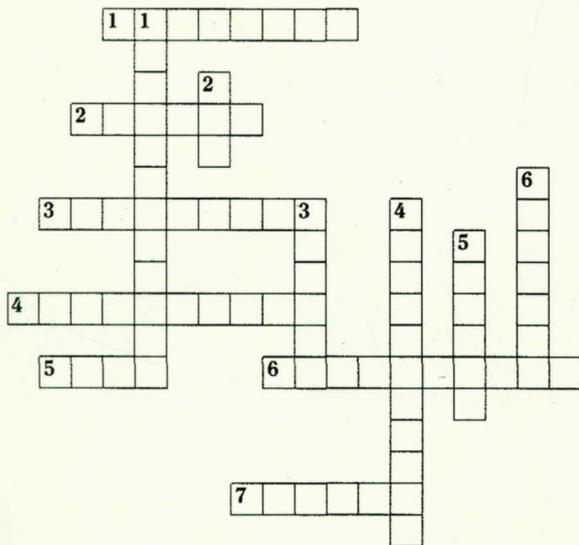
Try the Boundary Bog quiz and puzzle. All the answers can be found in this guide. If you have more questions about the bog's story, one of the park interpreters will be happy to help answer them.

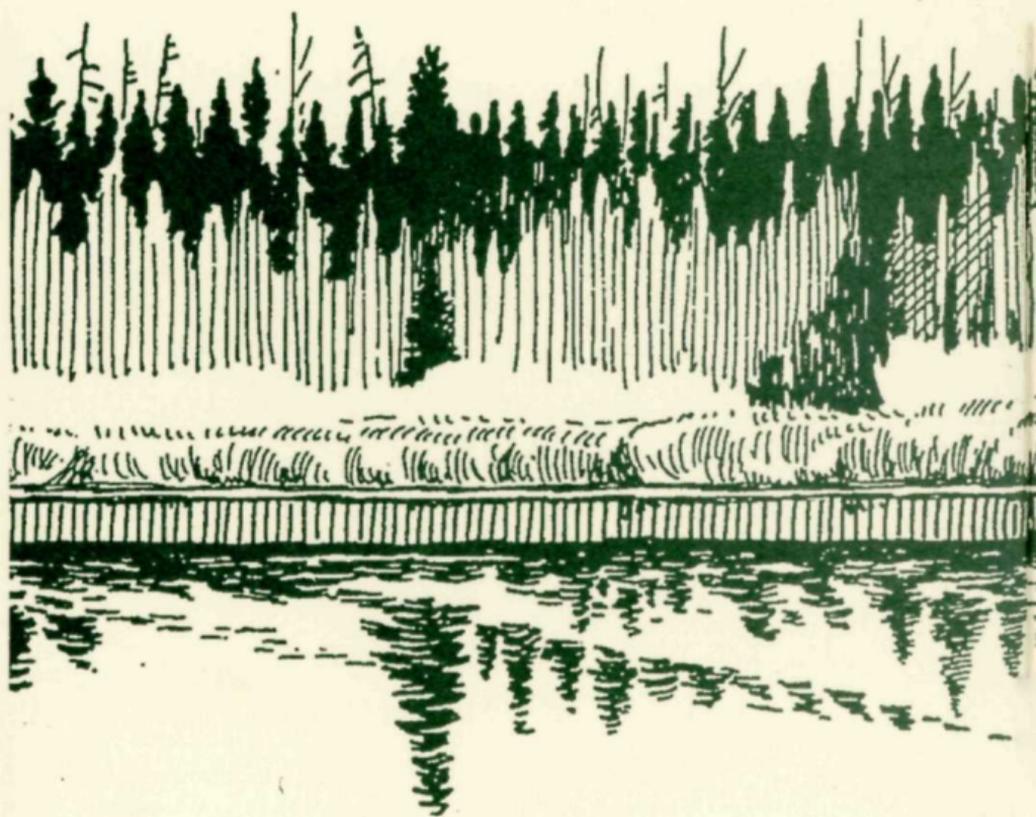
ACROSS

- _____ is the master moss of the bog.
- Fungi and algae live together to create a new organism called a _____.
- A _____ protects fragile bog mosses along the trail and helps keep your feet dry.
- Some Prince Albert National Park bogs are underlain by pockets of perennially frozen ground called _____.
- _____ is a thick accumulation of dead plant matter which forms the bog mat.
- Young wolves play at a _____ site after leaving the nursery den.
- Insects are trapped by the downward-pointing hairs inside the _____ of the pitcher plant.

DOWN

- The _____ is one of three green carnivores in the bog.
- A peatland which is related to and which often leads the bog's formation is known as a _____.
- Boundary Bog has formed in a glacial _____ within a remnant meltwater channel.
- _____ forms the green carpet beneath the upland black spruce forest.
- About _____ percent of Canada is bog and muskeg.
- Woodland _____ inhabit the park's northerly bogs.





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