Without sphagnum mosses there would be no bogs in Scotland. You might not think that this is important as people often think of bogs as wet, muddy, dangerous places, but they are in fact fascinating places which are home to some of the most beautiful and unusual plants and animals found in Scotland. Bogs have a living surface which is created by a mass of sphagnum mosses floating on dead, water soaked material which may be several metres deep. This is why it feels bouncy if you walk across the surface of a bog.

Sphagnum moss acts rather like a sponge and can stay wet long after any surrounding soil has dried out. It can soak up more that eight times its own weight in water. If you look at sphagnum moss leaves under a microscope the box-like structures that you see are cells. These are easy to see in moss leaves because they are arranged in a single layer. In sphagnum leaves narrow green cells are squeezed in between wider colourless cells. The wider cells have pores through which water can move in and out, giving the sphagnum its sponge-like property.

A single sphagnum moss plant is very small. It grows packed closely together with many other plants of the same kind and they provide support for each other’s tiny stems. This produces a soft spongy carpet which often looks like a colourful patchwork, as each kind of sphagnum moss has its own shade of colour, ranging from red, pink and orange through to green. Different kinds of sphagnum moss are adapted to different conditions. Some grow underwater in pools and wet hollows. Others can survive in fairly dry conditions. Hummocks are created by sphagnum mosses growing to form large mounds up to a metre high.

**Life cycle**

Mosses do not produce flowers or seeds. They grow from spores which are produced in fruiting bodies called capsules. In sphagnum when the spores
are ripe pressure builds up inside the capsule until its lid is blown off, sending the spores shooting out into the air. Sometimes this does not happen and the lid just drops off or the capsule disintegrates.

Different kinds of sphagnum mosses grow at different rates. Some grow only a few millimetres a year, while others grow over 3cm. When they die they do not rot away because the ground is both wet and acidic. Waterlogged soil contains little oxygen which means that the bacteria and fungi that normally break down dead plant material cannot survive. The sphagnum mosses themselves produce chemicals which increase the acidity of the water and further prevent the decay of dead plants. This means that the dead remains of the sphagnum mosses pile up and get pressed together to eventually form the soil we know as peat. This is a very slow process. It can take from 7,000 to 10,000 years to produce a layer of peat 7–10 metres thick.

**Life among the sphagnum mosses**

Bogs provide vital wetland habitats for rare plants and birds. Sphagnum itself is eaten by hardly any organisms. However huge numbers of microscopic plants and animals live in the water surrounding the moss plants, in the film of water that clings to them and inside the open cells of the leaves. These organisms provide food for insects and spiders which are eaten in turn by frogs, reptiles, birds and mammals. The most obvious insects flying over bogs are huge dragonflies. Some dragonflies lay their eggs directly onto sphagnum mosses.

Larger animals are also found on bogs. Many different kinds of bird feed and nest on bogs, including rare birds like the red throated diver. Red deer wallow in peat baths to get rid of flies and other parasites. Otters and badgers sometimes search bogs for the eggs and the chicks of ground nesting birds.

A number of plants have adapted to cope with the harsh conditions in bogs and are found growing among the sphagnum mosses. These include colourful plants like heathers, bog asphodel, cranberry, bogbean and cloudberry. Carnivorous plants, like the sundew, have specially adapted leaves
which catch and digest small insects.

**Where do sphagnum mosses grow?**

Sphagnum mosses are found growing in damp or wet places. These include beside streams, in wet woodland, on moorland and, in particular, on bogs. In the lowlands of Scotland they grow on large domes of peat known as raised bogs. Many raised bogs have formed on the sites of small lochs left around 10,000 years ago at the end of the last ice age. Over thousands of years peat has slowly built up between the waterproof base of the bog and the living surface to form a dome shape which is higher than the surrounding land. There are very few raised bogs left in Scotland and those that do remain are often surrounded by farmland.

Areas with high rainfall like the northwest of Scotland provide ideal conditions for blanket bogs to form. Blanket bogs are younger and shallower than raised bogs but can cover large areas. They are also formed in a different way. The high rainfall in these areas has washed much of the goodness out of the soil leaving it wet and infertile. Sphagnum mosses grow well in these conditions but few other plants can survive. The layers of dead sphagnum have built up over a period of 3,000 to 7,000 years forming a skin of peat across much of the landscape.

**Humans and sphagnum moss**

When sphagnum moss is dry it is not only absorbent but also mildly antiseptic. During the First and Second World Wars it was collected in many parts of the Highlands and sent south to be turned into wound dressings. It was also used for lamp wicks, bedding and babies nappies. Sphagnum moss is now used by gardeners for a variety of purposes. When sphagnum is added to seed raising and potting mix its natural antibiotic activity reduces the risk of fungal infections. It keeps seeds and plants moist but allows oxygen to reach them. The linings for hanging baskets are made out of sphagnum moss and it is used to make wreaths and other plant decorations. It also has more specialised uses including in orchid growing and as a packing material for transporting live, aquatic animals.

**Humans and peat bogs**

Peat formed from sphagnum moss has been used by man since at least Roman times as fuel for heating and cooking and to provide roofing for houses. Crofters in the north and west of Scotland still gather peat for their own use. They cut blocks of peat and then leave it stacked up in a pile to dry.

In lowland areas of Scotland many bogs have been drained and planted to make way for farming or forestry. Since the 1960s peat has been used to make garden compost. This has led to huge areas of bog being destroyed by large machines which remove layers of peat from the bog surface. In Central Scotland the small remaining area of a once massive raised bog called Flanders...
Moss is a National Nature Reserve. Scotland is one of the few places in the world where blanket bogs are found. Some areas of blanket bog, like the RSPB’s Forsinard reserve, now have special protection. In the 1980s large areas of blanket bog in Caithness and Sutherland were lost because they were turned into forest plantations, but such extreme planting no longer takes place. Blanket bogs have also been badly damaged by agricultural drainage, pollution, burning and over grazing by deer and sheep.

Thanks to campaigns by environmental organisations people are now much more aware of the need to protect sphagnum moss and peat bogs. It takes thousands of years to make a bog and once they are destroyed there is no way of getting them back …..unless we wait for another few thousand years.

**Finding out more**

**Bogs**, Scottish Natural Heritage.

**How you can help**

Persuade people in your family to use alternatives to peat. Make your own compost from garden and kitchen waste. 'International Bog Day' takes place each year. Look out for special activities and events to celebrate this day in your area.

You could become involved with groups of other people concerned with the future of Scotland’s wildlife. Check your local newspaper or library for information about groups in your area.

Scottish Wildlife WATCH, which is part of the Scottish Wildlife Trust (SWT), produces a magazine and Scottish newsletter which include information about environmental issues and give you the chance to help wildlife by taking part in projects and surveys. Contact: Scottish Wildlife WATCH, Cramond House, Cramond Glebe Road, Edinburgh EH4 6NS

**Glossary**

**Carnivorous**
An animal or plant that eats other animals.

**Habitat**
The place in which an animal or plant lives.

**Plantation**
An area of planted woodland (often used to describe large areas recently planted, mainly with conifers).

**Pore**
A tiny hole through which water or air can pass.