Peatland restoration

INTRODUCTION

Our mountain bogs are areas of peatland. Simply put, peatlands are areas where peat is found. Peat is the accumulation of undecomposed plant material that has built up over years and centuries.

Peat is formed on land that remains almost permanently wet from the remains of dead plants that are unable to decompose due to a lack of oxygen. Over time layers of this plant material build up with deeper layers being older than those above. As the layers of peat develop they compact the layers below preventing any further decomposition and so the peat keeps growing. On average peat grows about 1mm every year, and in Scotland we have peatlands that are over 10 metres deep.

The main builders of peat in Scotland are a group of mosses called Sphagnum which thrive in wet conditions and can hold over 10 times their weight in water.

The wet, wild mountains of the Loch Lomond and The Trossachs National Park are therefore the perfect place for this important habitat to form. One type of peatland that grows on many of our mountains has formed a layer so thick it smooths out the features of the land like a blanket on a bed - this is called a blanket bog.

In healthy peatlands, the living vegetation that is currently visible on the surface will form future layers of peat. Plants absorb carbon from the air to grow, and because this carbon is not released as the plants die (as they do not decay), growing peat actually removes carbon from the atmosphere and locks it up. Because of this the peatlands of the National Park store more than 20 million tonnes of carbon. They are the best carbon store we have, so it's vitally important we work with land managers to help protect and restore them.

Sphagnum moss growing in wetland

Photo © RJCooper LL&TNPA

Peatland, Beinn Bhreac

Photo © A. Major LLTNPA

Wild Park

Wild Park is concentrating on the following four threats:

POOR QUALITY OF SOME LOCHS & RIVERS

Negative impacts on freshwater and marine water bodies from problems such as pollution from surrounding land uses.

INVASIVE, NON-NATIVE SPECIES

The spread of invasive non-native species, which displace our rich native wildlife.

UNSUSTAINABLE LEVELS OF GRAZING

Unsustainable levels of wild and domesticated grazing and browsing animals in some upland and woodland areas, leading to reduced tree cover and the erosion of soils, which are important carbon stores.

CLIMATE CHANGE PRESSURES

The impacts of climate change leading to warmer, wetter weather patterns and a subsequent increase in flood events, major landslides and rapid shifts in natural ecosystems.

Historically, our mountains have been managed in a way that has caused damage to the blanket bogs. As a result the condition of these peatlands has deteriorated and is a poor habitat for wildlife. The peatlands have been drained in an attempt to make the land better for planting trees, or to allow animals to graze (including sheep and cattle). The drying of the peatlands combined with overgrazing, inappropriate burning, or erosion through recreational use has caused the widespread degradation of the habitat.

Damaged peatlands not only stop absorbing carbon but also start to emit carbon in the form of Greenhouse Gases into the atmosphere as the peat decomposes. These gases contribute towards climate change. The peatlands also release organic matter including carbon into water, which turns it brown.

These particles can silt up fish spawning beds and reservoirs and reduce oxygen in the water, affecting the invertebrates and fish that live in the burns, rivers and lochs. Drier peatlands are more susceptible to wildfires.

However, getting the right grazing levels suitable for these areas and undertaking sensitive restoration, such as grip (drain) blocking, the condition of the peatlands can be improved and these impacts eventually reversed. By working together across large areas of the National Park management of our peatlands can be integrated with other land management activities to ensure the whole landscape is used in a sustainable way. This will involve working with private landowners to draw up and implement deer (and other grazing animals) management plans, forest plans, and peat conservation projects.


Peat hag before re-profiling


Peat hag after re-profiling

Photo © RJ Cooper LLTNPA

Objectives for 2023

- **Peatland restoration:**

  Reduce carbon and water flows through restoration of peat bogs and raise awareness of the value of peatlands in the climate emergency.

  Increase the public's understanding and appreciation of the value of peatland habitats by working in partnership to host public events and talks, visitor centre displays and increasing volunteering opportunities to get involved in improving peatland habitats e.g. constructing peat dams, removal of INNS, surveys and the Mountains and the People project.

- **Resilience:**

  Pilot the use and management of trees, woodlands, peatlands and waterways upstream to reduce the risk of downstream flooding.

  Promote the management of designated sites which move these protected areas towards favourable condition.

Peatland Restoration

The Loch Lomond & The Trossachs National Park Authority is working towards reducing the impacts of climate change. One of our key initiatives to do this is through our Peatland Restoration programme. By working with landowners and managers we hope to put on the path to recovery the areas of degraded peat that occur throughout the park.

LUSS CASE STUDY

In Sept 2017 work was completed on the second phase of a major project to restore peat bogs on Luss Estates within the National Park.

The joint project between the National Park Authority and Luss Estates saw work on 80 hectares on Beinn Dubh and Mid Hill, above Glen Luss (see map below).

The £65,800 project, funded by Scottish Natural Heritage's Peatland ACTION fund, involved reprofiling peat hags, and also blocking gullies, building peat dams and establishing vegetation over areas of bare peat in order to prevent peat from drying out and releasing carbon into the atmosphere.

Hag reprofiling

The project included an innovative trial of Sphagnum plug planting on two areas of bare peat. This is a new method for getting Sphagnum moss to recolonise areas of bare peat by taking clumps of the moss from healthy areas and planting it at a rate of around four clumps per square metre in hollows stamped into the bare peat. The bare peat needs to have a high water table and this has been restored by putting in dams to hold back water on the site.

Luss Estates and the National Park Authority successfully collaborated on the first phase of work in 2015. In places it is hard now to see where the bare peat previously existed as these areas have successfully grown over; a healthy revegetated blanket now covers the hillside in these restored areas.

Mitigating against Climate Change

Alongside the long-term climate change and biodiversity benefits, there are indirect economic benefits to conserving our peatlands. Healthy peat bogs provide a vital function within the hydrological cycle, helping to store and release water slowly which reduces the impacts of both floods and droughts. Peat bogs in poor condition on the other hand can erode during flood events, leading to a loss of water quality, and they do not have the same ability to slow the passage of water downstream. Conserving our mountain bogs helps to mitigate the impacts of flood events downstream and also help to maintain our water quality during these extreme weather events, which are becoming more common due to climate change.

As well as mitigating against climate change, restoring peatlands will also help reduce two of the other key threats highlighted in Wild Park.

- **Poor quality of some lochs & rivers**
  Negative impacts on freshwater and marine water bodies from problems such as pollution from surrounding land uses.

  By covering degraded peat and putting peatlands back on the road to recovery prevents particulate matter entering our waterways helping keep the waters clear and unchoked.
- **Invasive, Non-Native Species**
  The spread of invasive non-native species, which displace our rich native wildlife.

  Putting the peatlands back on to the road to recovery produces a habitat that is hostile to some of the invasive species that could dominate on degraded peatlands (e.g. Rhododendron).

Photo © Tracks Ecology

Future projects

So far the National Park Authority has worked on eight peatland projects restoring approximately 400 hectares of mountain bog across the National Park. Five further projects are in development for 2020. It is hoped that with the availability of grant funding this work can continue to stop further degradation of our peatlands; and restart the growth of these important habitats.

Questions and pupil enquiry

- What past land use practices have contributed to the decline of healthy peatlands?
- Explain how peat can both store and release carbon.
- List the number of ways to improve the health of peatland.
- What are the economic benefits of a restored peatland?
- What are the biodiversity benefits of restoring a mountain bog?
- Why does there need to be a high water table for sphagnum moss re-colonisation to be effective?
- How old are the oldest Scottish peatlands? - Why are there none any older?

FURTHER READING

Online

- More than just a Bog Education resource for Geography and Biology subjects
- UK National Parks Moorlands as Indicators of Climate Change Initiative (MICCI)
- Peatland Action: Future proofing Scotland's Peat bogs (SNH Publication)
- Peatland Action – project resources
- Peatland Carbon fact and figures (SNH Publication)
- Peatland Learning Module (SRUC)

Videos

Wild Challenge 3 - Mountain Bogs

Blanket Bog in a bottle experiment

Site visits

- Balmaha on east Loch Lomond is a great location to base a field visit, with the National Park Visitor Centre and Outdoor Classroom available for school groups. Conic Hill is a short hill climb accessible through the rear of the car park at Balmaha.
- Other sites suitable for field visits include the hills around Luss, west Loch Lomond.