



Peat in the Peak: Restoring our Peatlands

Recognise that with the proper care and methods the peat and blanket bogs can be restored to a healthy habitat.

KS2: Teachers' information and worksheets

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Introduction

Learning objectives

- To recognise that peatlands can be restored to a healthy habitat
- To understand that restoration will improve biodiversity on the Peak District's peatland
- To describe 3 key benefits of healthy peatlands

Curriculum link

Science:

- Living things and their habitats

Geography:

- Comparing an area of the UK with that of another country
- Describe and understand key aspects of physical and human geography

Wider links:

Cultural capital – National Parks and the wider countryside of the UK is a valued cultural asset that millions can enjoy and get benefits from.

UN Sustainable Development Goals: 15 Life on land: Protect Biodiversity and Natural Habitats

Overview

This is the third lesson from our Peat in the Peak series which will provide the opportunity to explore the effects positive human actions can have on a habitat and understand that this can have a many positive knock-on effects on the wider ecosystem.

If you haven't already done so, we would recommend first completing lessons 1 and 2 in the series 'Peat in the Peak: Why is Peat Special?' and 'Peat in Trouble'. These lessons will explain what peat is, why it's important and how peat and our blanket bogs have been damaged by human activity. It is important to complete these lessons first in order to have a full picture of the problems our peatlands are facing and the solutions to restore them back to a healthy ecosystem.

Many of our natural habitats are facing threats causing their destruction or degradation and peatlands are no exception. Unfortunately, most of these threats are directly or indirectly due to humans. However, many organisations like the Peak District National Park and Moors for the Future have been undertaking many restoration projects across the Peak District moorland using a variety of methods to improve species diversity, water retention, CO2 capture and flood prevention.

Activity sheets are provided at the end of this document to help enhance the students learning.

In the notes you will find questions in **bold** with an answer in *italics*. These are suggested questions/discussion points based on the slide to help develop the students understanding of the topic.

Not all presentation slides are included in the guide if there is no additional explanation needed.

Presentation Slides

Slide 4

Recap of 'Peat in Trouble' lesson:

Go over the quiz questions the students created at the end of lesson 2.

How much do they remember about the threats to peat?

Quiz Time!

- Time to find out how much you remember about the threats to the Peak District peat!
- Your teacher will read out some of the quiz questions you created at the end of the last lesson, do you remember yours?



Slides 7-14

Slides **7** and **8** show how mini dams have been created in the gullies on the peat to stop the flow of water off the moor and how this helps the vegetation recover and protects the peat from greater damage and erosion. This is called GULLY BLOCKING.

These slides show dams made of stone however there are many types of material used to make the dams; heather bales, wood, plastic and peat.

Click on this link [Dams](#) (hyperlink on slide) and show the class the video on how and why dams are used on the moor....This will help the students answer the questions on [Activity Sheet 1](#)

1. Building dams

What difference have the dams made in these photos?



1. Building dams

- Stops water washing the peat away
- Provides the wet conditions needed for more peat to form
- Results in more moorland plants starting to grow
- The plants protect the peat



Slides **9** and **10** explain how **heather** is used to stabilise the peat by preventing more erosion and protection of the soil.

Heather is harvested from areas of the moor where there is good coverage and transported to the sites where it is needed.

Click this link [Heather Brash](#) (hyperlink on slide) and show the class the video of how heather is transported and used to restore the moorland vegetation, then answer the questions on [Activity Sheet 1](#).

The relevant video for this work is called 'Stabilising bare peat with heather cuttings.' (you only really need the first minute and a half, the rest is more detail than required).

2. Heather brash

Heather brash = heather branches containing seeds are spread over the degraded peat

- It protects the peat and heather seeds from being washed away by water
- It allows new plants to grow and their roots help keep the peat in place
- It is transported to the moor in large bags by helicopter



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Slides 7-14

Slides **11** and **12** explain how **Sphagnum Moss** is used to retain water in the blanket bogs that create the peat.

The Sphagnum Moss used for replanting is specially grown at a plant nursery and brought to the site for planting.

Click on this link to find out more about [Sphagnum Moss](#).

3. SuperMoss!

Once the vegetation is developing sphagnum moss is planted

Guess: Sphagnum can hold ?? times its' own weight in water?

Up to 20 times!
Could you absorb 20 watery versions of yourself?



Slides **13** and **14** explain how footpaths in the Peak District have been eroded through use by millions of visitors causing damage to the vegetation and peat. Hardwearing stone slabs have been used to prevent more erosion and allow the vegetation to regrow.

These slabs have been brought from the old disused factories and mills that are now being demolished in the big cities around the Peak District. Often the stone for these slabs would have been originally quarried in the Peak District and taken for use in the factories and mills, so now it's coming back!

For more info follow [this link](#)

4. Resurfacing paths

How harder surfaces are added to paths to encourage visitors to use them.

This reduces erosion caused by the feet of the many visitors who walk in the Peak District each year.

Can you guess how many feet walk in the Peak District every year?



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How harder surfaces are added to paths to encourage visitors to use them.

This reduces erosion caused by the feet of the many visitors who walk in the Peak District each year.

Can you guess how many pairs of feet walk in the Peak District every year?



12.25 million visitors to the Peak District each year, the majority of those walk the footpaths, so many millions of feet!

Slides 15-16: The transformation story of Black Hill.

These two slides explain how the effects of the industrial revolution and the extreme pollution from surrounding cities destroyed the vegetation cover on peat in the northern part of the Peak District:

Click through the animations to explain the impact of industrial pollution on the peatland.

A picture of Manchester in the 1800's. Describe why the air was so dirty in cities like Manchester from 1800's till 1970's.

From the 1800's until the 1970's Manchester was very dirty with factories and homes burning fossil fuels for energy.

Describe how the prevailing winds blows the polluted air towards the peatland.

Describe how the pollution (NO₂ and SO₂) in the dirty air mixed with water vapour and fell as acid rain killing the vegetation.

You can make this section as technical as you feel is appropriate for your class.

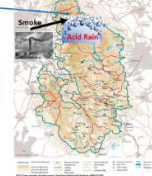
Case Study 1: Restoring the damaged peat on Black Hill, Peak District National Park

Black Hill is located here at the top of the Peak District National Park.

Peak District National Park

Can you name the big industrial city to the West of Black Hill?

Can you find where your school is on the map?



BLACK HILL: How it's changed since the 1800's



This is how Black Hill will have looked before the Industrial Revolution of the 1800's... a healthy blanket bog with a big variety of plants, animals and waterlogged ground. This was a perfect habitat to store CO₂.



By the 1970's acid rain from Manchester had killed the vegetation on the blanket bog and exposed large areas of peat. The peat was now slowly eroded by wind, rain and walkers. The damaged peat released CO₂ into the air.

Slides 17-23 (These relate to Activity 2)

Slide 17: How badly the peat had been eroded away from the top of Black Hill. Note how much the ground level has dropped over 14 years. The Pennine Way is a very popular long-distance walking route running 300 miles from the Scottish border to Edale in the Peak District.

Slide 19: What positive changes have taken place to the ground on top of Black Hill...the white plant you can see in the picture from 2016 is [Cotton Grass](#).

Slide 20: How has the restoration of the peat and blanket bog benefitted *wildlife/biodiversity*? *more plant variety = more of the insects that rely on them = more insect eating animals like bats.*

Slide 22: Here is the start of Activity 3 which is a longer classroom activity to create a timeline for peat in the Peak. This would be a good place to stop if you plan to do this activity in another lesson.

Activity 3 resources are below in the worksheets section.

Black Hill: Erosion of peat on the Pennine Way

1976 The same trig point on Black Hill 14 years apart. Can you work out how much of the peat around the trig point has been eroded away? What has happened to the peat since the trig point in 1976 or 1990 or 1976? (It's not just the peat on the hill!)

1990

Restoring Black Hill:

2001's wooden walkways were laid across the wet peat. 2002 - a new granite path is built over eroded peat. 2003 a new wall was built to protect the trig point.

These paths: Why do you think they don't sink? Can it be done with what happens to wood when it gets wet?

These granite slabs were brought to the moor from old old buildings in the big town around the Peak District. Is this eroding or saving?

Check it the ground behind the trig point: What colour is it? Are there any plants (vegetation) here?

Task: create a timeline of what has happened to the peat habitat since the 1800's.

Questions to help you:

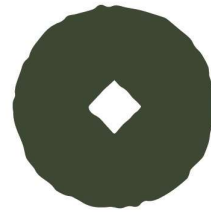
- What did the peat look like before the industrial Revolution in the 1800's?
- What caused the vegetation to disappear from the moorland between 1800 and the 1970's?
- How much peat had disappeared on Black Hill by the 1990's?
- What methods did they use to try to prevent more damage from the Pennine Way walkers and restore the peat?
- What methods have been used by Moors For the Future to help restore the blanket bog and protect the peat?
- What changes have taken place since 2007?
- How has biodiversity improved on Black Hill?

Your teacher will show you the previous slides again to help you!

1800's _____ 2022

We'd love you to share some of your completed timelines with the Ambassador Schools project.

- Twitter: @peakdistrict
- Facebook: [facebook.com/peakdistrictnationalpark](https://www.facebook.com/peakdistrictnationalpark)
- #PDNPSchools #PeakDistrictProud
- Email us: ambassadorschools@peakdistrict.gov.uk

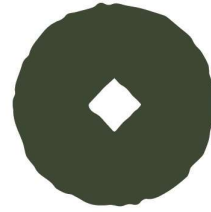


Worksheets

Activity 1 – What’s being done to help the peat?

Find the answers to the questions from the videos and slides

Question	Answer
<p>Why are dams built on the blanket bog/peat moorland?</p> <p>What are the different materials used to make dams?</p>	
<p>What is heather brash?</p> <p>How does spreading heather brash help the peat moorland recover?</p> <p>How is the heather brash transported? Can this be done at any time?</p>	
<p>Why is sphagnum moss a Super Moss?</p> <p>How does sphagnum moss help with flood prevention in villages, towns and cities below the moorland?</p> <p>How do you think it could help to stop moorland fires spreading?</p>	



Activity 2 – Reducing erosion on the Pennine Way (find answers on slides 17 – 20)

The Pennine Way is a 300mile long distance walking footpath stretching from the Scottish Borders to Edale in the Peak District National Park. Black Hill is a hill on the Pennine Way and had been badly eroded by many people walking across it.

How much peat had disappeared from Black Hill by 1990?

Why did the wooden walkways fail?

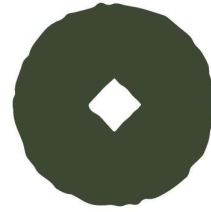
Where did the stone slabs that make up the new footpaths come from?

Is this recycling or reusing?

Use the pictures to describe at least 3 changes that have happened to the peat moorland since the stone paths were built?

If you have more flowers on the moor what types of animals will there be more of?

List some good impacts from those changes you have spotted.



Activity 3: Create a timeline of the erosion and restoration of the peat (teacher's guide only)

This activity can be independently, in groups or pairs.

Resources per group/student:

- A3 paper
- 1 Picture sheet (below)
- 1 Key phrases sheet (below) – you may choose not to use these and ask students to write their own annotations
- Scissors
- Glue/sticky tape

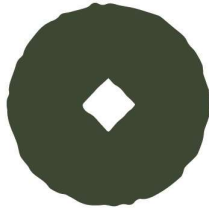
Method:

Make sure the group can see slide 22 to help. And you may need to show slides 15-21 again to help!

The students will need to:

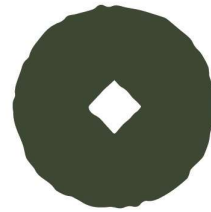
- Draw a line across the middle of A3 sheet with an arrowhead pointing left to right (like the line on slide 22).
- Cut out the pictures and key phrases/dates
- Stick the pictures in 'time' order from left to right
- either a) write their own phrases and dates or b) use the sheet provided to cut and stick next to the correct picture.

At the end of the timeline the students could offer their 'advice' on how to prevent more damage to the peat moorlands and blanket bogs (slide 23 to help)



Activity 3: Pictures for the timeline





Activity 3: Key phrases and dates for the timeline

Before the 1800's the peat blanket bog was in excellent health with a wide variety of plants and animals (biodiversity).

By the 1970's the vegetation had been killed by acid rain from Manchester and the peat was disappearing from the moor. There was very little wildlife left on the moor.

By the 1990's over 1 meter deep of peat had disappeared from the moorland.

Rain water washed the peat away into the reservoirs and caused flooding on lower grounds ...and the wind blew the grains of peat away.

Millions of people using the paths eroded the peat even more!

Some methods to protect the peat failed!

Stone slabs were laid across the peat to prevent the walkers from eroding the ground.

Dams were built to stop the water washing the peat away.

As the old disused factories and mills from the big industrial cities were demolished the stone slabs were brought to the moorland and *reused* on the bare peat to make hard wearing paths.

Heather and sphagnum moss were planted to protect the peat and help to make the blanket bog wet again!

Biodiversity improved as new plants like cotton grass started to grow on the moorland again.

Before the Industrial revolution 1800's

2003

The health of the blanket bog and moorland had improved so much that bats are seen on the moor for the first time in over 100 years.

1970's

1990's

2013

2022