Why is peatland important?

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Executive summary

Peatlands are habitats that occur on acidic peat soils and are formed when waterlogged conditions prevent the decomposition of sphagnum moss and other plants. Peatlands are generally split into two categories – wetter habitats that occur on deep peat and drier habitats that occur on shallower peat. Peatland restoration typically focusses on habitats on deep peat.

Almost all of our heathland and blanket bog habitats have been degraded through historical management regimes. When in poor condition, peatlands release carbon to the atmosphere, contribute to extreme rainfall-runoff events, contribute to poor water quality, and support fewer plant and animal species. When in good condition, peatlands:

- store carbon, instead of it being released to the atmosphere
- hold large amounts of water, helping to regulate water flows, and reduce the severity of potential flooding
- reduce erosion and sedimentation of watercourses, improving water quality
- support some of our most valued species and form a distinctive part of Cumbria's landscape character

Methods for restoring peatlands generally aim to restore natural processes using three key approaches:

1. Retaining water and sediment on site.
2. Increasing vegetation cover and species composition.
3. Enabling recovery through long term management.

Calculating the area of peatland in Westmorland and Furness is complex as there are many different parameters that could be used to define 'peatland'. The Natural England Peaty Soils map estimates there to be 64,132 ha of deep peat in Westmorland and Furness. The LNRS map estimates there to be 57,574 ha of blanket bog, heath, lowland raised bog, and fen, although this is not necessarily linked to peat depth. If restorable habitats or shallow peat and peaty pockets are included, there is estimated to be between 135,997 ha and 140,599 ha of peaty soils/restorable peatland habitats in Westmorland and Furness.

The LNRS aims to restore 10,000 ha of blanket bog and valley mire, 3,250 ha of lowland raised bog, 2,000 ha of lagg and wetland habitat, and re-create 10,000 ha of heathland across Cumbria by 2035, and to maintain these habitats under appropriate long-term management. Whilst this will help to realise the wider environmental benefits from peatland restoration, to truly deliver landscape scale change for our peatlands will require restoration and management at a scale that is beyond current resources, but this should nonetheless be a long-term ambition for the future.

1. Introduction

1.1. What are peatlands?

Peatlands are habitats that occur naturally on acidic peat soils. Peat forms when waterlogged conditions prevent the decomposition of sphagnum moss and other plants. This can occur in both the uplands and lowlands.

Peatlands are generally split into two categories – wetter habitats that occur on deep peat (>0.4m depth) and drier habitats that occur on shallower peat deposits. Peatland restoration typically focusses on habitats on deep peat.

1.1.1 Habitats on deep peat

There are three main habitats that should typically occur on deep peat:

- blanket bog and valley mire
- lowland raised bog
- fen

Blanket bog is a wet peatland habitat formed of sphagnum mosses, cottongrasses and dwarf shrubs such as heather and cross-leaved heath. Blanket bog is rain-fed and very nutrient-poor and typically occurs on flat or gently sloping ground with poor drainage. It can cloak large areas of our upland landscape and covers large parts of the Pennines and the Lake District.

Valley mire is similar to blanket bog but occurs on more sloping ground and is fed by flowing water as well as rainfall. This means that it receives slightly greater amounts of minerals and can therefore support a wider range of species. Found in a number of Lake District valleys, valley mire is relatively widespread in Scotland, but has limited distribution in England.

Lowland raised bogs develop primarily in localised lowland depressions where drainage is limited. Cumbria is one of the most important areas in England for lowland raised bog.

Fens are formed when groundwater, often rich in minerals, drains seeps into a depression in the landscape. Fens are much less significant in terms of their contribution to the overall extent of peaty soils in Cumbria. They can hold some very rich plant communities, however.

Upland heathland can occur on areas of deep peat which would have been blanket bog but have been degraded by drainage and/or burning. These areas can be a target for restoration to blanket bog.

1.1.2 Habitats on shallow peat

The most common habitats that should typically occur on shallow peat are:

- heathland

Heathland is dominated by heather and other dwarf shrubs such as bilberry and cross-leaved heath. Dry heath occurs on acidic soils, which are more freely draining than blanket bog. Wet heath occurs on wet peat soils that are shallower than those that support blanket bog and is characterised by the presence of deergrass, common cottongrass and sphagnum moss alongside the dwarf shrubs.

Lowland heathland is uncommon in Cumbria, but examples can be found on the sandstone hills in the Eden Valley, and on the limestone hills around Morecambe Bay.

Areas of shallow peatland that have been managed for sheep grazing are often classified as grass moorland, or upland acid grassland. These areas often have the potential to be restored to heathland under a modified management regime.

1.2. Why do peatlands need to be restored?

Almost all of our heathland and blanket bog habitats have been degraded through historical management regimes, the results of which are still very visible today. These activities include:

- Digging of drainage grips to lower the water table and increase agricultural productivity.
- Burning to promote fresh heather growth for red grouse.
- Extraction of peat for fuel and compost.
- Planting of forestry for timber production.
- Heavy grazing by livestock, leading to the dominance of grass species and the conversion of heathland and blanket bog to upland acid grassland and rush pasture.

The effects of these management changes have been:

- Lowering of the water table, resulting in the dominance of grass species that are more palatable to livestock, the loss of peat forming species such as sphagnum moss, and increased runoff rates following rainfall events.
- Erosion and/or loss of vegetation, leading to the exposure of bare peat, which further erodes, emitting carbon to the atmosphere and increasing the amount of particulate matter in watercourses.
- Removal of peat, resulting in bare peat faces which further dry out and erode, emitting carbon to the atmosphere and increasing the amount of particulate matter in watercourses.

- Decline in habitat condition, or conversion to non-peatland habitat types, resulting in the loss of biodiversity.

When peatlands are in good condition, they act as an important carbon sink, absorbing and storing carbon from the atmosphere, however, when in poor condition peat releases carbon to the atmosphere, contributing to climate change. Peat-forming sphagnum mosses are critical for healthy bogs and wet heaths. However, they require wet conditions and are therefore extremely susceptible to drying out from both drainage and burning of peat; this is compounded by the effects of climate change, particularly in the summer months. They are also very susceptible to trampling by livestock and deer.

1.3. What are the benefits of peatland restoration?

When in good condition, plants within peatland habitats decay in waterlogged conditions and the carbon in them is stored within the peat instead of being released to the atmosphere. Restoring our degraded peatlands is therefore a key tool for **sequestering carbon** and reducing our contribution to climate change.

Wet peatlands in good condition are also **more resilient** to the risks associated with climate change such as wildfires. As these risks increase, peatlands are considered a more reliable carbon store than woodlands because their carbon is stored below ground rather than above ground and is retained within the bog for much longer than the lifespan of most trees.

Peatlands can hold large amounts of water, both in the soil and in plants such as sphagnum moss. Because of this they can help regulate water flows, slowing and absorbing water during heavy rainfall and then releasing it slowly. By acting like a natural sponge, peatlands can help to reduce the severity of potential flooding through **natural flood management**.

Damaged peatlands release soil particles and nutrients into nearby rivers reducing water quality. Where these habitats are in good condition, stable vegetation cover reduces erosion and sedimentation of watercourses. Therefore, restoring peatlands can **improve water quality** and reduce the cost of treatment for drinking water.

Our peatland habitats form the largest extent of any of our semi-natural habitats. It is in these extensive areas that we have the greatest opportunity to create fully functioning ecosystems that contain all the naturally occurring wildlife-rich habitat types. Not only do they **support some of our most valued species**, but they also form a distinctive part of Cumbria's landscape character.

Peatland restoration is **widely supported**, with the majority of landowners willing to support restoration on their land. It also has minimal impact on food supply/security as the habitats targeted for peatland restoration are some of the least productive for agriculture.

2. Peatland condition

It is widely acknowledged that 80% of the UK's peatlands are in a degraded state[1] and require some form of restoration. However, the level of degradation, and therefore restoration requirements can vary significantly. The Peatland Code is one of several emerging voluntary standards for UK peatland projects wishing to market the climate benefit of restoration in the form of carbon credits. Peatland restoration projects calculate 'before restoration' and 'after restoration' scenarios using four key condition categories. The amount of carbon emitted to the atmosphere varies depending on the level of peatland degradation and is represented by a CO_2 emission factor[2], allowing the carbon savings as a result of restoration to be calculated. The different condition categories and their emission factors are shown in Table 1.

Table 1: Broad peatland condition types and CO_2 emission factor

Category	Emission Factor (tonnes CO_2 emitted/ha/year)
Actively Eroding	17.72
Drained	2.51 - 3.32
Modified	2.51
Near Natural	0.32

Peatland restoration projects typically focus on restoring peatlands that are either drained or actively eroding, however improving the condition of our modified peatlands is also an important part of landscape scale restoration and nature recovery.

3. Methods for restoring peatlands

Methods for restoring peatlands generally aim to restore natural processes using three key approaches:

1. Retaining water and sediment on site.
2. Increasing vegetation cover and species richness.
3. Enabling vegetation recovery through long term management changes (e.g. reductions in grazing).

[1] Peatland Code (2018). UK Peatland Strategy 2018 – 2040. Available at: UK Peatland Strategy 2018_2040.pdf

[2] Peatland Code (2024). Field Protocol: assessing eligibility, determining baseline condition category and monitoring change. Version 2.1. Available at: FieldProtocol_V2.1_Final Website_1.pdf

Restoration methods vary depending on the site size, location, topography, and level of degradation. Exact restoration requirements should be determined through a detailed site-specific restoration plan, that has been developed in collaboration with a specialist peatland restoration contractor.

Methods for retaining water and sediment on site can include:

- grip blocking
- bunding
- installing dams in gullies
- coir matting
- hag reprofiling

Methods for increasing vegetation cover and species composition can include:

- patch turfing
- mulch/brash spreading
- seeding and plug planting
- sphagnum inoculation

Changes to long term management can include:

- appropriate grazing regimes and stocking levels
- appropriate heather management that does not harm important habitats and hydrological function (e.g. avoiding using controlled burning as a management method)
- removing planted and self-sown trees and scrub
- reduced input of medication, pesticides, and biocides into the environment
- low nutrient input

4. Peatland in Westmorland and Furness

4.1. How much peat does Westmorland and Furness have?

Calculating the area of peatland in Westmorland and Furness is complex as there are many different parameters that could be used to define ‘peatland’. In its simplest term, the England peaty soils map can be used to identify areas of deep peat, shallow peat, and peaty pockets. However, this dataset is not always entirely accurate at a site scale; in particular the ‘peaty pockets’ part of the dataset can cover large areas but contain very little actual peat. This dataset doesn’t reflect habitat type or condition. Natural England are in the process of developing an updated England Peat Map, which is due for publication in 2025.

The Local Nature Recovery Strategy (LNRS) mapping can be used to identify the habitats that naturally occur on peat. However, this dataset is made from a range of different data

sources of varying age and quality and does not distinguish between shallow and deep peat. This dataset can be used to calculate blanket bog coverage within Westmorland and Furness, but this doesn't distinguish between areas of heathland on shallow peat, and areas of heathland on deep peat that could potentially be restored to blanket bog. Table 2 outlines the various estimates for peatland cover in Westmorland and Furness, using the Natural England Peaty Soils and LNRS Nature Recovery Networks datasets.

Table 2: Different datasets and their estimates for peatland cover in Westmorland and Furness

Dataset	Parameter	Area (ha)
Natural England Peaty Soils	Deep peat	64,132
	Shallow peat	60,808
	Peaty pockets	11,057
	Combined	***135,997***
LNRS Nature Recovery Networks	Blanket bog	36,861
	Heathland	15,802
	Lowland raised bog	1,430
	Fen	3,481
	Restorable moorland, heathland and montane	83,025
	Combined	***140,599***

Neither of these datasets account for condition and will include all condition types from 'near-natural' to 'actively eroding'. Approximate condition can be assessed from aerial imagery but needs to be done on a site basis rather than county or council scale. Whilst most of our peatland will benefit from long term management to enhance condition, a much smaller area will require restoration in the form of interventions to retain water and sediment on site and increase vegetation cover and species richness.

4.2. What is happening to restore peatlands in Westmorland and Furness?

The Cumbria Peat Partnership (CPP) is a group of stakeholders with an interest in peatland habitats in Cumbria. The CPP, established in 2013, is hosted by Cumbria Wildlife Trust and aims to share knowledge, develop best practice and actively support the restoration of all peat habitats in Cumbria. Between 2013 and 2024, the CPP has surveyed a total of 10,250 ha and restored 4,621ha of peatland in Cumbria. The CPP has a target to have an additional 5,000 ha of peatland recovering and in favourable management by 2035.

The Cumbria LNRS has three priorities that relate to the restoration or enhancement of our peatland habitats. These are:

- Restore 10,000 ha of blanket bog and valley mire by 2035 (and maintain under restorative and sensitive management).
- Maintain, restore, or enhance 3,250 ha of lowland raised bog, and 2,000 ha of lagg and wetland habitat to be in good condition and under appropriate management by 2035.
- Re-create 10,000 ha of heathland and have 90% of the existing resource under appropriate management as part of a dynamic mosaic of upland habitats by 2035.

The LNRS targets have been derived using a combination of existing partnership and organisation targets, stakeholder feedback including Natural England, and the LNRS mapping. They are designed to be ambitious, yet realistic and achievable, and to build upon existing local and national nature recovery targets including the National Environmental Objectives in the 25 Year Environment Plan.

Whilst meeting these targets will help to realise the wider environmental benefits from peatland restoration, to truly deliver landscape scale change to our peatlands will require restoration and management at a scale that is beyond current resources, but this should nonetheless be a long-term ambition for the future.

4.3. Want to know more?

Further information on peatland restoration in Cumbria can be found at:

- Cumbria Peat Partnership - https://www.cumbriawildlifetrust.org.uk/about/what-we-do/groups-and-partnerships
- Yorkshire Peat Partnership - https://www.yppartnership.org.uk/
- North Pennines National Landscape - https://northpennines.org.uk/what_we_do/peatland-programme/