

Peatland

OPPORTUNITIES, BARRIERS AND LIMITATIONS | OCTOBER 2025

Overview

On the 18th September 2025, the LUNZ Hub hosted a 'Big Tent Event' in Venue Cymru, Llandudno. As part of the event a series of 'Ask the Expert' breakout sessions explored key topics for a sustainable and just land-use transition. This note outlines the key messages and discussion points from the breakout.

Peatlands are a major terrestrial carbon store, yet are badly degraded, being a major source of greenhouse gas emissions. The discussion examined whether restoration can realistically deliver a significant contribution to net zero targets, given the complexity, costs and uncertainties involved. The key question posed was; what does success look like? Peatlands are critical for climate mitigation but restoration is not a "quick win", with avoiding further loss the key rather than trying to rebuild carbon stocks in the short term. The difference between the impact of upland and lowland peat restoration and peatland management was discussed, alongside the multiple policy targets beyond carbon (nature recovery, water, flood mitigation) that restoration of peat contributes towards.

Panel contributors: Rachel Harvey, Eryri National Park Authority & Jennifer Williamson, UKCEH.
Chair: Bridget Emmett, UKCEH

EVIDENCE & INSIGHTS

Wales contains roughly 90,000 hectares of deep peat soils, yet more than half of this area has been damaged by past management, including drainage for farming or forestry. When peat is drained, oxygen reaches the stored organic matter, allowing it to decompose and release large amounts of greenhouse gases. As a result, peat degradation currently contributes almost half a million tonnes of carbon dioxide equivalent emissions each year in Wales.

To date, around 9,000 hectares have undergone some form of restoration management, with approximately 5,000 hectares focused on mapped deep peat. In practice, restoration activities extend beyond the officially mapped deep peat areas. This reflects efforts to improve habitat connectivity between sites, discrepancies in soil mapping, and the inclusion of restoration work on shallower peat and peat-influenced soils.

Valuable practical insight was brought to the discussion, highlighting the challenges faced when implementing

restoration projects on the ground — from dealing with difficult terrain and hydrological complexity to managing expectations about the speed and visibility of ecological recovery.

OPPORTUNITIES & CHALLENGES

Peatland restoration in Wales offers significant potential to reduce emissions and deliver a range of wider environmental benefits. Restoring degraded peat can prevent the release of stored carbon and, in some cases, gradually rebuild carbon stocks over time. The process also supports biodiversity recovery, improves water quality, and can help to mitigate flooding by slowing and storing water across the landscape.

However, restoration is inherently complex, expensive, and often slow to deliver measurable results. A major challenge is posed by the "hyper-modified" peatlands — the most heavily drained and intensively managed areas — which generate the highest greenhouse gas emissions per hectare. These sites represent a substantial mitigation opportunity if rewetted, but they are frequently among the most productive agricultural

lands, creating difficult trade-offs between emission reduction and food production.

Some peatlands may already be too degraded for full restoration to natural conditions, but even partial rewetting or reduced drainage can prevent further carbon loss. Restoration projects therefore need to be carefully prioritised — balancing ease of implementation with potential impact.

A key challenge to note is the majority of peatlands are privately owned, so it's vital that landowner engagement and support is part of the solution.

POLICY & PRACTICE IMPLICATIONS

Defining what success looks like for peatland restoration remains a challenge. Counting hectares restored tells only part of the story. Monitoring key indicators of peatland function — such as hydrology, vegetation, and carbon flux — will be essential to assess real outcomes and guide adaptive management.

Restoration is not a one-off intervention; sites, particularly those that have been highly modified such as former conifer plantations, may need revisiting as conditions evolve. Experience shows that even two decades after initial intervention, peatland condition can continue to change, underlining the need for long-term monitoring and maintenance.

Strategically, policymakers must consider where restoration offers the greatest balance between practicality and climate benefit — targeting areas that can be rewetted effectively while maintaining land-use viability. Flexible funding and sustained monitoring support will be key to maintaining progress and ensuring long-term success.

Peatlands are critical for climate mitigation, but restoration is not a “quick win.”

Reducing further loss can be achieved even if full restoration to natural peatland is not possible at a site.

Natural peatlands do store carbon but methane emissions from waterlogged soils reduce the overall climate mitigation effect.

Restoration contributes to multiple policy targets beyond carbon (nature recovery, water, flood mitigation).

Net zero contribution from peat is limited (5–10% of UK needs), but essential as part of the broader portfolio.

SUMMARY

Experts agreed that restoring peatlands is vital for climate, nature, and water, but expectations must remain realistic. Peatlands can slow and reduce emissions, yet restoration is a complex and long-term process that depends heavily on local conditions. Protecting intact peat and prioritising areas with the highest potential for emission reductions offer the greatest climate return. Policymakers should view peatland restoration as a necessary — though limited — component of the net-zero pathway, valued not only for its carbon benefits but also for the broader ecosystem and societal gains it delivers.

ABOUT LUNZ HUB:

The Land Use for Net Zero (LUNZ) Hub is a consortium of 34 organisations that aims to provide the UK government and devolved administrations with the rapid evidence they need to develop policies that will drive the land use transformation required to achieve Net Zero and other environmental and social targets by 2050.

Partners include experts from research, farming and industry, working across issues including green finance, renewable energy, planning, soil health, afforestation and water management. LUNZ will play a pivotal role in supporting policymaker decision making and helping to communicate more widely the critical importance of land as a carbon sink or source.



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