



Sustainable uplands

Where there's bogs there's brass

More carbon is stored in Britain's soils than in the forests of France and Germany combined. Mark Reed discusses a new way to protect this valuable carbon reservoir.

Britain's wild and rugged moors, mountains and valleys – the uplands – are some of the country's poorest and most remote areas. But they could be a key to helping us meet our carbon-reduction targets. And the work needed to make it happen may even pay for itself.

Approximately eight per cent of the UK is covered with blanket peat moorland. This blanket stores most of Britain's terrestrial carbon. In the last century this land has changed dramatically. Encouraged by the government, farmers and land managers have built many drainage ditches to make land more suitable for grazing and game management.

But these drainage ditches can enhance flooding and cause soil erosion, water discoloration and loss of wetland habitats. The practice has also damaged a valuable store of carbon, leading to more carbon emissions to the atmosphere.

My colleagues and I are working on the Rural Economy and Land Use programme alongside Aletta Bonn and Chris Dean from the Moors for the Future Partnership in the Peak District. We have shown how blocking drainage ditches and replanting vegetation on bare peat can lock up carbon from the atmosphere and potentially cut down the amount of carbon lost in brown stream water. With additional financial support from Yorkshire Water we conducted a national water quality survey of UK peatlands showing for the first time that where drain blocking has taken place water discoloration and carbon loss were much less compared to those areas where drainage ditches were left in place. We have also shown that replanting vegetation, especially Sphagnum bog mosses, can slow water flow across peat by at least ten times, reducing flood risk.

Making restoration pay for itself

This kind of restoration comes at a cost. We are working with the Moors for the Future Partnership to find ways for the scheme to fund itself.

Carbon offsetting projects are seen as one economic tool that could help reduce concentrations of atmospheric carbon dioxide. Under a new initiative to be trialled in Yorkshire this year, people can pay for peat-bog restoration to prevent carbon loss. At the same time this will protect and enhance biodiversity.

We are also working with Natural England and Yorkshire Forward's 'Carbon Action Yorkshire' project to get this internationally accredited as a carbon-offset scheme*. With appropriate management, we estimate that the majority of moorland could save enough carbon to pay back its restoration costs within 30 years. This makes it a good alternative to forestry-based schemes.

Britain's moorlands could help us meet our carbon-reduction targets.

In fact we calculate that if all damaged bogs in England and Wales were brought back to pristine condition, this would store carbon equivalent to two per cent of annual car emissions in England and Wales, or removing more than half a million cars from the road every year.

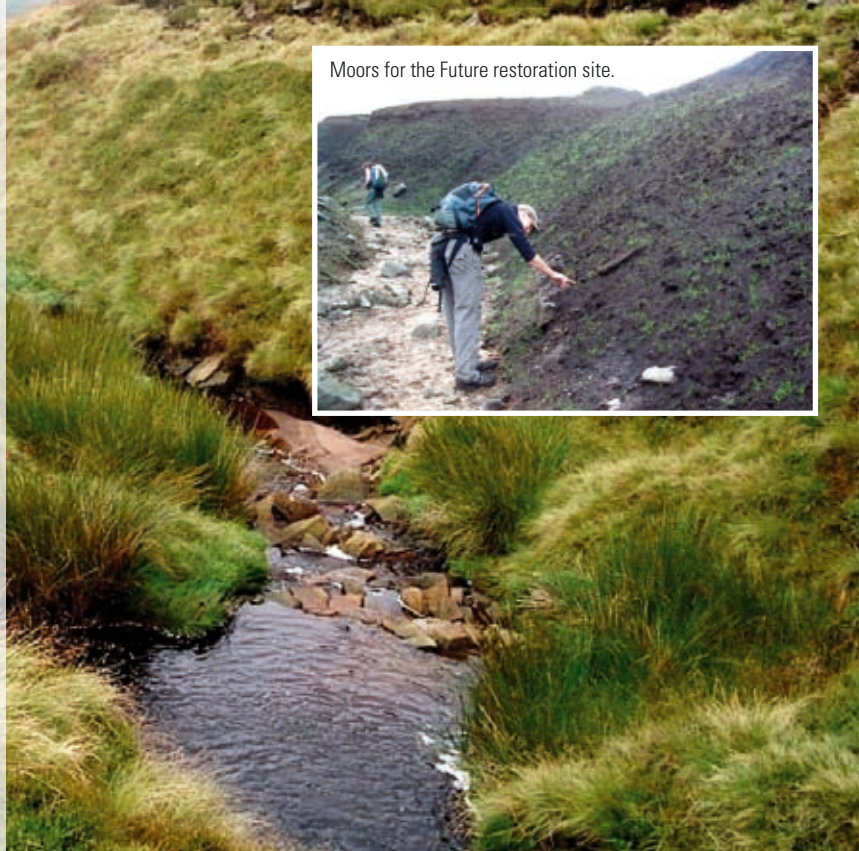
Championing stakeholder-led research

There are additional benefits to society. We have developed and carried out the research in collaboration with a range of stakeholders to make sure we address the questions that are of greatest interest and importance to them. Involving local people has enabled us to bring in a wide range of different perspectives. In this way we hope to create a more inclusive understanding which is important if the results are to be credible.

For example, some farmers have been worried that they could be turned into carbon managers, with possible adverse consequences for

'Water colour from upland sources has become a major problem in recent years and is getting worse. If we can reduce it before the water reaches treatment works, there will be potential savings for our customers because water treatment for highly discoloured water is an expensive process.'

Sarah Gledhill, Senior R&D Project Engineer from Yorkshire Water.



Water companies pay millions to clean up water that has turned brown.

the upland environment. While some welcome restoration because it prevents sheep becoming trapped in deep gullies, others have expressed fears that the boggy areas resulting from restoration could be a hazard.

Wildlife and water supplies are also important stakeholder concerns. We are using models to see how restoration affects red grouse and other birds valued for conservation, as well as water quality and quantity, and soil erosion. Importantly, we are taking into account how these effects might influence the decisions made by the people who manage the land.

The findings show that restoration may mean cutting sheep numbers in some heavily grazed areas. But evidence suggests that this will probably happen anyway as a result of climate change. Our models show that as temperature increases heather becomes more vulnerable to overgrazing, and so land managers are likely to respond by removing sheep from the moor.

Similar positive effects of restoration are predicted for water management. Currently, water companies pay millions to clean up water that has turned brown from the peat before piping it to households, so if restoration can help keep the water colourless, it could save them a fortune.

Future proof

We also want to 'future proof' our ideas. Alongside local people and policy-makers, we are investigating how a range of future events might affect how much carbon is stored, as well as the effects on the water, ecology and livelihoods of those who depend on the land. Such factors include climate change, the future loss of agricultural subsidies and pressure to use hill country to provide food and bioenergy – crops such as willow – in future.

The Moors for the Future Partnership has pioneered moorland restoration methods. Project Manager Chris Dean is enthusiastic about the potential benefits of the work. 'What excites me about the

restoration of the peatland is the capacity to bring back important habitats on a scale that has never been seen before,' he says.

'We have a chance to protect biodiversity as well as carbon stores, potentially regulate water quality and downstream flooding, and reduce the risk of wildfires across vast landscapes. There is also a really exciting opportunity to engage with the local population who could collectively, through offsetting payments, help support these landscapes and have a much closer supporting relationship with it.'

I agree. The carbon is what makes all this economically viable – for me, the fact that there is a climate benefit is actually a bonus.

And it fits in well with the bigger picture of our research. Ultimately it is about exploring what could happen to upland landscapes, and their communities, in the future, to help people influence those futures. ❖

**Under the Voluntary Carbon Standard*

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For more information about the Sustainable Uplands project: www.see.leeds.ac.uk/sustainableuplands

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