The historic environment in peatland restoration

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A drainage ditch being 'restored' using dams on Exmoor. Credit: Lee Bray © ENPA

Positive action to improve the condition of peat bogs has become a feature of UK governments' climate change reduction strategies. This is because peat bogs make major contributions to the extraction and long-term storage of carbon from the atmosphere, provided that they are functioning in the manner that allows this to happen. At the same time, both the quality and quantity of water can be managed, improving both drinking water quality and mitigating flood risk. Much is also made of the fact that the historic environment should also be a co-beneficiary of restoration, as areas with vulnerable wetland archaeology (for instance, the trackways of the Somerset Levels) would enjoy long-term preservation through maintenance of high water tables.

The historic environment isn't just a co-beneficiary of restoration activities: there is a tremendous amount that it can, and should, offer the peatland restoration community. The very features that are the focus of restoration actions (ditches and drains that are blocked to prevent the flow of water) are also an integral part of the historic environment themselves. At the University of Plymouth we are currently running the *Reclaiming Exmoor* project, funded by the Leverhulme Trust, to examine the historical processes and social context of moorland drainage. In 1818 the Royal Forest of Exmoor (a 20,000-hectare estate) was sold by the Crown to John Knight, who promptly set about draining the moors and peatlands, an action that continued until the late 19th century. The transformation represents one of the largest and most ambitious enterprises in Britain of its time, and has left an enduring legacy on the character of the upland. Account books survive that describe the precise timing and location of drainage, and we even know the names of the men who undertook the works.

The ditches are a tangible link to this incredibly important piece of social and agricultural history. Explicit recognition of their value to the historic environment is not always apparent within the restoration communities. Through concerted lobbying and the influence of bodies such as Historic England, historic environment specialists now sit on peatland partnership boards in south-west England, ensuring such features are both recognised for what they represent, and that they are recorded. In this way the social and industrial contexts of landscape transformation aren't

lost. Sadly, this still isn't the case for all peatland partnerships, although awareness is growing of the need for appropriate representation and consideration.

The matrix of the peat itself contains an invaluable, although under-utilised, resource for the peatland restoration community. It preserves a continuous record of the plants that formed the peat, can be used to reconstruct past climatic change (eg using peat humification methods, or analysis of microfossils such as testate amoebae), and even how much carbon has been stored at different points in the past. In other words, an archive unlike any other that is available. Much high-level science is undertaken in the present day, monitoring how modern peat bogs are functioning, and how they are responding to restoration. This can be complemented by macrofossil and microfossil analysis from the peat, supported by appropriate dating, so that monitoring over the past five to ten years can be extended to describe centuries and millennia of change. Through the use of additional proxies (eg charcoal analysis, spores from fungi that only grow on animal dung) we can assess the impact of various management practices on the long-term functioning of these bogs, something not possible from modern monitoring experiments.

Historic drainage ditches on Buscombe and Lanacombe on Exmoor. Credit: Historic England

Within our *Reclaiming Exmoor* project, we are able to see how the vegetation of the bogs responded to drainage, and in particular how abundant sphagnum mosses have been through time (important in carbon draw-down and storage). These plants, highly valued and a 'key performance indicator' in restoration practice, show considerable variation in the past, in part through land management practice, and in part driven by natural cycles of climatic change. Similar work in northern England has been undertaken by Julia McCarroll, whose PhD (completed in 2014 at University of Gloucester) focused on the utility of palaeoecological techniques to inform mire restoration work. Long-term trajectories of peatland vegetation can be communicated to conservation managers, in order to support site-specific and appropriate restoration targets. Such work is costly and time-consuming, but is a great example of where our longer-term historic environment archive can offer significant value to some of the major climate mitigation projects currently being undertaken across the UK.

References

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