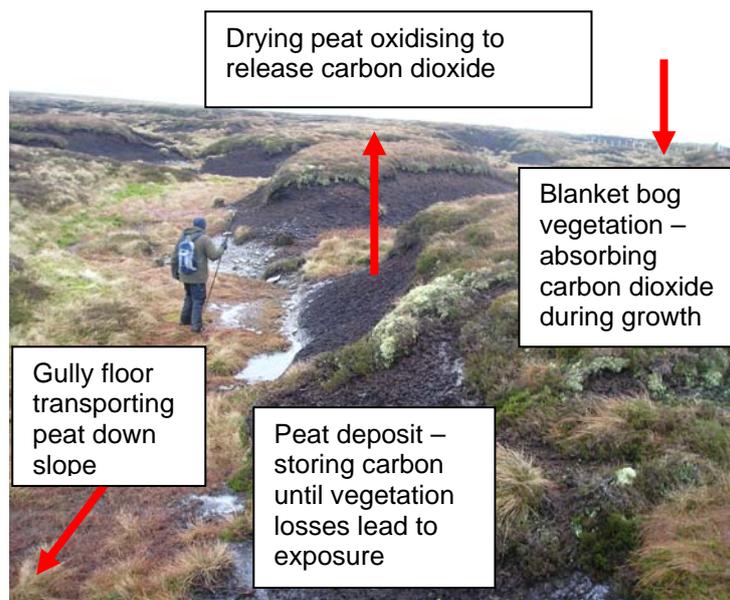


Carbon and peatlands

Peaty soils in the UK are a nationally important store of carbon. Although these soils cover only 3.3% of the land area of England and Wales, they contain half of the carbon. This makes peatlands the largest terrestrial carbon store in the UK. This carbon bank has taken almost 10,000 years to grow, as peat deposits have slowly built since the end of the last ice age. The ability of peatlands to capture and store carbon for long periods gives them a crucial role in efforts to reduce the impacts of climate change.

This peat soil resource includes blanket bog, which covers the Pennine plateau, but also thinner upland soils, covered by heather moorland, and deep lowland raised mires. The condition of peat soils varies across England and Wales. The balance in upland peatlands between carbon sequestration (driven by primary plant production) and loss (through erosion, leaching, soil respiration, bacterial decomposition) is not fully understood. In English blanket bogs, many areas are currently losing peat through erosion and restoration efforts have become a national priority.

Catchment scales studies (e.g. *Worrall et al 2003*) suggest that where peatlands are damaged through drainage, burning or over-grazing, sites may become a carbon source rather than a sink. This can amount to peat losses of up to 500 tonnes per square kilometre per year in some catchments. Where peatlands are healthy, usually capped by a continuous blanket of bog vegetation, they tend to function as a carbon sink, sequestering atmospheric carbon and locking it away.



Picture 1 – An eroding blanket bog in Weardale, North Pennines, showing some mechanisms of carbon transfer

The drying out of peatlands is likely to accelerate carbon losses and promote physical instability in peat deposits. Returning peatland sites to favourable condition through restoration activities including grip blocking will help to maximise the chance of peatland catchments being carbon sinks rather than sources. Restoration reduces particulate carbon loss through erosion which is an important factor in keeping the carbon locked in the peat. Hydrological restoration will also make blanket bogs more resilient to climate change.



Picture 2 Moorland drain blocking demonstration on Whitfield Estate blanket bog, Northumberland

The impact of land management on the carbon balance of upland peatlands is still unclear. The few published studies to date have focused on gross comparisons between managed and unmanaged sites e.g. the analysis of *Garnett et al (2000)* of long-term experimental plots at Moorhouse in the North Pennines Area of Outstanding Natural Beauty. Generally this work suggests no land management means more carbon storage. However new studies are starting to articulate how the subtleties of management intensity affect this balance. They will also explore how peatland management affects cycling of other powerful greenhouse gases e.g. methane. These studies should prove more helpful to land managers trying to minimize the impact of their management on the peatlands ability to store carbon.