

Precious Peat

UK Blanket peat bogs are amongst the most important and valuable wildlife habitats on earth. They are home to many important species of birds, thousands of rare insects and a wealth of unusual plants. Blanket peat, the common soil found beneath our moorland vegetation also contains almost the same amount of soil carbon as is found in the global atmosphere (Charman 2002). With mean global air temperatures predicted to rise due to increasing concentrations of carbon dioxide (CO₂) and other greenhouse gases in the atmosphere, it is essential that our moorlands are protected to help combat climate change and protect our environmental heritage.

Unfortunately, Peak District Moors have been eroding at a frightening pace and only sustained management can prevent further deterioration. Air pollution, sheep grazing pressure, uncontrolled fires, climatic change, recreational trampling and natural processes have been cited as causes of erosion. Resultant loss of vegetation and peat is an aesthetic issue, an agricultural and sporting issue an ecological issue and a long-term economic issue as water companies strive to remove colouration and sediment from reservoirs. CO₂ that has been locked up within 6000 years of blanket peat is being increasingly released into the atmosphere and into watercourses as dissolved organic carbon and particulate peat. Over the past 150 years carbon in the atmosphere has increased by 30% (ESA, 2005).

PEAT PERSPECTIVE

Peatlands are one of the largest terrestrial carbon reservoirs in the world. Through photosynthesis, plants absorb carbon, returning some of it to the atmosphere through respiration. Carbon that remains as plant tissue is then added to the soil when plants die and decompose. Within peatland ecosystems however, a 'sink' of CO₂ is caused by addition of plant material to the system that exceeds decomposition; plant material does not decompose in the waterlogged, airless, acidic conditions and organic material builds up as peat. This results in a net transfer of carbon from the atmosphere into the peat – carbon pool.

Rates of carbon sequestration (uptake of CO₂) can not be estimated with certainty (Mitra et al 2005) and depend on the height of peatland surface above the water table (Bubier et al 1993; Waddington & Roulet 1996), the decomposition rate of vegetation and peat depth and compaction (Garnett *et al* 2001). The carbon sequestering capacity of peatlands is under threat from land use practices, fires and climate change. Current loss of CO₂ from eroding and 'in-active' blanket peat bogs (those that are decomposing at a greater rate than plant material is being added to the system) has an impact on global warming (Melillo et al 1996). Organic carbon that has accumulated over thousands of years can be lost in days.

IMPORTANCE OF THE PEAK AND PENNINES

It is estimated that northern Pennines peatlands contain 75,000 tonnes of carbon per km² (750 tonnes per hectare) based on blanket peat with a vegetation cover of Calluna (heather)/ Eriophoretum (what is Eriophoretum?) and an average depth of 100cm (Garnett *et al* 2001). Blanket peat measuring between 200cm and 300cm may contain twice to a third more carbon. The rate at which carbon is currently absorbed from the atmosphere by all peatlands in the northern hemisphere, is estimated at 75 million tonnes (Clymo *et al* 1998) and in Britain undisturbed blanket bogs sequester in the range of 0.4 to 0.7t C ha⁻¹ yr⁻¹ (that is between 0.4 and 0.7 tonnes of carbon per hectare per year). ⁽¹⁾ (Gorham 1991 gives the figure of c.0.55t C ha⁻¹ yr).

It is therefore estimated that:

- The Peak District contains c.29,463 hectares of blanket peat (based on ESA vegetation maps).
- Over 22,097,250 tonnes of carbon is stored in the Peak District (based on the top 100cm alone). This amount could be doubled if the average peat depth is between 200 and 300cm deep (c.45,000,000 tonnes).
- Pennines catchments on average are losing 73g Cm⁻² yr⁻¹ (grammes of carbon per square centimetre per year) through managed fires alone (Garnett *et al* 2000).

There are approximately 6.5km² of totally bare and eroding peat and a further 26.8km² of partly bare and fragile blanket peat in the Peak District, totalling 33.3km² (3330 hectares) (Anderson *et al* 1998).

- 2,497,500 tonnes of carbon may have been lost through erosion over the past c.500 years
- The Peak District is losing approx. 4840 tonnes of carbon per year
- If the trend was reversed and we created 'active' peat bogs, 1831.5 tonnes of carbon per year would be taken up in the Peak District alone.

A GLOBAL PROBLEM AND A UK RESPONSE

CO₂ is one of the six greenhouse gases identified by the Kyoto protocol that must be reduced from 2008-2012. The UK has already agreed to reduce greenhouse gases by 5.2% from 1990 levels and increasingly companies will be legally bound to comply with Kyoto. In order to meet targets, the UK must make changes to its own level of emissions by working closely with high energy consuming companies and organisations. Emission reductions are measured in tonnes of carbon dioxide equivalent emission reductions or "carbon credits". Carbon removed from the atmosphere must be through an eligible sink activity, a key one of which is revegetation. This will generate credits known as **removal units** (RMUs). Greenhouse gas *emissions* from eligible activities in turn must be offset by greater emission cuts from individual organisations.

Moors for the Future is a major corporate partnership project hosted by the Peak District National Park Authority involving over £3million Heritage Lottery funding towards costs of £4.7million over 5 years. It provides an integrated, sustainable approach to moorland conservation, understanding and enjoyment. The Moors for the Future team has been carrying out essential re-vegetation on areas of bare blanket peat, totalling 451 hectares. Recent restoration work has shown that it is possible to stabilise erosion and restore vegetation on bare ground. Techniques adopted include:

- Heather restoration (using heather brash)
- Application of a nurse crop (sowing agricultural grass seed to stabilise the peat surface)
- Geo-jute (bio-degradable netting placed on eroding peat banks to stabilise the surface).
- Water Management (gully blocking to stop water draining off moorlands)

We hope to work closely with DEFRA to offer organisations and individuals the opportunity to offset their carbon footprint by supporting moorland restoration in the Peak District. The first stage of this process will be to undertake a thorough carbon audit of the Peak District and to assess the amount of carbon captured as a result of our restoration. It is vital for the future of this fragile ecosystem and to combat climate change that local communities embrace our work.

For more information about the project visit our web site at: www.moorsforthefuture.org.uk or e-mail us at moors@peakdistrict.gov.uk

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