



Could managed burning lead to increased carbon storage?

F. Worrall and G. Clay

Department of Earth Sciences, Durham University, Durham, DH1 3LE, UK
(fred.worrall@durham.ac.uk)

Peatlands are the UK's largest single terrestrial carbon store with more carbon stored in UK peatlands than in forests of Britain and France combined. Unlike most northern peatlands, the peat soils of the UK are heavily managed for recreation and agriculture. A typical management strategy on UK upland peats is the use of managed fire to restrict vegetation.

Fires are used on a 10-25 year rotation and are described as "cool" as they remove the crown of the vegetation without scorching the litter layer or the underlying soil. In this case the fire destroys primary productivity and limits litter production but produces char. Char is a low volume, highly refractory, high carbon content product while litter is a high volume, decomposable, lower carbon content product. The question is therefore, are there fire conditions under which the production of char causes more carbon to be stored in the peat than would have been stored if no fire management had been employed.

This study uses detailed vegetation studies from a long term monitoring site in order to assess litter and biomass production; in the laboratory experimental burns were undertaken in order to assess the amount and controls upon char production and the carbon content of that char.

Results of field and laboratory observations are used to model carbon accumulation under a series of fire management scenarios and the modelling shows that cool burns at long rotations could lead to higher carbon storage than if no fire had occurred. Further in several cases more carbon accumulation occurred even if less depth of peat

was generated