



Could managed burning of peatlands lead to enhanced carbon storage?

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Peatlands are the UK's largest single terrestrial carbon store with carbon stored in UK peatlands than in forests of Britain and France combined. Unlike most northern peatlands in the peat soils of the UK are heavily managed for recreation and agriculture and due to their proximity to major centres of population are under more anthropogenic pressure than most peatlands. A typical management strategy on UK upland peats is the use of managed fire to restrict vegetation. Fires are used upon a 10-25 year rotation and are described as "cool" as they are designed to 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. Therefore, the question is if there are 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 combines field studies of recent managed burns and wildfires along with detailed vegetation studies from a long term monitoring site in order to assess litter, biomass and black carbon 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 cools 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.