

Fire Interdisciplinary Research on Ecosystem Services: fire and climate change in UK moorlands and heaths (FIRES)

SEMINAR 2

The impact of wildfire on ecosystem services: relationships between wildfire, climate change and people

The University of Manchester, 24th June 2008

Session 3:

**How will a changed wildfire regime affect ecosystem services?
What are the research needs**

Soils breakout group

Rapporteur's Report of Discussion

Stefan Doerr, Swansea University

The discussion kicked off with the recognition that (i) it is not clear how wildfire regime will change in the future in response to climate and land management changes, and (ii) that many aspects of soil system functioning could be affected (e.g. C-storage, hydrology, resilience to erosion, fertility).

The remaining discussion then focussed *on peatlands and their role in carbon storage* on the basis that peatlands are recognised as an important terrestrial C store and one of the most vulnerable ecosystems in the UK in terms of wildfire impacts. The predicted future reduction in summer precipitation is likely to reduce peat water content, increasing both fire hazard and the damage when fire does occur.

A key question arose as **to the completeness of organic matter (OM) oxidation during peat fires**. Some OM may be pyrolysed into recalcitrant black carbon (BC), which, stored in soils and sediment, can act as a long-term C sink. Little is known about the amounts (and types of) BC produced during peat fires and this knowledge may be critical in assessing the impact of current and future wildfires on C fluxes in peatlands.

Overall, however, wildfires were considered to cause net C-loss from peatlands due to their comparatively large OM storage and their very slow growth (and recovery) rates. In addition to the direct combustion of OM, wildfire is likely to induce additional C losses through accelerating erosion processes in peatlands. This was seen as a strong argument in favour of the general prevention of wildfires in UK peatlands. This view also considers that peatlands present in the British Isles today are highly managed and not adapted to a natural fire regime. The general perception was also that the fires used for peatland management are probably rather detrimental in terms of their risk of turning into a wildfire, especially given climate change scenarios. However, the validity of this perception is a research question in its own right.

The discussion then moved on to research needs regarding fire prevention, detection and management. Key questions raised were:

- **How can detection be improved?** Remote surveillance; improved public awareness; better communication between authorities?
- **How can arson be reduced?** Improved public education; more severe punishment for arsonists; changes in legislation assigning a 'property value' to peatland, allowing prosecution of arsonists?
- **How can accidental ignition be reduced?** Better public awareness of the risks from discarded cigarettes etc; seasonal access bans?

The knowledge gaps highlighted above require research in areas of physical and human sciences and may, in some cases, be best addressed by joint initiatives involving both sets of disciplines.