FIRES Fire Interdisciplinary Research on Ecosystem Services:

Fire and Climate Change in UK Moorlands and Heaths

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Partners and Contributors

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- *Moors for the Future Partnership*
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- *Chief Fire Officer's Association*
- *Heather Trust*
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- *Game and Wildlife Conservation Trust*
- *Peak District National Park Authority*

Fire is historically important in moulding moorland and heathland landscapes. Managed rotational burning is used to maintain heather moors for grouse and grazing animals. In contrast, wildfire – accidental or malicious vegetation fire – increasingly threatens ecosystem services (ES). The environmental, social and cultural ES provided by moorlands and heathlands include carbon capture and storage (especially on peatland), biodiversity, water provision, flood protection, aesthetic/recreational value, and economic value from tourism, sporting enterprises, forestry and grazing. The series discussed the key but equivocal role of prescribed fire and wildfire, and the many controversies for management and policy making, notably in the policy panel at FIRES4.

The impact of fire on biodiversity, carbon budget and water colour is controversial. A key concept is that impact varies with fire regime, that is, with frequency, intensity and severity (itself a contested term), yet most research relates to single fires. New work is needed on changing fire regimes and their impact on ES. Ecological impact also depends on the baseline, time scale for recovery and management objectives. We need to know the optimum fire regimes to manage different ES, and how to prioritise between them.

Management of wildfire risk requires a combination of: fuel load reduction; reducing risk of ignition from human sources, such as controlling pubic access or urban expansion; increasing resilience of vegetation to dry conditions; and improving suppression. Fuel load management is critical. Managed fires can reduce wildfire risk by reducing fuel load, although if poorly controlled can become wildfires. Our speakers from Mediterranean countries stressed that complete fire suppression and land abandonment had allowed fuel load to increase, resulting in more severe fires. Current UK land management policy is also allowing fuel loads to become dangerously high. There is a need to review policies which prevent fuel load management, or even to reward land managers who reduce wildfire hazard indirectly protecting ES from wildfire.

Wildfire hazard reduction should be recognised as a significant 'natural' hazard in the UK. Including 'WF prevention' as an ES on the DEFRA impact grid. The FIRES4 workshop encouraged recognition of complex cross-sector impacts with other ES. A full impact pathway analysis is needed.

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Seminars

- *The role of managed fire in ecosystem services of UK moorlands and heathlands*
- *The impact of wildfire on ecosystem services: relationships between wildfire, climate change and people*
- *Forecasting and modelling wildfire risk for UK moorlands and heaths*
- *Economic impacts of wildfires, wildfire policy and the use of adaptive land management to reduce wildfire risk and impact*

Publications/Outputs

McMorrow J and Legg C (2009) Ways Forward for the Management of Fire in the UK; summary of the FIRES Seminars. Presented at Wildfire 2009, 16-17 June, Lyndhurst, http://www.wildfire2009.org.uk/presentations.html

Aylen J, Quinn C and Walker J. The Economic Impact of Wildfires: Costs of Suppression, Local Economic Impacts and Costs of Restoration. Presented at Wildfire 2009, 16-17 June, Lyndhurst, Hampshire.

Albertson K, Aylen J, Cavan G, McMorrow J (2009). Forecasting the outbreak of moorland wildfires in the English Peak District, Journal of Environmental Management 90(8): 2642-2651.

McMorrow J, Lindley S, Aylen J. Cavan G, Albertson K and Boys D (2009) Moorland wildfire risk, visitors and climate change: patterns, prevention and policy. In: Drivers of Environmental Change in Uplands, (eds.) Bonn A, Allott T, Hubacek K and Stewart J. Abingdon: Routledge, pp 410-431.

Legg C and Davies M (2009) What determines fire occurrence, fire behaviour and fire effects in heathlands? Proceedings of the 10th National Heathland Conference - Managing Heathlands in the Face of Climate Change Natural England Commissioned Report NECR014, pp 45-55.

Climate change is likely to mean more summer droughts and more frequent severe wildfires like those of 2003 and 1976. Warmer wetter winters are likely to bring increased fuel accumulation and fewer suitable days for prescribed burns. Research is needed on these and other complex effects of climate change on fuel, as well as on visitor numbers and other human responses. We need to know more about public attitudes to fire. Adaptive management, monitoring and frequent policy review will be required.

Fire and Rescue Services' (FRS) priority are structural fires, but there is growing concern about wildfires, as evidenced by the Scottish an English Wildfire Forums. Most FRS are poorly equipped and trained to deal with vegetation fires. Research and knowledge exchange on UK fire behaviour, especially for peat fires, is needed to improve the efficiency of fire suppression. Improved forecasting and modelling tools are required, adapted to UK conditions. The UK needs a much better evidence base. The new Incident Recording System requires a UK-wide standard for reporting vegetation fires, especially their spatial location.

Moorland wildfires are spatial scale events often lasting several days. They are costly and challenge FRS resilience to tackle other incidents. Prevention and suppression costs need to be set against the cost of avoided damage to ES. This requires a viable valuation mechanism for ES. Treating moorland and heathland ES as property assets with a monetary value would move wildfires up the FRS priority order of life, property and environment.

Partnership working in Local Fire Groups is an efficient and effective grass roots approach to the wildfire issue. It should be supported by central government.

The four seminars created a vibrant cross-sector multidisciplinary forum. Practitioners comprised more than half the audience. The series brought together over 130 researchers, policy-makers, FRS officers, land managers and other stakeholders. It was the first time the FRS had been involved in coordinated academic debate on UK wildfires. A policy brief is being prepared. FIRES raised awareness of the UK wildfire problem and its significance for ES. A clear need for further interdisciplinary research and knowledge exchange has been demonstrated.