

# Upland Water in the Rose Bowl - 19<sup>th</sup> January 2016

## Summary findings



This report presents a summary of discussions at a conference on upland water management held in Leeds in January 2016.

Delegates who attended the event were universally positive in their feedback. Of the 140 delegates, over 60 requested follow up events.

Debate was extremely wide ranging, but a number of over-arching issues emerged, including:

**Inadequate or conflicting evidence** – Hard evidence for some of the problems we face is lacking, and some of the evidence we have appears contradictory. A comprehensive, unbiased, systematic and accessible literature and practice review would help us in understanding each of the topics discussed.

**Cost benefit and cost apportionment** – Comparative valuations are very difficult because the uplands provide us with such a diverse range of benefits. Values associated with treating coloured drinking water can be quantified in an objective way; it is more difficult to agree on the values we put on carbon storage or landscape amenity.

**Scale of effectiveness** – We must be very cautious before we generalise from what we know about one catchment to another, and in upscaling our conclusions from smaller catchments to larger ones.

**Collaboration between those developing policy, managing the land and others** – For more sustainable management of upland water to be achieved it is essential that all involved parties work together. A catchment approach is necessary incorporating rural, urban, higher and lower ground.

### Rationale for and nature of the conference

- Upland water management is increasingly important given its role in drinking water supply, influence on downstream flows, carbon storage in upland peat, and the upland economy.
- This conference brought together leading practitioners, researchers and key organisations to discuss three key themes:
  - **Water colour and carbon**
  - **Natural flood management**
  - **The water industry and the upland economy**
- We set ourselves the task of identifying what we do know, what we don't know and what actions need to be taken to ensure sustainable management of our upland hydrology.
- The event was jointly organised by the Upland Hydrology Group and water@leeds with the support of the British Hydrological Society and NERC.
- In addition to representatives from the National Farmers Union, the Country Land and Business Association, the Environment Agency, the National Trust, Natural England, the Forestry Commission, the Moorland Association, and the RSPB, delegates came from 11 universities, five water companies, three rivers trusts and a wildlife trust, three local authorities, 12 consultancies and two national parks.
- This report provides only a brief summary of our deliberations. Our principal speakers' PowerPoints are available on the UHG website: [www.uplandhydrology.org.uk](http://www.uplandhydrology.org.uk)



## **Water Colour and Carbon**

Raw water colour in peat uplands is the result of dissolved organic carbon (DOC). It is a critical issue for water companies because of the expense of removing colour from drinking water, and colour in water also indicates that uplands are losing carbon. Increasing levels of colour in water is an issue across northern Europe and in parts of North America.

Several factors determine the amount of colour in water. These include changes in the chemistry of rainwater, land management regimes and climate change. We do not fully understand how these interact with one another.

**We know** - that DOC will continue to rise in upland peatland surface waters for as long as sulphate concentrations from atmospheric pollution continue to fall. In heavily polluted sites such as the south Pennines this increase is set to continue for a number of decades.



**We need to know** – if restoring peat bogs reduces colour, and also the impact of re-wilding and afforestation. Robust evidence would enable us to establish:

- Where within a catchment the hotspots will be, so that water companies can most effectively target resources.
- The microbial effects on water colour.
- The impact of extreme events such as droughts and floods.
- How DOC levels in ‘pristine’ bogs compare to levels in degraded peats.
- How land management choices will impact on water colour as our climate changes.
- A better understanding of the factors responsible for catchment variability.

### **What we need to do**

- Carry out long term monitoring at the catchment scale. We need to instigate standard protocols for monitoring to aid cross comparisons, and we need data to be openly accessible.
- Raise awareness of the extensive research in this area and the implications for everyone in relation to their drinking water quality.
- Consider DOC when addressing other environmental issues, e.g. flood attenuation, biodiversity management.
- Work better with landowners to understand management effects and to share knowledge.

## **Natural Flood Management**

The use of landscape features to attenuate flood risk is often referred to as natural flood management (NFM). NFM can be achieved when we restore natural 'water attenuating' processes. This can happen as a result of the way we manage land and soil, or through the installation of specific NFM measures such as bunds and leaky dams.

The severe floods over the winter of 2015/16 have focussed attention on how we might manage upland water more effectively to reduce devastating consequences further downstream. Pilot projects in Belford, Pickering, Holnicote and elsewhere have shown that NFM measures can have an impact over relatively small catchments, and have also demonstrated the importance of local community support for such initiatives.



**We know** – that NFM works well at certain scales and the approach can be applied in both rural and urban areas. It can also have an impact around estuaries and along the coast. NFM can deliver a wide range of benefits including reduced flood peaks over a longer lag time, reduced soil erosion, improved soil structure and biodiversity gains.

It is vital that everyone involved in this debate is clear that NFM is just part of our flood risk management toolkit. It doesn't replace the need for other 'hard engineered' measures.

## **We need to know**

- How to fund these measures.
- How to upscale NFM, as successful examples to date are located within relatively small catchments.
- How to evaluate these schemes to take into account multiple benefits such as pollution control, health benefits and an increase in biodiversity, and possible impacts on agricultural productivity.
- How to best deliver the Water Framework Directive and the Floods Directive in an integrated way.
- How lead Local Flood Authorities can be empowered and supported in delivering both Directives.
- The long term effectiveness of natural flood management measures and best practice in maintaining them so they will function for the foreseeable future.
- How these measures can be used to help us adapt to our changing climate.
- We need a better evidence and a long term monitoring base to demonstrate persuasively the effectiveness of NFM.

**What we need to do** – Support the concept of NFM! We need advocates to promote its value and share our understanding of the contribution NFM can make in the right places. Specifically we need to:

- Write up and disseminate case studies and best practice. The Environment Agency and others have made a start on this task.
- Make it easier for different organisations to work together on NFM at a strategic level. Aligning funding streams is a particular priority as it crosses many remits.
- Develop mechanisms whereby NFM measures can be funded through stewardship or other means so that farmers have a real incentive to help in the delivery of public goods.
- Use the catchment based approach to deliver at a catchment scale – and highlight recent flood costs to illustrate potential cost benefits.



## The Water Industry and the Upland Economy

The uplands are the principal source of water for many water companies and through their infrastructure and their activities companies can have a significant impact on the landscape and the economy of upland areas.

### **We know**

- Practical interventions, such as moorland restoration works, and regulatory instruments, such as Water Safeguard Zones, can deliver benefits.
- Farmers and other land managers have responded positively to agri-environment schemes since the mid-1980s and this has made a real difference on the ground
- “One size” approaches don’t work everywhere. Regional, local and farm level variation needs always to be taken into account

### **What we need to know**

- How do we make the best land management and policy decisions on the basis of limited amounts of hard evidence? Can researchers help to interpret diverse findings and present these in an accessible way?
- What pragmatic approaches and incentives would encourage water companies (and perhaps others) to play a larger role in delivering wider ecosystem services?
- What are the risks and benefits of re-wetting the uplands?
- How might different financial scenarios play out for those whose livelihoods are based in the uplands? For example, what different situations might we find ourselves in if the UK opted to withdraw from the EU, or indeed if we remain as members?

### **What we need to do**

- Come to a consensus around a shared vision for our 21<sup>st</sup> century upland landscapes, and the multiple outcomes we require of them. We can then adopt a more coherent approach to help us prioritise what goes where.
- Develop a more flexible, outcome-orientated approach for agri-environment schemes, recognising real world variation at regional and local scale. The rigid approach currently used by the Rural Payments Agency is not fit for purpose.
- Those paying for landscape improvement works need to get together with each other and with the land-holders to agree measures to be adopted on a site-by-site basis. One example cited at the conference was the need for better joint working between the Environment Agency and water companies. Experience to date suggests it is far easier to secure funds for capital works than it is to find money to sustain improvements in the longer term.
- We need to redouble our efforts to build strong links between practitioners, policy makers and the research community, and all parties should see themselves as coming to the table as equals. It is particularly important that everyone starts with a real understanding of the situation as it is experienced by those whose livelihoods are based in the hills.

