

## Wetlands as a systemic solution to manage land and water quality

Could wetlands provide multiple benefits for the environment and for water quality and what is needed to realise these benefits?



Photo by Anne Miller: Harvesting reeds for thatching at Ham Wall RSPB reserve

**Living With Environmental Change  
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**The Living With Environmental Change Partnership** brings together 22 public sector organisations that fund, carry out and use environmental research and observations. They include the UK research councils, government departments with environmental responsibilities, devolved administrations and government agencies. The private sector is represented by a Business Advisory Board.

**There is rising concern about the need to protect water quality at source, rather than relying on heavy inputs of energy and chemicals downstream for cleaning up abstracted supplies. This, together with a greater emphasis on the value of “natural capital”, calls for more systemic management of land and water, including natural solutions involving wetlands at the land/water interface. Water companies, regulators and landowners are all showing increasing interest in exploring the opportunities offered by wetlands to deliver benefits using Payment for Ecosystem Services and other novel solutions.**

## **What are wetlands and what benefits do they offer?**

**Wetlands provide systemic solutions that work with, rather than against, natural processes.**

### **Wetland approaches include, for example:**

- Making use of, or restoring, natural wetlands.
- Sustainable drainage systems (SuDS) that reduce surface flow rates and pollutant loads while enhancing the biodiversity and amenity values of water.
- Treatment wetlands that process and filter pollutants, facilitating compliance with the Water Framework Directive.
- Washlands that offer flood alleviation capacity as well as biodiversity enhancement, seasonal agricultural use, nutrient cycling and carbon storage.
- Buffer zones that create effective barriers between potentially polluting land uses and susceptible water bodies, assisting compliance with the Water Framework Directive.
- Integrated constructed wetlands that can remove pollutants, manage floodwater and provide wildlife habitats amongst a range of connected, planned co-benefits (now being incorporated into Water Sensitive Urban Design).

## **How and why might water companies use this kind of approach?**

**Water companies are obvious beneficiaries of systemic solutions, involving greater use of targeted wetlands, as they:**

- Take a long-term perspective, planning over long time scales.
- Share long-term asset management plans with regulators.
- Depend on both constructed and natural assets, and are taking an increasingly partnership-based approach with other companies and stakeholders across catchments. Wetlands may provide lower-cost source protection solutions compared to “downstream” engineered alternatives.
- Have experience of successful schemes, eg South West Water’s Exmoor Mires project; Wessex Water’s Somerton Reed Beds and Poole Harbour Catchment programme; Dŵr Cymru Welsh Water’s RainScape project at Llanelli.

## **What elements are required to develop a successful partnership for achieving this kind of systemic solution?**

**Planning at catchment level is essential to identify what type and location of wetlands will optimise a range of interconnected benefits.**

Partners need to:

- Be clear about what commodities may be traded (eg water quality improvements or water retention capacity), who is selling (usually land owners), who is buying, and how the benefit is to be measured and rewarded.
- Identify trusted intermediaries, such as The Rivers Trusts, which can facilitate market development and success.

## What questions do the land manager, landowner and their advisers need to consider?

**Individual landowners and tenants need to know how this type of systemic solution will fit their long-term plans as well as shorter-term income requirements.**

For example:

- Can a wetland add value to land that currently is minimally productive?
- Are there long-term consequences of the scheme for productivity and animal welfare?
- Will the scheme affect the asset values and return on capital and the tax position, including eligibility for tax relief or inheritance tax?
- How secure will any payments be and over what time scale?
- How will the scheme affect diversification opportunities such as renewable energy?
- Who else should be involved: tenants, landlords, graziers, mortgagees or trustees?

## Who benefits?

**The improvements in water quality, flood management, carbon storage, wildlife habitats and related services that can be achieved by wetlands have multiple benefits.**

Potential beneficiaries would include:

- Water companies.
- Government bodies and agencies and local authorities.
- Utility providers seeking future resilience, including energy companies, pipeline operators, highways agencies and railway companies.
- Individual landowners and farmers as well as large landowners in the public and third sector, such as Church and Crown Estates, National Trust, MoD, NHS, Forestry Commission, Woodland Trust and other woodland owners, through diversified and secure longer-term income streams.
- The finance sector, for example banks (including the Green Investment Bank) and pension funds seeking longer-term security and which can diversify into funding such schemes.

## How can these diverse groups be encouraged to participate?

**Building partnerships takes time and the right environment requiring:**

- Facilitators who can build trust amongst stakeholders.
- Information that is clear and jargon-free and tailored to the different audiences.
- Sharing of practical and local as well as scientific knowledge.
- Some quick wins that can influence the public and land managers' perceptions.
- Avoiding a buyer-dominated approach – alternative models such as community funding may be more influential.
- A transparent model that gathers evidence and measures results so that progress may be judged fairly.

## What are the challenges/barriers to involvement?

**There are still barriers to be overcome before wetlands can be widely developed as systemic solutions because:**

- Regulators, planners, developers and the public have a low level of awareness of how these could drive improvements in water quality, and may be risk-averse about non-engineered solutions.
- Organisations, especially at local level, are reluctant to risk trying new approaches unless this kind of action becomes a political priority and is resourced.
- Timescales for financial planning, farming succession and the political landscape may not coincide, making long-term planning difficult.
- Individuals and organisations don't necessarily see the value of investment in natural assets, and valuations (which necessarily include monetary and non-monetary benefits) may be contested.
- Organisations may be reluctant to share data about issues such as water quality that could help the process.
- Some of the greatest challenges are likely to be in changing culture and behaviour across a range of organisations and stakeholders.

## What actions are needed to put wetlands on the national agenda?

### Policymakers need to:

- Recognise the opportunities, impacts and multiple benefits of this approach and give clear guidance about these to key stakeholders.
- Provide kick-start funding to facilitate partnerships and overcome barriers, and also to assess and publicise scheme successes.
- Offer leadership through establishing wetland solutions on publicly-owned land, nationally and locally, disseminating learning and also influencing other landholding organisations.
- Purchase beneficial services from wetland systemic solutions when they are implemented on privately-owned land.
- Endorse and actively promote education and understanding about ecosystem services, from school level through to postgraduate and professional programmes.
- Use the current development of the new environmental land management scheme to ensure the Common Agricultural Policy addresses and offers incentives for effective water resource management across landscapes, building on experiences such as the Glastir scheme in Wales.

### Businesses, such as water companies, need to:

- Identify opportunities to benefit services, such as water purification and flow buffering, that stem from wetlands.
- Support and promote collaborative research to develop a variety of mechanisms that enable wetland solutions.
- Monitor and evaluate the success of a range of wetland management schemes to develop best practice case studies and guidance, and actively promote knowledge exchange between different bodies in different places.

### Researchers and research funders need to:

- Improve valuation systems for services of wetlands as natural assets.
- Collate learning, from both successes and failures, about these kinds of wetland solutions and publish relevant data in usable forms.
- Explore mechanisms that could address the challenges around taxation and diversification faced by farmers and landowners who implement wetland solutions.

### Organisations representing land managers and their advisers should:

- Promote collaborative learning amongst farmers, landowners and utility companies to develop operational models that fit different contexts.
- Strengthen landowners' and managers' understanding of their role as resource sellers and the benefits to them of applying different wetland solutions.
- Develop targeted literature for landowners/advisers.

## Further information

This note was written by Dr Anne Miller and Dr Mark Everard drawing on a workshop in February 2014 funded by the Environmental Sustainability Knowledge Transfer Network and Landbridge, and supported by the University of the West of England, the Royal Agricultural University and the Environment Agency.

### Useful resources:

Information from the February 2014 workshop on this topic is available at: <http://tinyurl.com/systemic-solutions-workshop>  
 Everard, M. and McInnes, R.J. (2013). Systemic solutions for multi-benefit water and environmental management. *Science of The Total Environment*, 461-462, pp 170-179. <http://goo.gl/elvsjg>  
 Valuing Nature Partnership: <http://www.valuing-nature.net/>  
 The UK National Ecosystem Assessment (including the UK NEA Follow-on programme): <http://uknea.unep-wcmc.org/>  
 Innovate UK: <https://interact.innovateuk.org/>  
 Landbridge: [www.landbridge.org.uk](http://www.landbridge.org.uk)  
 Wessex Water Scheme Poole Harbour Catchment Plan [www.pooleharbourcatchment.co.uk](http://www.pooleharbourcatchment.co.uk)

Dwr Cymru Water RainScape, Llanelli <http://goo.gl/whNLMW>  
 Welsh Government Glastir Scheme <http://gwlad.wales.gov.uk/schemenews/140530-glastir/?lang=en>  
 Exmoor Mires Project: <http://www.upstreamthinking.org/index.cfm?articleid=8699>  
 UKWRIP Water and Cities report 2014 <http://www.ukwrip.org/action-groups/water-and-cities>  
 LWEC Policy and Practice Note No 1 Payment for Ecosystem Services: what does it mean for the future of our environment? <http://goo.gl/rurCrq>  
 LWEC Policy and Practice Note No 8 Catchment partnerships – better planning for our rivers and landscapes <http://goo.gl/RABNJM>  
 LWEC Bid for Clean Water video: <http://www.lwec.org.uk/video/bid-clean-water>  
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