



# Nature's Place for Water

Working with nature to reduce flooding



# A new approach to flood management

In 2007, the country experienced the most severe inland floods since 1947. Thousands of people were forced from their homes during the wettest summer since records began in 1766. Whilst these floods were exceptional, it's clear we need to be much better prepared for the future. The effects of climate change mean that the floods of June and July 2007 could happen once a decade by 2080. We need to help wildlife and people adapt to this increasing risk. Reducing flood risk is about two things – slowing down and storing water. Natural ways to manage flood risk can do both, and bring a host of other benefits for people and wildlife too.



Coombe Hill Nature Reserve with flood damage

Margaret McGlone

## The impact of unseasonal flooding on wildlife

Gloucestershire Wildlife Trust's three nature reserves in the Severn Vale were severely affected by the floods of May, June and July 2007. The reserves usually flood during the winter months, but these floods occurred at the height of the breeding season, washing away eggs and chicks of threatened species such as lapwing and redshank. Stagnant water remained on the reserves for up to seven weeks, rotting vegetation and suffocating invertebrates. The Trust has identified the Severn Vale as a 'Wildlife Highway'. It is working to create opportunities to link the existing sites and provide more varied habitat for vulnerable species to move and so help them to combat pressures from climate change.

## THE LIVING LANDSCAPE APPROACH

The Pitt Review report of the 2007 floods concluded that the extent of recent flooding was exacerbated by unsustainable management of land and water.

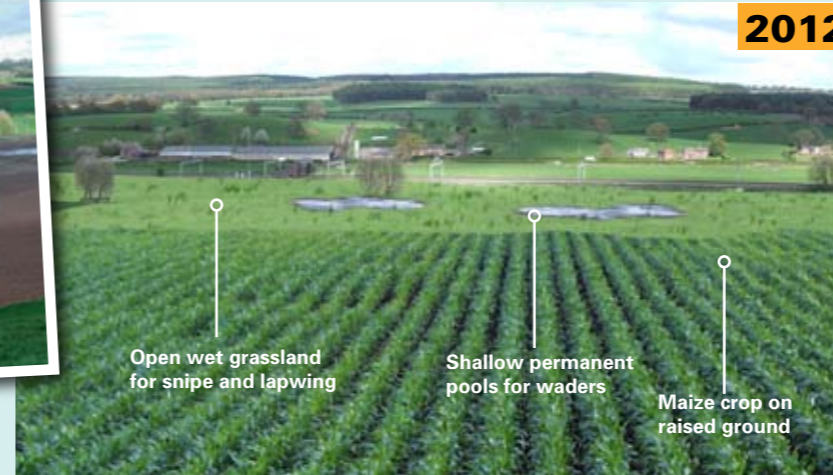
In the past, the landscape around towns and cities and in the uplands absorbed water like a sponge. Today, rain falling in the uplands often cannot soak into the ground, because drainage and erosion has damaged peatlands, and soil has been compacted by intensive grazing and farming. Housing and arable land have replaced wet grassland and grazing marsh on floodplains, taking away natural storage spaces for water. Unlike gardens or wasteland, paved front gardens, car parks and buildings in urban areas cannot absorb water. Intense rainfall quickly overwhelms urban drains. In the rush to increase agricultural production and expand towns and cities, water has been squeezed out of its natural space.

We need a long-term vision for our landscape that will help us create a resilient and healthy environment, including making space for water once again. The Wildlife Trusts are identifying key areas to protect for wildlife, and enlarging, improving and joining them up across the UK. Taking a sustainable, catchment approach to managing flood risk is part of the Living Landscape vision.

The Wildlife Trusts are working on projects in partnership with hundreds of other landowners. Many of these projects will restore the landscape to help slow down water in the uplands, re-creating wetland areas and re-connecting rivers with their natural floodplains in lowland areas to help store flood water. Trusts are working in urban areas to create more green spaces that also absorb and store flood water. Better management of natural processes will also provide vital habitat for some of our most threatened species, as well as providing wildlife-rich, open spaces for communities to enjoy.



2008



2012

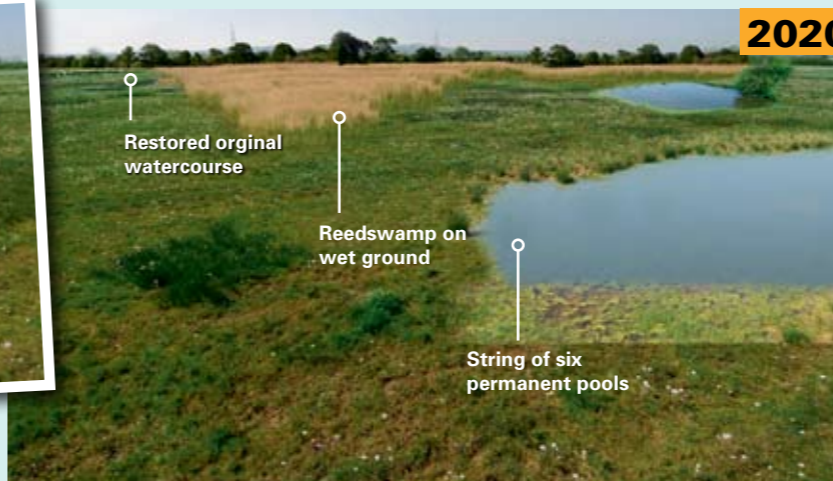
Open wet grassland for snipe and lapwing

Shallow permanent pools for waders

Maize crop on raised ground



2008



2020

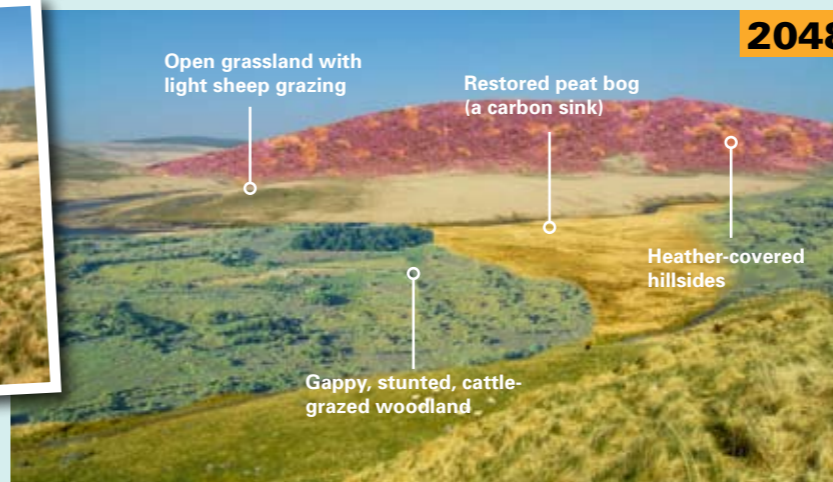
Restored original watercourse

Reedswamp on wet ground

String of six permanent pools



2008



2048

Open grassland with light sheep grazing

Restored peat bog (a carbon sink)

Heather-covered hillsides

Gappy, stunted, cattle-grazed woodland

## Staffordshire Wildlife Trust Farming floodplains for the future

"This is part of a 21-hectare field on a dairy farm near Newcastle-under-Lyme. It slopes down to an engineered and straightened river, and is managed as a mix of grassland and maize. Unfortunately for the farmer, the bottom third of the field floods; last year he couldn't harvest his crop of feed maize. Working with the farmer, we're taking material from the flood-prone area and using it to raise the rest of the field. It's a reasonably straightforward way of reconnecting the floodplain to the watercourse and should store several thousand cubic metres of water when the river overflows. We'll keep it quite open, because there are snipe, lapwing and yellow wagtail already here. So we get a gain for biodiversity, the farmer gets more manageable land and the effects of flooding downstream are reduced."

**Matt Jones, wetlands officer**

## Berkshire, Buckinghamshire & Oxfordshire Wildlife Trust Ray Valley restoration project

"Gallows Bridge Farm, near the A41 at Bicester, is the sixth reserve in a cluster which the Trust has been buying since the 1980s. This particular pasture field is about half a mile long, with a straightened, deepened brook along the far edge – but the old meandering waterway is still visible. The plan is to make a sluice in the brook to raise the water level, and allow the old watercourse to find its own depth and width. We'll also make a line of large ponds for wading birds. The primary objective is to store floodwater, knowing Bicester and Oxford downstream were affected in 2007. At the moment, we can't say how much semi-natural areas can store, so this will help us find out. It's also part of a 7,300-hectare wetland complex with plans for superb public access."

**Nigel Phillips, head of acquisitions and landscape projects**

## Wildlife Trusts Wales Pumlumon flood water management initiative

"This (inset) is a typical view in the 40,000-hectare Pumlumon project area in mid-Wales. Here, intense farming and grazing has created rapid run-off into water courses, contaminating water with nitrates and causing soil erosion and sedimentation. Costs are rising, and upland farmers need to find new ways to manage the land for produce. The Pumlumon project has two products – carbon storage and flood management. We're working on a trial area of 1,000 hectares blocking drains, restoring habitat and introducing cattle. The new vegetation will help to slow water down, reducing flooding downstream in the Severn Valley around Gloucester and Tewkesbury. I hope we're creating a new support network for the UK's upland farmers. If society wants it, farmers can supply it."

**Clive Faulkner, conservation officer**

# The future: Taking a catchment approach

How Sheffield and Yorkshire Wildlife Trusts are restoring natural systems in the River Don catchment in South Yorkshire

In South Yorkshire, severe flooding in 2007 affected the urban centres of Sheffield, Rotherham and Doncaster, flooding approximately 6,000 homes and businesses. Sheffield and Yorkshire Wildlife Trusts are working to improve the environment for the benefit of wildlife and the people living in the River Don catchment. Some of the projects are at the development stage; others are nature reserves which have been in situ for years. These examples show what could be applied more widely across the catchment and could make a real difference to reducing flood risk at the local level.



Manor Park sustainable drainage system.

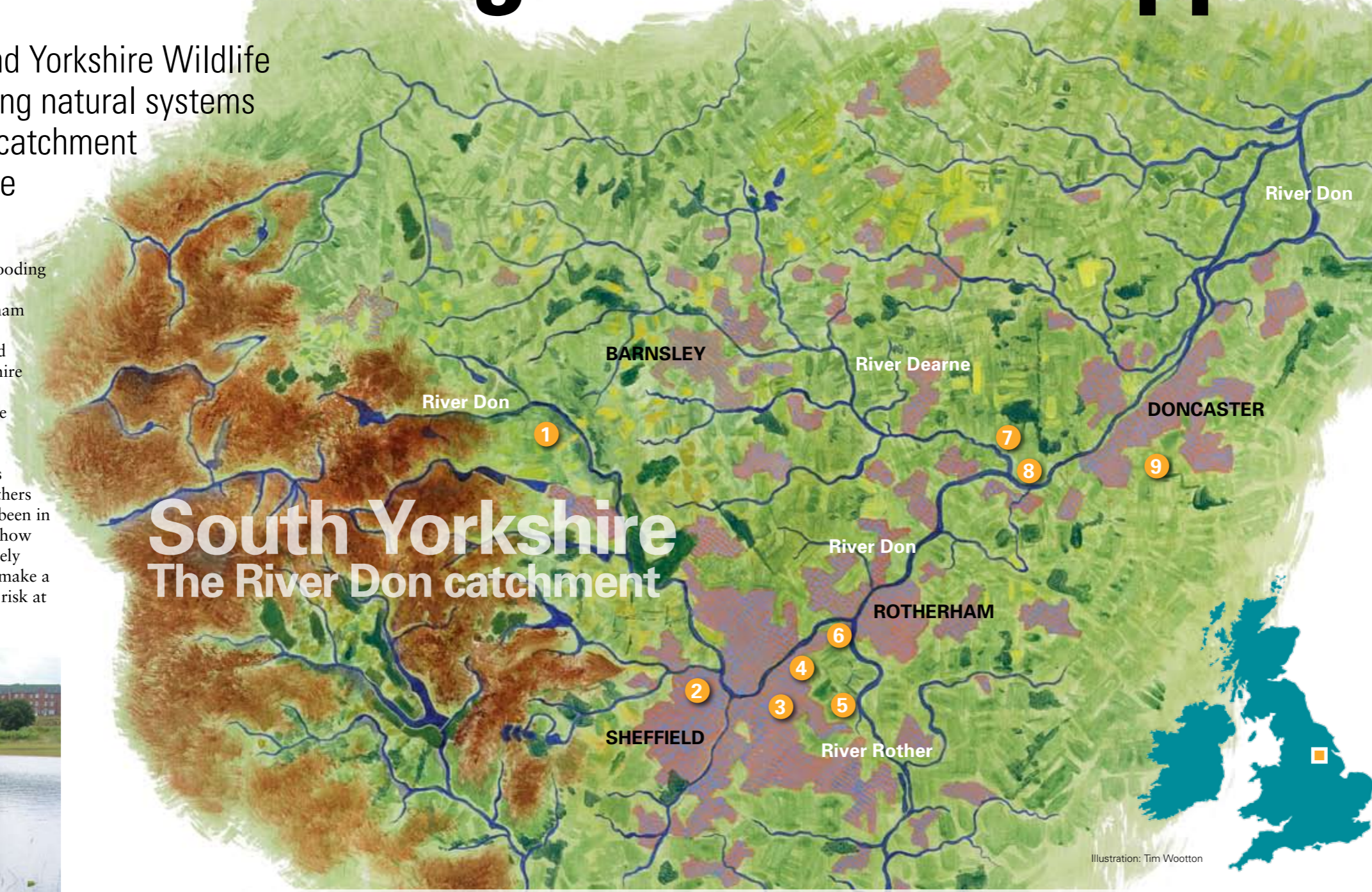


Illustration: Tim Wootton

**1 THE VISION**  
**The Living Don**

Sheffield Wildlife Trust's vision is to create a green network from the high moors of the Peak District to the lower Don Valley, into the heart of Sheffield and Rotherham. New green spaces and recreation opportunities will benefit the 800,000 people who live here. The restored moorland will absorb rainfall, protecting people in the valley from flooding.

**2 GREEN INFRASTRUCTURE**  
**The Green Roof Centre**

In Sheffield, the Green Roof Centre promotes the benefits of incorporating green roofs into new and existing buildings. This includes storage and evaporation of up to 80% of an average summer's rainfall, as well as reducing pollution. The roofs can provide vital habitats for many rare invertebrate species as well as ground nesting birds such as skylarks.

**3 SUSTAINABLE DRAINAGE SYSTEMS**  
**Manor Park housing estate**

In the heart of this Sheffield housing estate, a sustainable drainage system comprising a series of ponds and lagoons helped to protect 300 homes from flooding in 2007. It cost £750,000 less than a traditional drainage system. When not in use as water storage, the infiltration basin provides a valued community space, which is used for hosting local events.

**4 WORKING WITH LOCAL BUSINESSES**  
**Sheffield Forgemasters International**

A six-foot torrent of water swept through the site of this steel engineering company in June 2007. With help from Sheffield Wildlife Trust, it has created a new wetland area on the site. During heavy rain, run-off from a nearby car park will be channelled into a rain garden, reducing flood risk and providing new wildlife habitats and a place for employees to enjoy.

**5 WASHLANDS**  
**Woodhouse Washlands**

This grassland nature reserve is also a controlled washland, where water can be stored safely during flooding. Straddling the River Rother, it features a variety of wildlife habitats including wet pasture, scrub, marsh and open water which support wading bird species such as snipe. It is home to water vole and great crested newt.

**9 NATURE RESERVES**  
**Potteric Carr**

Close to Doncaster, this nature reserve acts as a flood storage area, capable of holding up to 200,000m<sup>2</sup> of water. The recent extension of the reserve was designed with flooding and wildlife in mind, with special islands created for wildlife to take refuge during flooding. It's also home to over 200 species of bird, including the rare bittern and little egret.

**8 NATURE RESERVES**  
**Sprotborough Flash**

This nature reserve is made up of open water, woodland and grassland. The River Don flows alongside the reserve and if the river overflows, water floods these fen habitats which store the water until the river levels have dropped. Around 112 species of bird are recorded annually. The reserve supports breeding populations of reed warbler.

**7 WASHLANDS**  
**Denaby Ings**

This Yorkshire Wildlife Trust nature reserve is a controlled washland adjoining the River Dearne. It has a gate which is used to release floodwater into the fen where it is stored and safely released once the threat of flooding has passed. Reed sweet-grass covers a quarter of the reserve, providing cover for open water birds such as tufted duck and gadwall.

**6 URBAN WETLANDS**  
**Centenary Riverside**

Sheffield Wildlife Trust is helping to create an urban wetland park on land originally earmarked for development. It will provide a floodplain that becomes periodically inundated with water when river levels are high. The centrepiece of Rotherham's flood alleviation project, it will help defend the regeneration zone from flooding and provide a new park for the community.

# What needs to happen now?

Restoring natural systems is crucial to adapting to increased risk of flooding

A significant culture change in the approach to managing flood risk is needed, if we are to cope with flooding better. Flood defence walls will continue to be a vital way of protecting homes and valuable farmland, but if the UK is to address the future effects of climate change, then natural solutions to flood management must play a bigger role.

Living Landscapes can make a difference to how we protect ourselves from flooding and at the same time, restore our damaged landscape. Wetlands need to stay wet for wildlife, but they are invaluable to society for

reasons beyond the wildlife benefits they bring. They store floodwater, provide recreation and tourism opportunities, improve water quality, and can act as the focus for raising awareness of flooding issues in local communities. The Wildlife Trusts will continue to work with others to restore natural systems for wildlife and where possible, do it in a way which will help reduce flood risk. The management of every parcel of land, in rural or urban areas can help to reduce flood risk. We now need the right policies and funding so that land owners and land managers can make it happen.



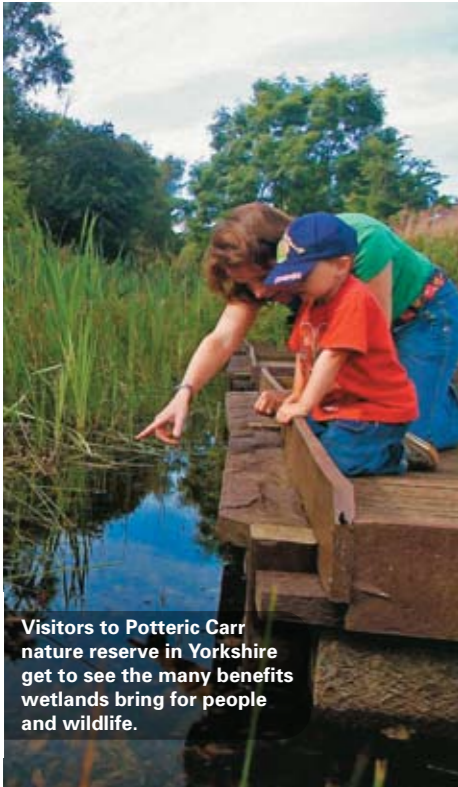
The delicate snake's head fritillary likes getting its feet wet, but not in summer. At BBOWT's Iffley Meadows nature reserve in Oxfordshire, monitoring of populations saw a decline of almost half, from 42,000 in 2007 to only 26,000 in 2008 due to unseasonal flooding in 2007.

© Gavin Hegeman



The riverside burrows of water vole can be totally washed out during floods. Providing 'buffer' habitat to act as a refuge during severe floods will give these charismatic animals a chance of survival.

© Richard Bowsher



Visitors to Potteric Carr nature reserve in Yorkshire get to see the many benefits wetlands bring for people and wildlife.

© Neil Attridge

## The planned Floods and Water Bill

Current legislation in England does not support the use of natural processes to manage floods. The Government has made a commitment to introduce this Bill, which is an opportunity to facilitate a more sustainable approach to flood management.

### What do we propose?

- Amend the legal framework from 'flood defence' to 'sustainable flood management'. This reflects Defra policy to adopt a more holistic approach to managing flood risk.
- A sustainable flood management duty on all operating authorities. This will extend the legislative requirement for sustainable flood management beyond the Environment Agency to Internal Drainage Boards and local authorities.
- Clarify responsibility for sustainable drainage systems (SuDS). This will significantly increase their installation.

## Support restoration of natural systems

Using catchment-wide storage in conjunction with hard defences and appropriate development could save £30 billion by 2080. Funding must be provided for the restoration of natural systems to reduce flood risk.

### What do we propose?

- Subsidise the delivery of flood management services by land managers. Agri-environment schemes across the UK should reward farmers for providing ecosystem services for flood management.
- Set up a river restoration fund in England. Public bodies and other funding organisations should provide vital funds to restore floodplains and wetlands, reducing flood risk and improving wetland habitat. This would help to deliver the requirements of the EU Water Framework Directive.

## Plan, design and monitor flood schemes

Partnership working at the local and regional level to design, implement and monitor flood management schemes is the best way to capture local knowledge and expertise to secure maximum benefits for people and wildlife.

### What do we propose?

- Public authorities should engage the local community, including landowners to develop flood management schemes. Use this to harness knowledge and raise public awareness about the benefits of natural flood solutions.
- Promote the use of SuDS to developers. Local authorities and water companies should encourage and support innovative sustainable drainage schemes.
- Monitor natural flood management schemes. This will improve understanding of the compatibility of wildlife and flooding.

## Around the UK

### Wales

- The Welsh Assembly Government is working with Westminster to ensure that any necessary powers introduced through the Floods and Water Bill are made available in Wales

### Northern Ireland

- In its response to an independent review, the Government published 'Living with Rivers and the Sea' in September 2008. This sets out a flexible policy framework for the delivery of flood risk management over the next 10 years.

### Scotland

- The Flood Risk Management (Scotland) Bill was introduced into Parliament in October. The Bill promotes sustainable, long-term prevention measures to reduce flood risk, including the use of wetlands, operating at the catchment scale as a whole.

- The Scottish Environmental Protection Agency has set up a 'water environment restoration fund' to restore river morphology as part of implementing the Water Framework Directive. Up to £1million will be made available for partnership projects annually.

## Severn Vyrnwy and River Severn Corridor

### SHROPSHIRE WILDLIFE TRUST

This picture shows the floodplain of the Rivers Severn and Vyrnwy, at their confluence near the village of Molverley in north-west Shropshire.

Traditionally this was an area of winter flooding but land practices have changed to support more intensive agriculture. For example, the maintenance of flood banks means that the area has lost much of its wet grassland and traditional late hay meadows to arable and silage.

Changes in the hydrology of the floodplain have had major implications for towns downstream, such as Shrewsbury, Ironbridge and Bridgnorth, all of which were badly affected by floods in 2000.

Shropshire Wildlife Trust's project in the Molverley area aims to help restore the

natural ecosystem of the river, enabling the land to hold back water at peak flood times. The re-creation of wet grassland will benefit a range of birds such as lapwing, whose population of breeding pairs declined from 25 pairs in the 1980s to just six in 2007, reflecting the national declining trend.

Shropshire Wildlife Trust has worked with landowners over the last five years, with the result that over 150 hectares of land in the confluence are now in the Higher Level Stewardship agri-environment scheme. The Trust has also purchased 18 hectares of farmland to demonstrate and explore methods for holding and releasing water sustainably. The Trust is embarking on an evidence-based programme to better underpin future management.

## The Wildlife Trusts

There are 47 local Wildlife Trusts across the whole of the UK, the Isle of Man and Alderney. We are working for an environment rich in wildlife for everyone. With 765,000 members, we are the largest UK voluntary organisation dedicated to conserving the full range of the UK's habitats and species, whether they be in the countryside, in cities or at sea.

Our report, A Living Landscape is available on our website, which explains The Wildlife Trusts' approach to restoring the UK's ecosystems for the benefit of wildlife and people.

**For further information on wetland habitats and to download A Living Landscape, visit [www.wildlifetrusts.org](http://www.wildlifetrusts.org)**

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