

An aerial photograph of a rural landscape. A wide, winding river flows through the center, surrounded by lush green fields and patches of trees. The water is a deep blue, contrasting with the vibrant green of the vegetation. The terrain appears to be a mix of agricultural land and natural habitats. The overall scene suggests a focus on water management and flood risk reduction in a rural setting.

Working with Natural Processes to reduce flood risk

**Lydia Burgess-Gamble –Research Scientist 1
Evidence Flooding & Communities team**

Taking action to reduce flood risk by protecting, restoring and emulating the natural function of catchments, rivers, floodplain and coasts



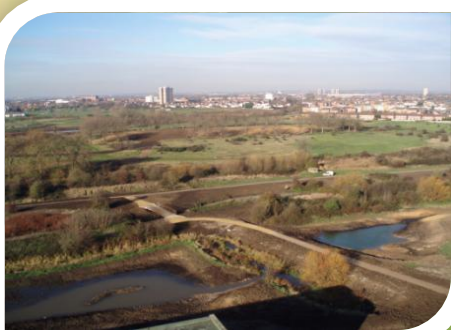
1.

2.



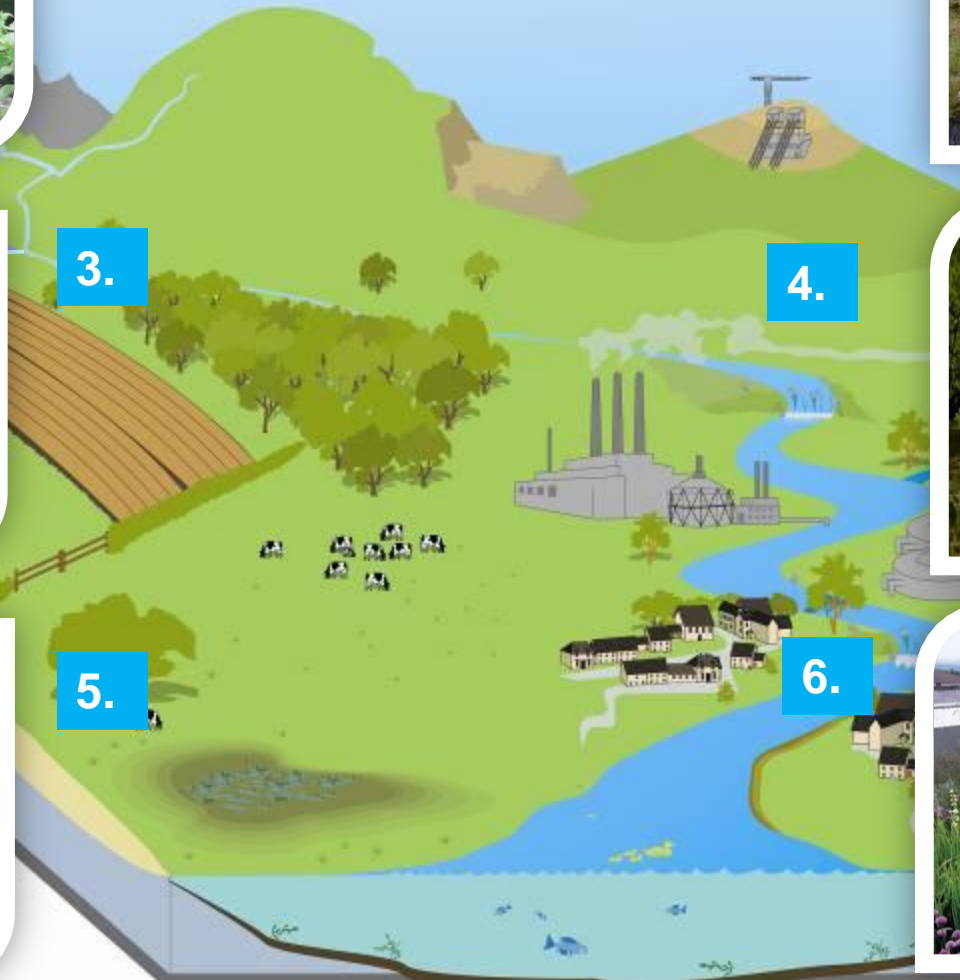
3.

4.

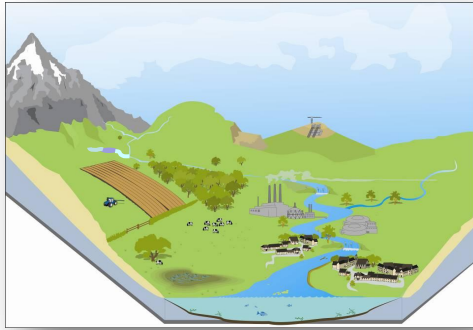


5.

6.



WWNP



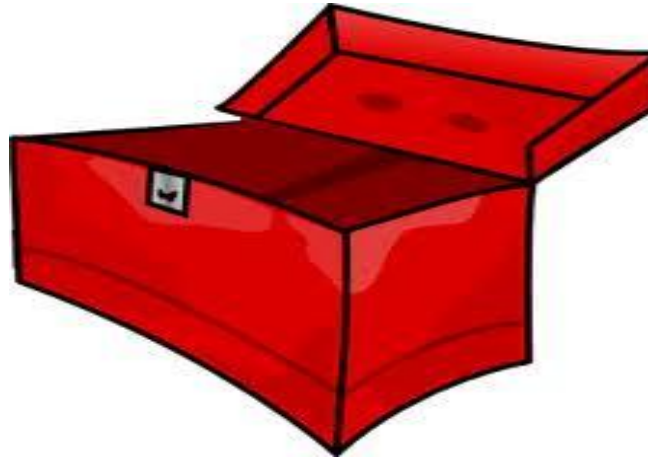
Emergency Response



Modelling, Mapping & Data



Property level protection



Planning



Incident Management



Maintenance



Hard defences



Belford - Northumberland



- Cost £300K
- 10000m³ storage
- 30 runoff attenuation measures

Pickering – Yorkshire



- FSA - 120,000 cubic metres of flood water
- 100 woody dams
- 25% chance of flooding in any year, reduced to a 4% chance or less.

Holnicote Estate – North Devon



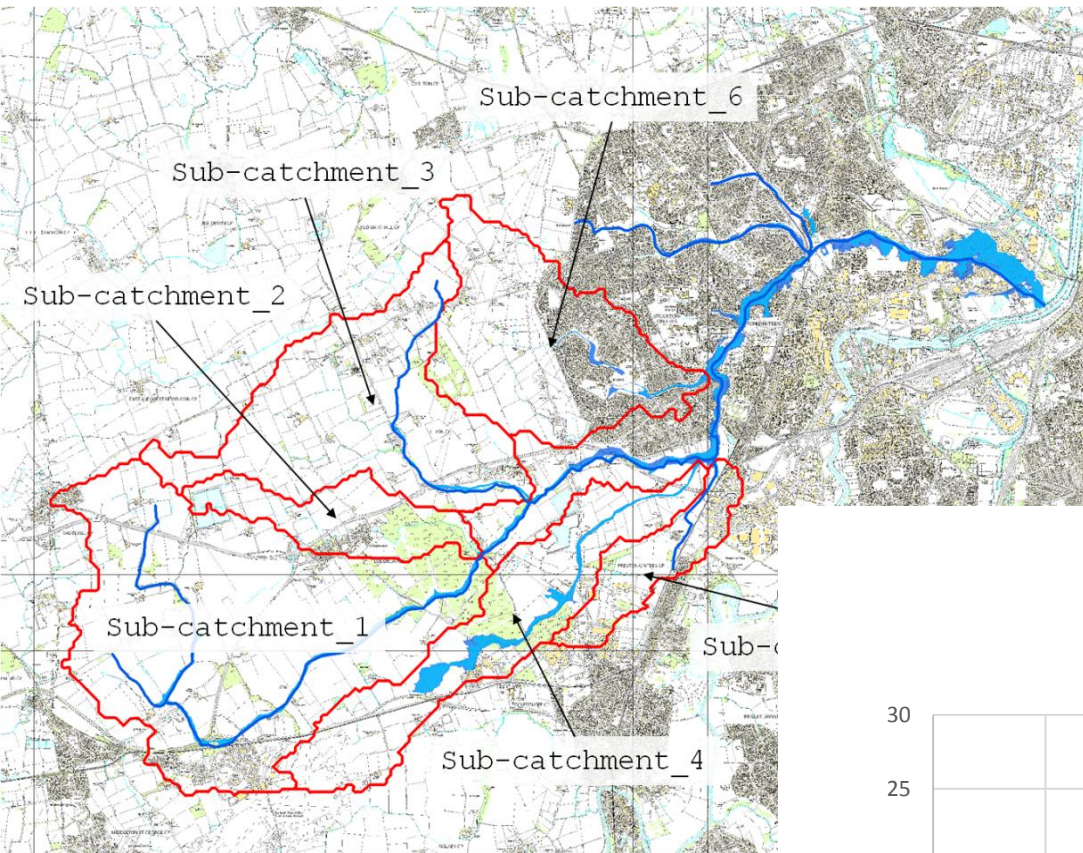
- Cost £135K
- WWNP measures estimated to reduced flood peak by 12%

Evenlode – Honeydale Farm



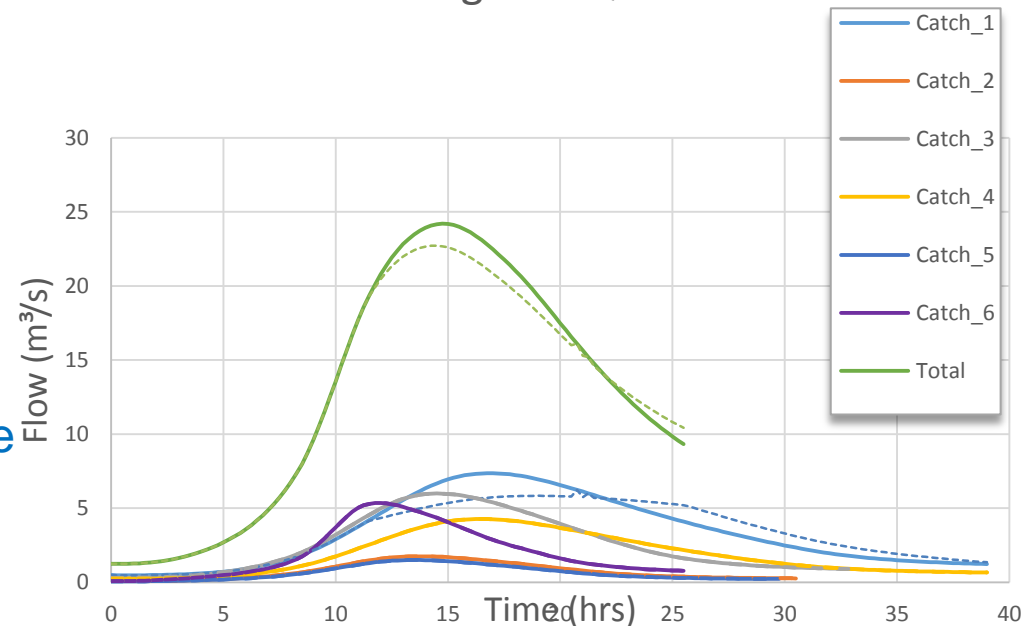
- Partnership project - Cotswold Seeds & Rivers Trust
- Capture the flow upstream to reduce flooding further downstream
- Used small leaky dams known to store and slowly release water

Lustrum Beck – Stockton on Tees



Introduce 40,000m³
storage (40 ponds) storage
into sub-catchment

Mitigated Q



Project cost £3m

£2.2m – Phase 1 – Traditional scheme

£800k – Phase 2 - WWNP

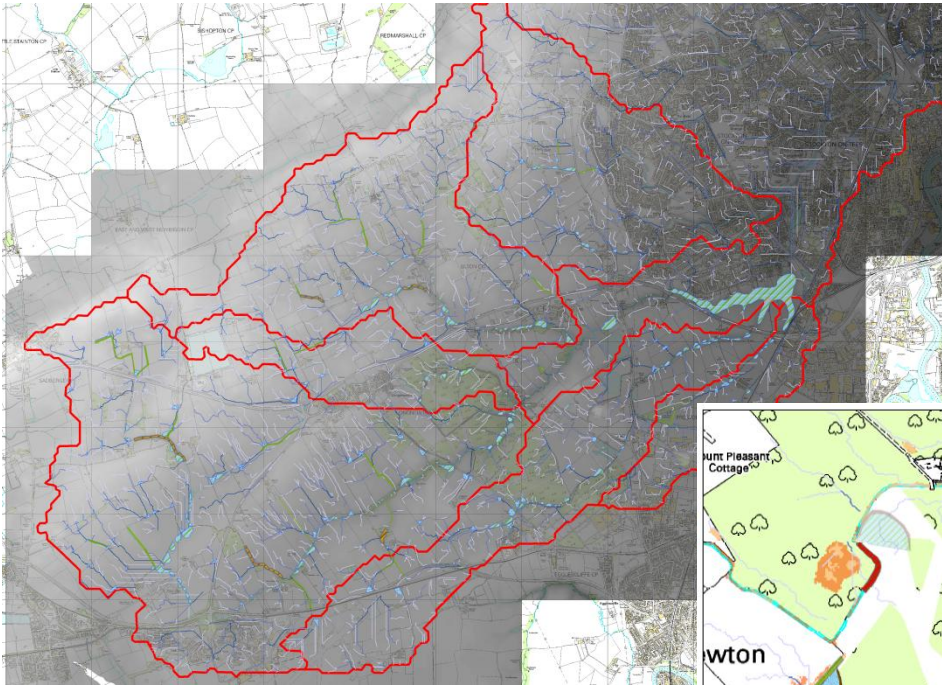
Funding:

£1.8m FDGiA, £800K Local Levy

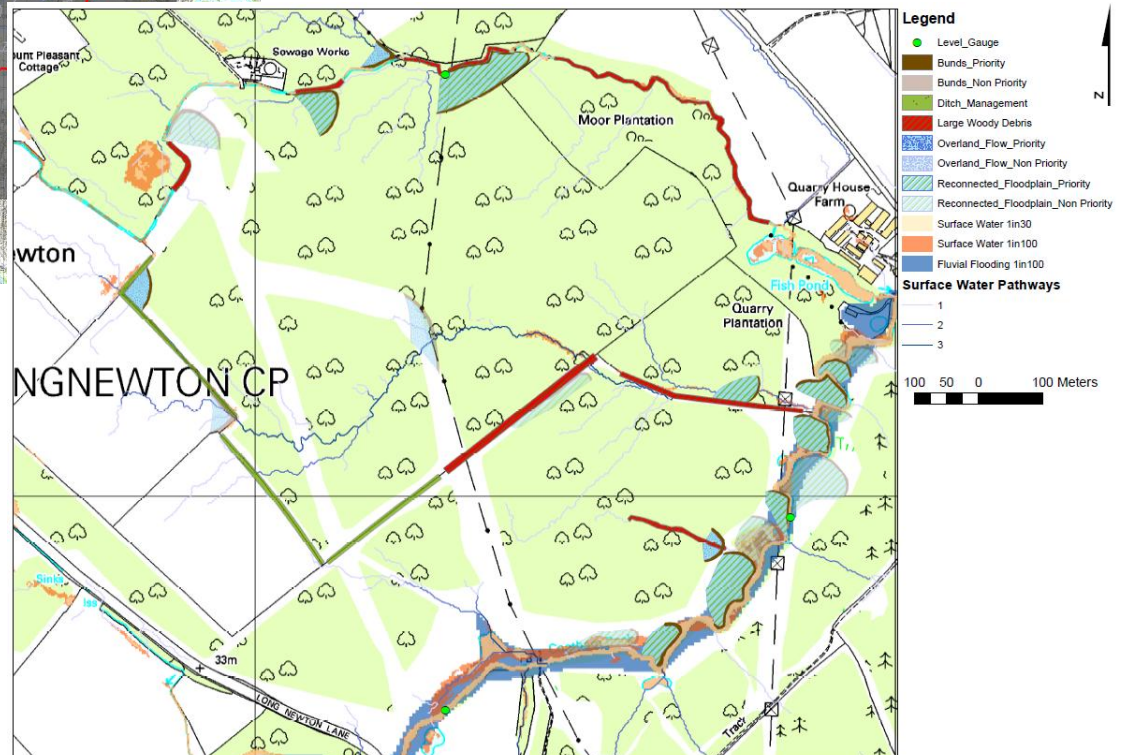
£400k Local Authority Contribution

Lustrum Beck – Stockton on Tees

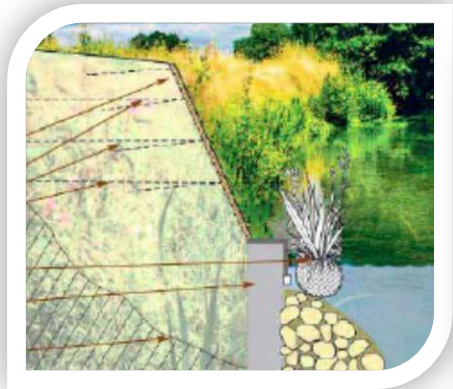
- Identify flow pathways (maps & aerial imagery)
- Identify suitable locations for WWN
- Raise SoP for scheme



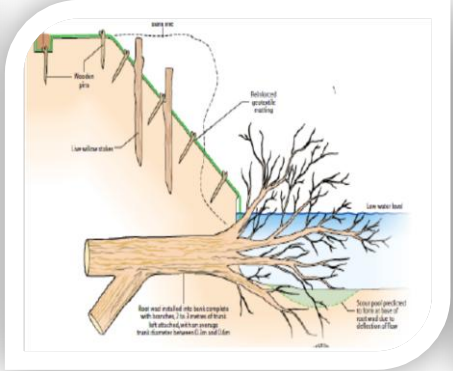
Map locations for
potential WWN



Past & Current R&D



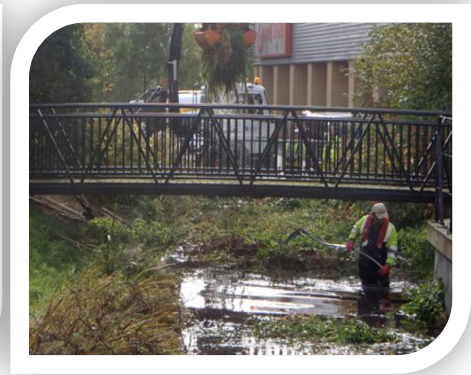
Healthy Catchments



River Restoration



Aquatic Plants



Channel Management

Practical Guidance

Decision Support



Woodlands 4 Water



Catchment Processes

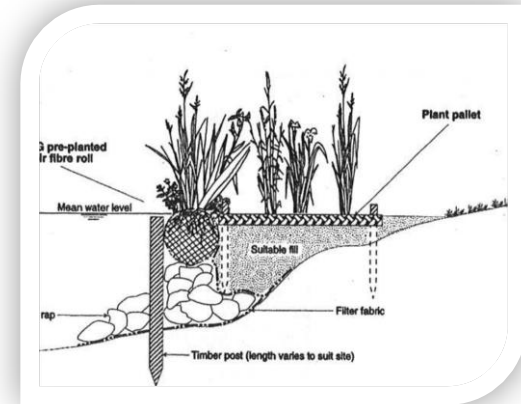


Poole Beach recharge

Maps & Models

Testing new approaches

Next Year's R&D



1. Catchment Laboratories

- Collate existing case studies
- Technical design guide
- GIS-based opportunity maps
- Future opportunities

2. Green Engineering

- Engineering guidance
- Information on whole life costs
- Decision-support tool



Flood and Coastal Erosion Risk Management R&D Research News Winter Issue

Issue 15 February 2009



Research News is the biannual newsletter from the Joint Department for Environment, Food and Rural Affairs (Defra)/Environment Agency Flood and Coastal Erosion Risk Management Research and Development Programme (FCERM). The programme conducts, manages and promotes flood and coastal erosion risk management research and development. The programme is organised by themes which are closely aligned to the operational and policy responsibilities of Defra and the Environment Agency.

If you would like further information on the programme please visit our website at www.defra.gov.uk/environ/fcd/research or email us on fcerm.science@environment-agency.gov.uk

- In this issue:
- 02 Editorial
 - 03 New titles
 - 04 Staff changes
 - 05 Focus on investment decision making
 - 06 Evaluating FCERM policy impacts on climate change
 - 07 Focus on the community
 - 08 What opportunities will arise from next UKCP09 projections?
 - 09 2D hydraulic model review and benchmarking
 - 10 Quantifying uncertainties around rural flood forecasts
 - 11 Retrofitting surface water management – new CRIA guidance
 - 12 Rural Design Guide
 - 13 Urban flood recovery
 - 14 Spatial dependence in flood risk – do we know the real risk?
 - 15 Integrating research for the effective management of our coastal assets
 - 16 FCERM theme updates
 - 18 Strategy and Policy Development (SPD)
 - 19 Modelling and Risk (MAR)
 - 20 Incident Management and Community Engagement (IMC)
 - 21 Sustainable Asset Management (SAM)
 - 22 Reservoir safety research update
 - 24 Contacts

Model review and

Flood and Coastal Risk Management (Management) are working together on a mark 2D hydraulic modelling software



Figure 1: Model output for flood risk in Lancashire

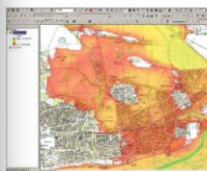


Figure 2: Model output for flood risk in Lancashire

Research News: Winter Issue Flood and Coastal Erosion Risk Management R&D 9

Joint Defra / Environment Agency Flood and Coastal Erosion Risk Management R&D Programme

Field trial of a demountable flood defence system between urban structures

Product Code: SCHO1008BOTV



science summary

www.environment-agency.gov.uk

SCHO1008BOTV-E-P

SC040065/SR Field trial of a demountable flood defence system between urban structures Science Summary SC040065/SS

A demountable flood defence system is a flood barrier that is either fully pre-installed and requires some form of operation during a flood event, or one that is partly installed and requires further installation in advance of a flood.

This report describes a pilot project in which a demountable flood defence system was operational in the city of York, in spring 2005, to protect 14 houses from the flooding of the River Ouse. It was a joint collaboration between the Environment Agency, Aquabarr Ltd., a manufacturer of flood defence products and City of York Council.

The case study project shows what issues may be faced during the planning and installation of demountable flood defences in urban areas. The results should be of interest to asset managers, flood risk managers and companies commercially developing flood risk management products.

Demountable flood defences can be an important part of a flood risk management system, in places where permanent barriers are too expensive or impractical. They can also be used temporarily, while more permanent defences are being constructed.

At Clarendon, in York, a demountable flood defence scheme was chosen, consisting of L-shaped plastic units linked together to form a continuous wall across a street. The defence required a permanent concrete ramp to be constructed across the street. This had the dual purpose of taking the protection up to the required height and also to provide a rigid surface for the units to be bolted against. The units are attached to existing infrastructure either side of the street by means of bespoke metal fixings. There has been little previous assessment of systems such as this that provide a barrier to flood water between buildings.

We single out four stages in the process of implementing demountable flood defences:

- justification
- design
- approval
- construction, installation and whole life management.

The justification stage includes feasibility, which assesses the costs and benefits of different flood defence options. To justify a demountable flood defence system, the benefits should exceed the costs. The need for environmental impact assessment and an appropriate flood warning system must also be considered at this stage.

The design stage involves consulting those groups with an interest, or a statutory involvement in the project including local authorities, communities and democratic representatives. The consultants should be given an opportunity to comment on the proposals. In the design of demountables, it is important to consider where the defences meet the existing infrastructure, as these points are potential weak spots where seepage could occur. The design must provide a reliable, watertight defence. The costs of ongoing maintenance, decommissioning and replacement must be included.

Obtaining landowner approvals can be a lengthy process and time delays should be allowed for in the project planning. Consultations with the adjoining property owners alone took two years, partly due to their anxieties about the failure and impact of the system. Good quality communication with those affected is essential throughout the project.

Finally, in planning the construction stage of the project, while the considerations such as inspection, monitoring and maintenance are vital for ensuring optimum performance. Monitoring how well the defences work in a real flood situation is particularly important.

A good operational plan must be in place, describing when the demountable defences will be deployed, who will collect them, and from where, and how they will be

lydia.burgess-gamble@environment-agency.gov.uk

<http://evidence.environment-agency.gov.uk/FCERM/en/Default/FCRM.aspx>