

## Slowing the Flow at Pickering

### Location

**Country:** UK

**Scale:** local

**Region:** North Yorkshire, England – across the catchments of Pickering Beck and the River Seven

### Compensated /improved ecosystem services

- Regulation of water flow
- improved water quality
- provision of new and/or improvement of existing habitats
- enhanced carbon sequestration
- improved recreation/tourism access

### Management

The Slowing the Flow at Pickering project was one of the three pilot projects funded by under DEFRA's multi-objective flood management demonstration programme. It implements multiple natural flood risk measures including low level bunds, large woody debris dams, planting riparian and floodplain woodland, planting farm woodland, blocking moorland drains and establishing no-burn buffer zones, blocking forest drains and implementing farm-scale measures. The project involved both the Pickering Beck and adjacent River Seven catchments. The town of Pickering in North Yorkshire has a history of flood events, most recently in 1999, 2000, 2002 and 2007; the last of these causing an estimated £7m (€8.05m) of damage.

The aim of the project is to show how land management measures can help to reduce flood risk from a river in the town and is implemented in close cooperation with local stakeholders. A catchment level land management approach was devised to deliver improved flood protection through "working with nature" processes. A crucial element of the approach was to better understand how floods are generated in a catchment and how land use and management affects the speed and volume of flood flows (four principal land use types were identified in the Pickering catchment – forest, arable, heather moorland and improved grassland).

Slowing the Flow at Pickering is based on an 'inputs-based approach' with finance provided by a range of government agencies.

### Stakeholders

**Sellers or service providers:**

Major Land Owners – FC(E), NYMNPA, Duchy of Lancaster Estates & North York moors Railway

**Buyers and beneficiaries of services:**

A large part of the local funding come from national funding allocations (e.g. block grants) to local authorities

**Knowledge providers:**

Forest Research & Durham University

**Donors – funding and regulatory agencies:**

DEFRA, FC(E), EA, NE, the Regional Flood & Coastal Committee and Ryedale DC

### Intermediaries:

Local Authorities: NYMNP, NYCC, Ryedale DC, Pickering Town Council y Sinnington Parish Council

Community Representatives: Ryedale Flood Research Group, Pickering Civic Society & Flood Defence Group

Local engagement: Partners on Programme Delivery Group and/or Programme Board, wider contact via community engagement days, local meetings and hosting site visits

### Design authority:

Authority type	Role	Responsibility	Comments
Other	Financing	North York Moors National Park Authority	Land management/ownership, planning authority within National Park. Financing of project €58046
Other	Financing	Ryedale District Council	Local planning authority and project financing €1094368
Regional/sub-national water authority	Financing	Regional Flood Defence Committee	Provides funding from local levy €179310
National water authority	Determination of design details of the measure	Environment Agency	Expertise on design of measures. National agency responsible for flood management and WDF implementation. Financing of project €93103
Other	Implementation	Forestry Commission	Forest policy and land management/ownership. Financing of project €127675
Other	Financing	Natural England	National agency responsible for natural heritage and agri-environment measures cover woodland creation. Financing of project €25287
		Duchy of Lancaster Estates	

### Timeline

**Establishment year:** 2011

**Time horizon:** short term

**Status of PES:** active scheme

### Availability of economic data

#### Benefits Delivered - Outcomes and benefits of the Slowing the Flow project include:

- Risk of flooding in the town of Pickering reduced from a 25% chance in any year to less than 4%
- A strong and enthused local partnership in place to take the project forward, by maintaining the implemented measures and seeking opportunities to extend them to further reduce the risk of flooding in Pickering and Sinnington
- An engaged local community, who have embraced the concept of working with natural processes and have faith that this approach makes a positive difference to flood risk management – the scheme having performed successfully already during high rainfall events in 2012 and 2015
- A much more joined up and inclusive approach to flood, water and land use management, driven by stronger local and regional delivery partnerships
- Greater national awareness and consideration of the benefits of working with natural processes, e.g. through strong brand recognition of "Slowing the Flow"
- Positive influence on Government policy and support for woodland creation
- Raised awareness of the multiple benefits/services provided by working with natural processes and informed better economic evaluation of EC

## **Socio-economic:**

### **Ancillary benefits:**

An ecosystem services assessment estimated impacts of 85 ha of woodland creation (F1: riparian, floodplain and farm woodland) and 150 large woody debris dams (F10) but not the storage bunds (N1). This is a higher area of woodland than actually planted. Mean annual (€/yr) Habitat creation: 139,683; Flood regulation: 6,855; Climate regulation: 123,029; Erosion regulation: 236; Education and knowledge: 16; Community development 631

### **Costs investments:**

€1.32 m N1: low level bunds €17,951; F1: riparian woodland (€2070/ha for native broadleaved, plus €2300/ha for flood risk management) €27,782; F10: large woody debris dams (labour costs)

### **Costs land acquisition:**

Land ownership does not change

### **Costs maintenance:**

F10 (large woody debris dams) are expected to need ongoing maintenance, the costs are not specified

**Costs total:** 1580000

### **Compensations annual information:**

No specific compensation is discussed in the project documentation, but it is noted that given potential losses of agricultural output, compensatory payments may be necessary to ensure sufficient uptake of some measures.

### **Information on Economic costs –income loss:**

An ecosystem services assessment estimated impacts of 85ha of woodland creation (F1: riparian, floodplain and farm woodland) and 150 large woody debris dams (F10) but not the storage bunds (N1). This is a higher area of woodland than actually planted. The estimated loss of agricultural production was €36326 per year or €10470000 over 100 years.

### **Information on Economics costs-other annual:**

The ecosystem services assessment estimated increased forestry costs of €620000 over 100 years

### **Ecosystem improved biodiversity:**

Creation new habitat

### **Ecosystem provisioning services:**

Loss of agricultural land for riparian and floodplain woodland

### **Ecosystem impact climate regulation:**

Increase in woody biomass and soil C storage

### **Ecosystem flood control return periods:**

N1 floodplain storage has sufficient capacity for a 1 in 25 year flood event

### **Ecosystem erosion control:**

Riparian and floodplain woodland should reduce soil erosion

## **References / Source of information**

<http://nwrn.eu/case-study/slowing-flow-pickering-uk>

[http://nwrn.eu/sites/default/files/case\\_studies\\_research/cs-uk-03-final\\_version.pdf](http://nwrn.eu/sites/default/files/case_studies_research/cs-uk-03-final_version.pdf)

<https://www.forestresearch.gov.uk/research/slowing-the-flow-at-pickering/slowing-the-flow-at-pickering-about-the-project/>