

Case Study

SMART- Improving the ecological status of the River Rother

Background

The River Rother should potentially have high biodiversity value by providing habitats for 'priority species' such as the sea trout, otter and water vole. However, under the EU Water Framework Directive* the current ecological status of the river is 'poor,' in part as a consequence of soil erosion and river sedimentation.

Erosion is the process by which weathered parent rock, soil and previously deposited sediments are removed from the land surface by wind or water flow and then transported and deposited in other locations such as on the bed of the Rother shown in Figure 1.

Sediment in the river could come from several sources including channel bank erosion, cultivated fields, felled forests, damaged road verges and the collapse of earth banks in sunken lanes. Fine sediment in rivers often contains pollutants which can have negative consequences on the health of both plant and animal life in the river.

The project is tasked with finding out which source is the most likely and establish how it is connected to the river. The team will use forensic science techniques to help find where the sediment has come from, sediment from different places will often have different chemical signatures. These pollutants will be evaluated as part of the study.

*http://ec.europa.eu/environment/water/water-framework/info/intro_en.htm



Fig. 1 Fine sediment deposited on the bed of the River Rother

The project

The SMART (Sediment and Mitigation Action on the River Rother) project is a partnership project delivered by the South Downs National Park Authority (SDNPA), University of Northampton (UoN), University of Oxford and the Arun and Rother Rivers Trust and represents a PhD programme of work. The PhD bursary of £60,000 is funded 50-50 by the SDNPA and the UoN.

The project aims to establish:

- Where the sedimentation issues are of most concern
- The source of sediment within the river catchment area
- What can be done to rectify the problem

This will involve the project team in: (i) detailed mapping of erosion and landscape connectivity, (ii) taking sediment cores from ponds and floodplains in order to establish the extent to which erosion has changed over the last 100 years and (iii) evaluate a range of sediment mitigation options that might be employed to control sediment delivery to the river.

With this evidence the Arun & Western Streams Catchment Partnership will be able to develop bespoke, targeted projects with specific actions designed to improve the ecological status of the river.

The project will also produce education materials aimed at disseminating the research findings to the widest possible audience.

“Sedimentation is one of the key pressures causing the River Rother to fail environmental standards. It is therefore vital that we understand where it is coming from and what mitigation measures can be put in place to deliver improvements. The SMART project will provide this crucial evidence.

Sir Sebastian Anstruther, Chair of the Arun & Rother Rivers Trust, Chair of Arun & Western Streams Catchment Partnership

Fieldwork

The fieldwork programme is currently underway. There are three phases to the work being undertaken by the team (Figure 2).

Phase 1 – a reconnaissance survey undertaken across the whole Rother catchment to identify sub-catchments where sediment pressures are most extreme.

Phase 2 – more detailed research within the sub-catchments to quantify sediment sources and pressures by identifying and mapping areas of extreme erosion and sediment pathways to the main river and by the use of sediment fingerprinting – this involves taking routine sediment samples from the river and from possible source areas.

Phase 3 – an analysis of sedimentary records contained in small ponds and reservoirs within the sub-catchments in order to establish the extent to which rates of erosion have changed since the beginning of the 20th century. This involves extracting and sampling sediment cores.



The future

The SMART project will complete in 2017–18.

The outputs will be used by the Arun & Western Streams Catchment Partnership to support the development of ‘on the ground’ mitigation actions through close working with farmers and landowners.

The implementation of such measures will deliver ‘win-wins’ – an improved river environment and more sustainable agricultural land.

This contributes directly to the ‘Purpose 1’ of the National Park – to conserve and enhance the natural beauty, wildlife and cultural heritage; and to the ‘Duty’ of National Parks – to seek to foster the economic and social well-being of local communities.

For more information please contact:

Jennine.Evans@northampton.ac.uk

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