River Restoration NEWS

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Newsletter of the RIVER RESTORATION CENTRE

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River Rye Habitat Improvements

Ryedale Anglers' Club is an old and respected club established in 1846. It leases approximately 19km of water and employs a full-time River Keeper. Waters are not stocked, relying on self-sustaining brown trout and grayling to provide sport for members. Lyn Mansfield (North York Moors National Park Authority) reports on one of the Club's projects to improve brown trout habitat supported by the CAN DO partnership.

This project involved setting up a sustainable programme of tree thinning along a stretch of the River Rye to improve the habitat for brown trout and other species such as grayling. There were a number of environmental, landscape and other issues that needed to be addressed before work could start and the fact that it was carried out sympathetically with no adverse environmental footprint is a strong testament to the commitment of all concerned.

In total, around 1.8km of river bank has been thinned to date and initial monitoring evidence suggests that there has already been an increase in river flies and that fishing has improved along the upper river. Since the award, work has started on the next stretch and is planned to continue into 2009.

Support provided to the Anglers' Club by the CAN DO (Hambleton and Howardian Hills Cultural and Natural Development Opportunity) partnership and the landowners (Duncombe Park Estate), has given its members experience and skills in many different aspects of environmental management and contract supervision, and has enabled them to reinvest in the project by selling the timber to local merchants. The Club has also provided training for several members in monitoring river flies to track the project's benefits. It took part in the Riverfly monitoring pilot scheme that has now been launched nationally and now members collate results of their own and other local groups' surveys and forward them to the Environment Agency and Natural History Museum.

This project was highly commended in the Wild Trout Trust & Orvis Conservation Awards 2007. The project was carried out by Ryedale Anglers' Club with support from the CAN DO Partnership - a group of organisations working together to enhance a defined area of landscape in North Yorkshire. The judges were particularly impressed with the partnership element and the care taken to minimise environmental impact while carrying out the work.

Photo 1:WTT Awards Professional Category runners-up - Ryedale Anglers & the CAN DO partnership

Simon Dench, Club Secretary at Ryedale Anglers Club, said: "This whole project would not have been possible without the expert advice and help from the CAN DO partners, in particular the Environment Agency, North York Moors National Park Authority, Natural England, the Forestry Commission, and the co-operation of the Duncombe Park

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Estate, for which the Ryedale Anglers are extremely grateful. The award reflects the hard work and co-operation of the project, and monies received will be put back into the project to allow further work to be carried out."

Partners include:

North York Moors National Park Authority, Hambleton and Howardian Hills Area of Outstanding Natural Beauty, Natural England, English Heritage, Forestry Commission, Environment Agency, Hambleton District Council, Ryedale District Council and Framework for Change.

For more information about this and other projects visit: www.moors.uk.net, www.wildtrout.org

Photo 2: Habitat improvement on the River Rye

Changing Faces of the RRC Board of Directors and Advisory Board

The RRC's Board of Directors and Advisory Board are responsible for guiding the work and direction of the Centre. Our Board of Directors comprises both public and private sector individuals with expertise in operational aspects of river restoration. It is supported by the Advisory Board with representatives from key government agencies in the UK.

Board of Directors

During 2007 we invited two individuals to join the RRC Board of Directors namely, Dr Andrew Gill and Dr Mervyn Bramley. Andrew has a background in Aquatic Ecology, currently lectures at Cranfield University and is convenor of the Environmental Water Management MSc course. Mervyn is a chartered engineer with experience in design, policy development and R&D relating to the sustainable management of rivers. He is now an independent engineer and environmentalist.

Advisory Board

Changes have also occurred within our Advisory Board. George Roddy is our Rivers Agency representative, for the Environment Agency Wendy Brooks is our Flood Risk Management representative, and Judy England will be our key contact for Fisheries, Recreation and Conservation. The Environment and Heritage Service, through John Early, have joined as a new core funder.

We would like to take this opportunity to welcome all our new members to the board and say thank you for the help provided by those that stood down during the last year.

For further details of all our Directors and Advisory Board Members please refer to the RRC website.

Gravel-Bed Rivers V1 – From Process Understanding to River Restoration

Habersack, H, Piegay, H and Rinaldi, M (2007) Elsevier Science (*836pp £100* – ISBN 978-0-444-52861-2)

Based on the outputs of a workshop in 2005 held in Austria, this text focuses on the abiotic and biotic degradation in rivers as a result of past engineering measures for agricultural land gain, settlement, gravel exploitation and mining, and hydropower. The world-wide array of authors have together been able to provide an authoritative text on how to analyse river sediment delivery and storage processes from the local to basin scale and covers issues such as how climate change might impact on sediment loads in rivers and the implications of this for management.

River instability is addressed in terms of the interaction with vegetation and ecological responses to human pressures. This leads to discussion about how to link hydro-geomorphic processes with ecological demands and the need to provide scientific knowledge for river managers.

The book considers applied aspects of river restoration and management and outlines tools for assessing how greater habitat heterogeneity might be achieved by analysing a series of channelized, rehabilitated and reference conditions in terms of a restoration site potential and then relating the findings to aquatic habitat types.

River basin management is highlighted as being a crucial factor in achieving WFD 'good ecological status', but stresses that this is a complex task that requires a detailed understanding of the interactions of large and small scale river processes and patterns.

This book concentrates on gravel-bed rivers, but nonetheless many of the concepts discussed should be of interest to a wide audience and help instigate discussion about the challenges and the constraints of river restoration.

Channel RestOration in Contaminated Urban Settings (CROCUS)

Geraldene Wharton provides a short update on a recent seminar series focusing on some of the challenges of urban river restoration.

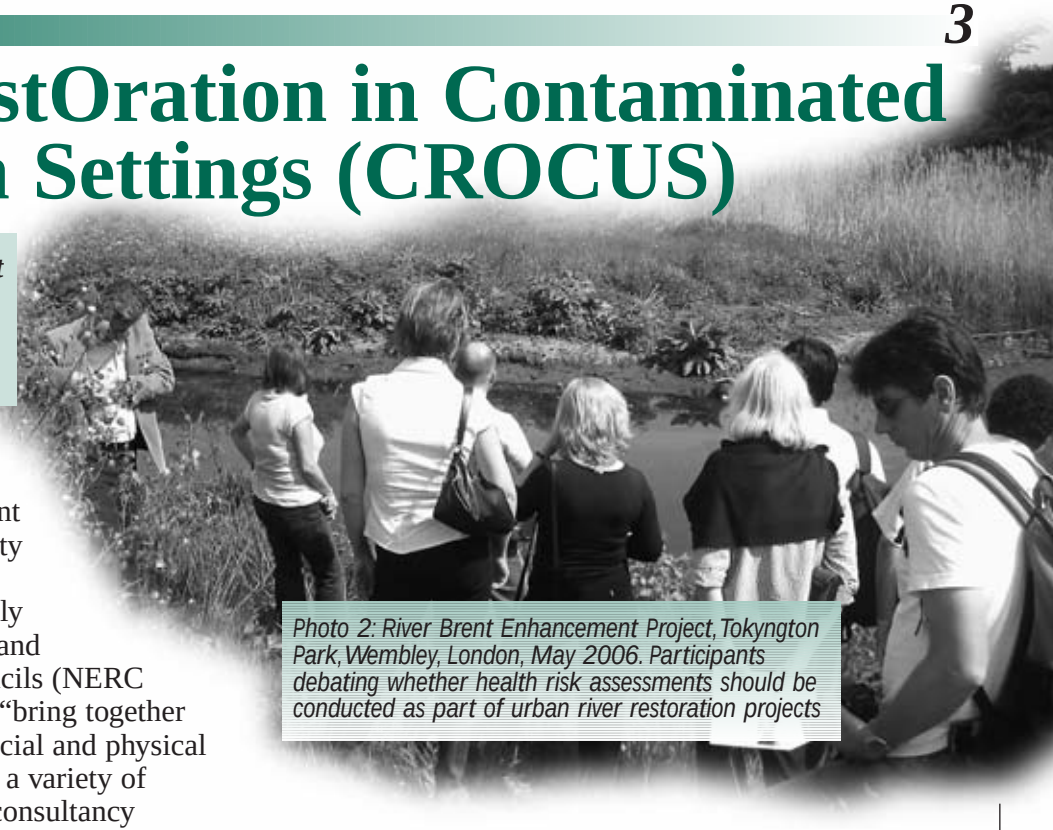

Photo 2: River Brent Enhancement Project, Tokyngton Park, Wembley, London, May 2006. Participants debating whether health risk assessments should be conducted as part of urban river restoration projects

The first phase of CROCUS came to an end on November 8th 2007 with a final seminar held at the Department of Geography, Queen Mary, University of London. This trans-disciplinary seminar series (2005-2007) was jointly funded by the Natural Environment, and Economic and Social Research Councils (NERC and ESRC) and its key aims were to "bring together leading researchers, from both the social and physical sciences, with key practitioners from a variety of government, non-governmental and consultancy backgrounds to address the potential conflicts in urban river restoration and identify ways in which river restoration can deliver multiple benefits to urban areas" (RRC Newsletter, Issue 25, 2006).

In an increasingly urban world, restoration of river corridors in our towns and cities can provide much-needed green space with ecological, as well as therapeutic benefits. Such schemes also assist flood management by storing water and attenuating flood flows. However, these sites may have a legacy of contaminated sediments, for example from past industrial activity, and there is the potential for the newly-restored floodplains to act as significant storage zones for sediments that are being carried through these catchments (*Photo 1*). Are these sediments posing a risk to public health and compromising the overall success of urban river restoration projects? How can schemes be designed to cope with increasing urban runoff of water and sediments? Should urban river restoration projects therefore be required to carry out health risk as well and environmental assessments? These were some of the questions addressed in the six CROCUS seminars.

Photo 1: Restored urban floodplains act as sediment storage zones and sites where sediments can be re-mobilised (River Brent, December 2007)

The seminar themes included: restored rivers as culture; restored rivers as contested nature and engineered components of urban lifestyles; river restoration and public health issues; policy, governance and management of restored rivers as risk-prone environments; and communicating and managing risk in urban settings – towards solutions. The seminars included presentations, workshops and site visits, including a field trip to the recently-restored section of the River Brent at Tokyngton Park, north-west London (*Photo 2*), and were attended by a variety of researchers, practitioners and policy makers from across the UK. An international perspective was provided in the presentations given by Victor Magar, ENVIRON, Chicago; Shannah Anderson, University of California at Berkeley; Susanne Heise, Technische Universitaet Hamburg; and we were joined by researchers from the Bulgarian Academy of Sciences for our second seminar.

At the final seminar there was a lengthy discussion about how we should take our ideas forward in a second phase of CROCUS. A selection of papers from participants in the seminar series covering the key themes will be published in a special issue of the journal 'Environmental Hazards'. We are particularly keen to build upon the inter-disciplinary and international network established over the past two years through future collaborative work. If you are interested in participating in these discussions on future projects it would be great to hear from you.

Further details about CROCUS, including contact details of the organising committee, seminar papers and discussion notes, can be found on the River Restoration Centre's website (www.theRRC.co.uk), or contact Geraldene Wharton, Queen Mary, University of London (g.wharton@qmul.ac.uk).

Turquoise is t

Following her prize winning Master's dissertation and experience in planning practice concerning floodplain restoration projects for flood risk management, Karen Potter has embarked on a PhD at Liverpool University. Her research will focus on the role of the new Spatial Planning System in helping bring about a 'radical rethink' on land use to adapt to climate change and rising flood risk.

Following the dramatic flood events of the 1990's and turn of the century, local authority planners and the Environment Agency came under widespread criticism. The flooding was said to have highlighted the cumulative impact of land drainage, urbanisation and river regulation over previous decades, significantly reducing natural water storage capacity of catchments (Blackwell and Maltby, 2005). The Wildlife Trust's Water Policy Manager, Allison Crofts (2000) commented: "the long-term solution to flood devastation is to restore our floodplains and wetlands. These habitats provide vital functions in rain retention, water storage and flood alleviation as well as supporting a wealth of wildlife. It is essential that we work with nature and not against it. The use of hard engineering for flood protection is not the only solution, and in some cases can make things worse".

Following the wake up call of the Foresight Future Flooding Report (2004), stating the risk of flooding will increase greatly over the next 30 to 100 years, the Government's strategy 'Making Space for Water' does look to take a more holistic approach to flooding. What's more, in recent months there has been an emphasis on more sustainable land use following the Stern Report on the Economics of Climate Change. For example, in March 2007 David Miliband (then Environment Secretary) praised the Japanese who leave corridors of green space alongside the banks of urban rivers. "Rather than building expensive concrete barriers to insulate ourselves from flood risks, we could create what could be called 'turquoise belts'. If and when the water spills over into the green space, it would not matter" (Miliband, 2007).

Converting Rhetoric into Reality

Although the political rhetoric is growing on restoring rivers' natural floodplains, converting the "rhetoric into reality" at the large spatial scales required represents a serious challenge (Werrity, 2006).

Interviewees for Karen Potter's Master's dissertation highlighted the many challenges faced. "In theory floodplain restoration is good, but if it is not meeting the technical, environmental and economical appraisal, then it hits the buffers". The big change in mindset was also acknowledged; "Farmers were paid to plough and drain….Grandad spent so much money to drain, then we say we want it nice and soggy with tweeters on it – it's very difficult" (Anon, from Potter, 2006).

The Pitt Review Interim Report on the causes and consequences of this summer's floods notes that a greater use of washlands and wetlands, realignment of river channels and reconnection of rivers with their floodplain can all help store and slow water to reduce flooding downstream and mitigate peak flows, although many of the responses to the Pitt Review felt that this approach was not being translated into results on the ground, suggesting more effort was needed to encourage implementation, including finding and obtaining the use of the land needed to make them a reality (Cabinet Office, 2007).

The Spatial Planning Challenge

Current planning policy guidance (PPS 25) acts as a key tool in managing future flood risk by influencing where new development takes place, yet the planning system could play a much more radical role regarding future land use across entire catchment areas. For example, flood risk management is clearly acknowledged as one of the benefits of 'Green Infrastructure' and opportunities could be taken in regeneration schemes to deculvert and restore rivers' natural floodplains.

In July, the Prime Minister outlined a planned programme to create three million new homes by 2020, which underlines the challenge the planning system faces in squaring

River Bank erosion – The need for a

Duncan Wishart and Kevin Skinner (Jacobs) discuss the often conflicting views on management of river bank erosion and in doing so seek to provide a means for a balanced approach to its solution.

Photo 1: River Caldew, Cumbria - A high flow event led to significant bank erosion triggering a phase of adjustment allowing the river to adapt to changing flood frequency and magnitude

Bank erosion is a major issue in river management in the UK and has a significant impact on the resources of river management agencies and stakeholders. Yet, how we perceive bank erosion and choose to manage it is critical in determining its impact on resources.

Is bank erosion a problem?

The British Trust for Conservation Volunteers (BTCV) advise that before creating a bank erosion solution, consideration should be given to whether this is the most appropriate action (Agate and Brooks, 2003). However, field geomorphologists often come across situations where stakeholders, faced with river bank erosion, have assumed that it is a process that should be stopped immediately. The desire to 'fix' the erosion 'problem' often results in the installation of some form of bank protection, typically a revetment. Frequently, the type of revetment is determined by factors such as cost, the availability of raw materials, or preconceived notions of what works best or is environmentally sound. In these situations, protection solutions are often developed and implemented relatively unquestioningly or simply by assuming it is the best course of action. However, by asking some key questions and challenging preconceived notions it is possible to save time and money. We should take time to think first and act later.

Bank erosion can undoubtedly have real negative impacts and these include:

- Land loss
- Property and infrastructure damage
- Release of fine sediment (which may also be contaminated).

In some circumstances these issues might not be that significant but there is a perception that erosion is a sign of poor river health. Bank erosion is often perceived to be a problem, no matter what the cause, for the environment in which it occurs.

Bank erosion can have positive impacts:

- It can provide an important source of bed sediment in rivers and is often the primary source of certain sediment sizes in catchments where supply from other sources is limited. This input is important for spawning in fish species such as salmon (gravels) and lamprey (fine sediment)
- Bank erosion is a natural process which occurs when rivers adjust their form in response to changes in hydrology and sediment supply (*see Photo 1*)
- It provides the means by which rivers migrate laterally and rework floodplains which ensures habitat diversity, in the form of a range of channel environments (such as bars and islands), is maintained (*see Photo 2*)
- Eroding banks provide habitat for birds and small mammals (*see Photo 3*)
- Actively eroding banks may also add to the aesthetics of a landscape.

Photo 2: River Wear, County Durham - Reworking of the floodplain has created a diversity of habitats and good river-floodplain connectivity

Taking action

Bank protection can seem to be the only intervention which seems cost effective or decisive, but is this always the case? To be cost effective and environmentally sustainable there is a need to select the most appropriate approach for a given situation. Every river is different and every stretch of bank erosion is influenced by

balanced approach to its management

Photo 3: River Teign, Devon – Erosion of high sandy banks has created valuable habitat for nesting sand martins

site specific factors. It is important that the processes that cause the bank erosion and rate of change are understood prior to any action being undertaken. In some situations bank protection measures just displace the erosion or trigger additional erosion elsewhere, such as bed scour.

A common trigger of bank erosion, or mechanism through which erosion is accelerated, is grazing of the riparian zone. In this situation the first action must be to stop the grazing before considering the need to construct a revetment. However, frequently the immediate response has been to create a revetment. Often this is ad-hoc and formed from tipped material (*see Photo 4*) but on other occasions a more permanent revetment is constructed. In these circumstances, 'softer bank' protection techniques often composed of willow, are now being more readily prescribed and used. However, this is not without environmental impacts. Willows, for example, grow vigorously and can lead to impacts such as excessive shading or tunnelling and changes in the composition and character of the riparian zone by out-competing other species. They can also spread beyond the initial revetment and colonise other stretches of river bank or channel deposits. In some instances this can trigger channel capacity issues, increasing flood risk and adding to the river management burden.

Striking a balance

In recent years, for example, there has been a shift towards the assumption that 'softer' bank protection is the most environmentally acceptable form of protection. It often is, but the first question should always be whether any protection is necessary in the first place.

Only then can effective decisions be made as to whether bank protection is necessary and, if so, what form is most appropriate given the local conditions that exist at the site. Thinking holistically and then acting appropriately can provide opportunities to save time and money and achieve environmental objectives.

Managing rivers in a sustainable way is becoming increasingly important under initiatives such as DEFRA's Making Space for Water and legislation including the European Union Water Framework Directive. Both initiatives are likely to require more sustainable management of our river systems. Installation of bank erosion protection is unlikely to be considered such an automatic response in the future. Thus, developing appropriate solutions for a particular site must become standard practice. We should seek opportunities to reduce pressures on river banks and allow rivers space to adjust their form to changes in flow and sediment supply caused by climate change and land use.

Reference

Agate, E. and Brooks, A. 2003. Waterways & Wetlands a practical handbook. British Trust for Conservation Volunteers. http://handbooks.btcv.org.uk/handbooks/index/book/87

Note: These opinions are of the authors only and not necessarily their employer.

Photo 4: Ad-hoc bank protection on the Hawkcombe Stream, Somerset

News and Events

Update of the RRC Website

The RRC website has been modified and updated. Most notably we have:

- Changed the look of our homepage in order to make our website easier to navigate (**http://www.therrc.co.uk/**)
- Created a new 'Map of River Projects' page which identifies restoration projects, case studies and demonstration sites across the UK. This will be updated regularly as we update/collect more information. Many projects will not be included as we do not currently hold the 'full' details, so it is always worth contacting us to see what else has been undertaken in that area or region (**http://www.therrc.co.uk/rrc_case_studies.php**)
- Built a new 'Registering Your Project' form, making it much quicker and easier for you to provide us with details of projects that you have been involved with, or to update your project details (**http://www.therrc.co.uk/rrc_form_proj_reg.php**)
- Created a new 'Project Advice and Reports' page which details RRC's expertise and how we can assist with your river restoration project (**http://www.therrc.co.uk/rrc_projects_advice_reports.php**).

Please take a few moments to have a look at and explore the website. We would like to continue to improve the service that our website provides and would welcome your comments and feedback.

Conferences

4th ECRR International Conference on River Restoration
June 16th to 21st 2008 - Venice, Italy
For more information visit:
http://www.ecrr.org/conf08/home.htm

CIWEM Conference
Water Framework Directive Update
June 19th 2008 - London
For more information visit: http://www.ciwem.org/events/

FBA Annual Scientific Meeting
Science in Industry: The Application of Freshwater Science in Practice
July 15th to 16th 2008 - London
For more information visit: http://www.fba.org.uk/

12th Biennial Conference of Euromediterranean Network of Experimental and Representative Basins (ERB) - Hydrological Extremes in Small Basins
September 18th to 20th 2008 - Cracow, Poland
For more information visit: http://www.geo.uj.edu.pl/konferencja/erb2008/

FLOODrisk 2008: The European Conference on Flood Risk Management, Research into Practice
September 30th to October 2nd 2008 - Oxford
For more information visit: http://www.floodrisk2008.net/

Implementing Water Allocations
February 23rd to 26th 2009 - Port Elizabeth, South Africa
For more information visit:
http://ewa.innercirclestudios.co.za/downloads.html

Courses

River Restoration: Fluvial-Geomorphic & Ecological Processes
June 23rd to 27th 2008 - Beaumont du Ventoux, France
For more information visit: http://institutbeaumont.com/

Ecological Restoration of Mediterranean Rivers
June 9th to 14th 2008 - Zaragoza, Spain
For more information visit: http://www.iamz.ciheam.org/en/pages/paginas/pag_formacion6.htm

Books

Stream Restoration Design - National Engineering Handbook Part 654
U.S. Department of Agriculture (2007)
The Handbook can be downloaded from the following link:
http://www.policy.nrcs.usda.gov/media/pdf/h_210_654_14.pdf

Restoring Floodplains in Europe - Policy Contexts and Project Experiences
Moss, T., and Monstadt, J. (2007) IWA Publishing, London (ISBN 1843390906)

RRC is most grateful to all those who have contributed text or photos for this Newsletter.

The following statutory organisations provide core funding for the River Restoration Centre and their representatives form the Advisory Board who together with RRC's Directors make up the RRC Management Board.

Environment Agency · NATURAL ENGLAND · SEPA Scottish Environment Protection Agency · RIVERS Agency · SCOTTISH NATURAL HERITAGE · Department of the Environment www.doeni.gov.uk

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Cranfield UNIVERSITY **RRC is grateful for the continued support of Cranfield University.**