



River Restoration NEWS

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NEWSLETTER of the RIVER RESTORATION CENTRE

Tel/Fax: 01525 863341 Email: rrc@theRRC.co.uk

RRC's 2006 Annual Network Conference

This year we asked Peter Worrall (Penny Anderson Associates) to write an overview of the RRC's 2006 Annual Network Conference. Please read on and enjoy his very individual sense of humour.

It must be a sobering thought for the organisers of these conferences that bringing together some 230 scientists and practitioners with an interest in and concern for the environment runs the significant risk of generating feelings of pessimism about our future survival on the planet! Not so at the 7th Annual Network Conference. The abiding and recurrent impression that characterised this and previous conferences is one of a very dynamic field of work in which challenging and creative projects are pushing forward the process of sustainable environmental restoration. It is also pleasing to report that despite the number of years the conference has been running it has not become dominated by an exclusive clique of river restoration experts. Although there are the stalwarts in this field who have maintained the momentum for river restoration over many years, each conference sees a new cohort of research scientists, engineers, ecologists, social scientists, planners and landscape architects etc who



Conference delegates on the bank of the River Tummel

contribute new ideas and experiences to the 'art' of river restoration.

This is not to say that the conference conveys the sense that we know all the answers and that there aren't substantial challenges ahead for the river restoration movement. There was no sense of complacency at the conference and certainly not after the presentation by the first keynote speaker! Most river restoration practitioners at the conference hold dear to their heart the principle that if you can restore form and process in river systems then ecology and biodiversity will respond positively

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*For further information on the RRC and its activities please view the RRC website on:
www.theRRC.co.uk*

Amendments to Issue 23 of River Restoration News

Page 3 – Photos of Sinderland Brook River and Floodplain Restoration, Photo left: Restored course Phase 1 – September 2005, Photo right: Channelised course Phase 1 – July 2004.

Page 8 – FBA Annual Scientific Meeting will be held at Dorset Environmental Science Centre (formerly FBA River Laboratory) and not at University of Plymouth.

This principle is enshrined in numerous papers and restoration schemes and is no better put than in the work of Andrew Brookes. It was therefore a shock to be told by Steve Ormerod that we might be working in a 'field of dreams' by adopting this assumption. Once the initial wave of horror that we might have got it all wrong passed, we gathered from Steve that he was making an appeal for a clearer understanding of the ecology of restored rivers and that biological targets and post-project monitoring are often the forgotten elements in the rush to restore. If nothing else Steve's keynote address created lively debate and generated an appreciation that ecological monitoring is vital if we are to demonstrate that river restoration is cost-effective at providing the biodiversity we all tend to claim it does.

Retaining people's attention at conferences, particularly with a rapid turn round of papers can be difficult and some speakers certainly tried different ways of keeping the audience focused. To many, a review of the legal basis for river restoration might appear high on the 'dull-o-meter'. However, in Duncan Huggett's presentation attention was immediately achieved with the suggestion, by his wife, that the best way to keep the audience interested would be to remove an item of clothing for each slide shown. Although Duncan chose not to take this advice, the anticipation of what might have happened kept us all alert for what turned out to be a very clear review of the Environment Agency's legal capacities to support river restoration. This might have set a theme going for when Stuart Greig started his 5.30pm presentation by suggesting he was going to get his tool out once again, the heavy eyelids opened to see what he was talking about, which was a paper

concerning the development of a morphological impact assessment tool to support the implementation of the Water Framework Directive.

Perhaps the most dangerous tack to gaining attention was taken by one speaker, who should not be named, who made a somewhat politically incorrect connection between certain women and rottweilers, well it certainly woke the audience up.

As with all conferences there are numerous themes that become dominant and recurrent in discussions. One in particular was the role community involvement plays in determining the success of river restoration projects. Like the previous recognition of the need for geomorphologists and ecologist to work with engineers on restoration design, it now is becoming apparent that it is not wise to leave the social sciences as an after thought, particularly as this aspect of restoration may, in the end, be the critical measure of success. Having just returned from the World Environmental and Water Resources Congress in the USA, at which river restoration was a key topic, it was interesting to note that over half of their restoration schemes are deemed to fail within the first five years, and many of these are believed to have failed due to lack of appropriate and timely community involvement.

I was delighted to see the inclusion of sustainable urban drainage systems as a conference topic this year. Such systems can contribute significantly to urban biodiversity and provide functional components in habitat networks linking restored rivers into the wider urban greenspace. Additionally, SUDS may



The gravel bed River Tummel

support urban river restoration by providing a pollution buffer to streams and river systems thereby enhancing the potential of such schemes in meeting nature conservation targets.

For those of us who stayed for the site visit we were blessed with a warm, dry day with clear blue skies; an event in itself in Scotland. All enjoyed the opportunity to visit the River Tay and River Tummel, both spectacular gravel bed rivers. Much discussion prevailed about how best to manage such a mobile, inherently unstable river system. Perhaps, the highlight of the day however, was Dave Gilvear pointing out that in a high energy catchment it was still possible to find small backwater havens with fine sediment accumulation providing excellent Lamprey habitat. Right on queue one was spotted and was lavished with more attention than Martin Janes' new born baby (it's a girl!).

To a large extent, success in achieving networking at conferences rests with the people that organise and run the conference. As always Martin and his 'Team' did their best to bring the delegates together, especially by giving them time to meet and talk. Standing at bus stops was certainly a novel way of going about this and although our first night trip into Edinburgh may have seemed a little chaotic, Martin's 'cunning plan' of 'setting his watch' to ensure that we all missed the first bus, certainly left plenty of time to meet old friends and make new acquaintances.

Lamprey caught in action!

*For further information visit: <http://www.therrc.co.uk/conferences.htm>
Here you can download pdfs of the presentations and outcomes of the workshops.*

Planning is underway for the RRC 2007 Annual Networking Conference. We have provisionally booked the conference facilities at the University of Chester for 18th-20th April 2007. Keep an eye on our news and events page for confirmation and further details: http://www.therrc.co.uk/news_events.php

Cracking the Concrete The London Way!

On the 8th June the Greater London Authority hosted a one day conference with the aim to raise the profile of the Environment Agency's 'North London River Restoration Strategy' and highlight the opportunities for enhancing London's rivers for both people and nature.

To set the scene presentations were given about successful restoration schemes in London, (including the rivers Brent (Wembley), Quaggy (Lewisham) and Wandle (Sutton)). The River Restoration Centre added a wider national and international flavour. Photos of Seoul (South Korea) were shown with the message that 'where there's a will there's a way' to uncover and enhance even the most degraded of rivers. Here 5.8km of highway were removed and replaced with a newly restored river (all in 3 years)!

Concern over the pollution level of London's rivers through a combination of years of industrial use and sewer misconnections, which affect both sediment and water quality, was soon voiced. A parched audience, as temperatures soared to over 30°C, all agreed that, where this is a problem, the issue could not be overlooked, especially in the light of climate change which can only increase the pressure on precious water resources. However, these issues were seen as challenges to be overcome, rather than absolute blocks to progress.



(Photo above) Cheonggye Expressway covering the channelised river

(Photo below) Artists impression of restored Cheonggye river



One technique which could help and was eloquently raised in the keynote speech by the Deputy Mayor of London, Nick Gavron is that of Sustainable Urban Drainage Schemes (SUDS). The message was that this should be promoted in new developments.

The conference ended on a positive note. Whilst everyone acknowledged that many challenges remain, the overriding view was that all enhancement opportunities should be seized upon, with the ambitious aim of making London the world capital of urban river restoration. A key message was that as well as working with local authorities and greenspace managers, there is an urgent need to encourage developers to appreciate the wider benefits of river enhancement, both for the business community and for the people and wildlife of London. If not, city rivers could remain under concrete and memories of them as social focal points could be lost in the mists of time.

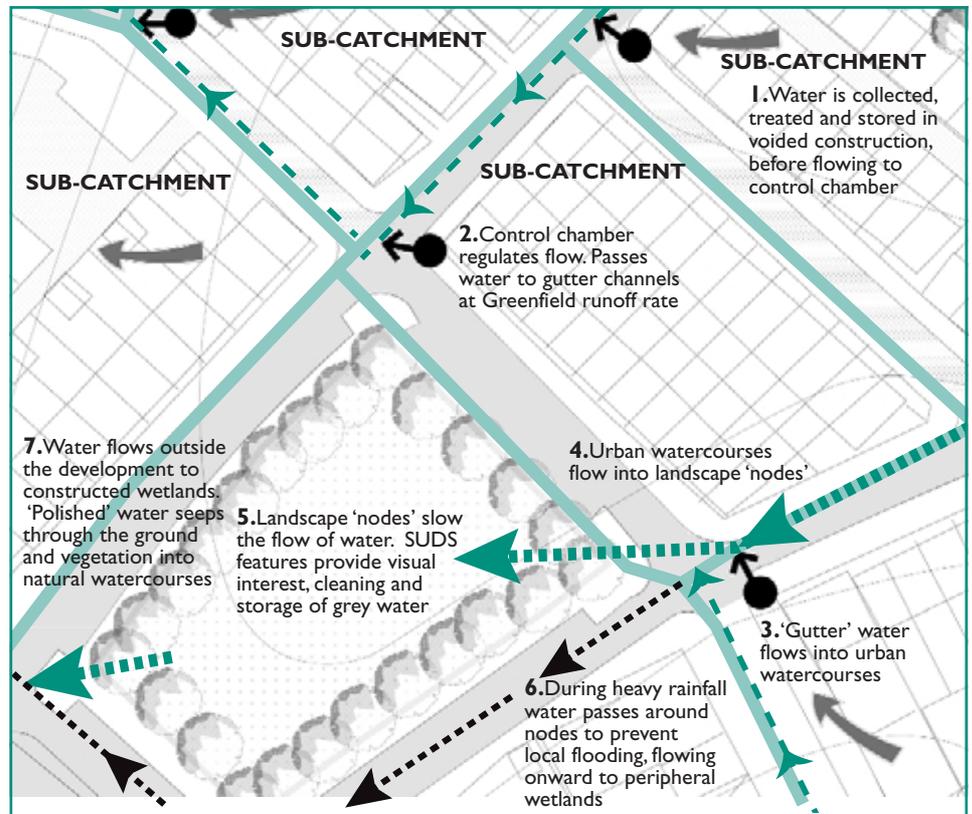
*The GLA would like to thank
WWF for their support of
this one day event .
For further information contact
Jenny Mant at the RRC.*

Integrating SUDS and River Restoration to protect and enhance Urban Watercourses

The Water Framework Directive has highlighted the issue of diffuse pollution. Robert Bray explains how a new approach to Sustainable Urban Drainage Systems (SUDS), informed by natural drainage patterns, can reduce urban runoff and contribute towards improving the water quality of our rivers.

The disciplines of sustainable drainage and river restoration share many objectives including the control of flows to watercourses, prevention of pollution and enhancement of the environment for wildlife and the community. Sustainable drainage is a new approach to managing rainfall that mimics natural processes, through incorporating a variety of landscape features to control the quantity and quality of runoff, rather than relying on traditional gully and pipe systems. When landscape features (such as filter strips and swales; filter drains and permeable surfaces; infiltration devices and basins; and ponds and wetlands) are used in series the concept is called the 'management train'. This concept concentrates on control of pollution at the source prior to managing runoff at the site and/or regional level.

Although SUDS have been advocated in Great Britain for over 10 years, examples tend to be isolated and rely on storm sewers as the main conveyance route. As a result new



Urban sub-catchment SUDS model headwater analogue

developments continue to pollute when the management train is inadequate; storm waters bypass the treatment system, cross connections link to foul sewage, or combined sewer overflows (CSOs) pollute watercourses after heavy rain.

A more radical alternative to traditional SUDS measures is therefore required in order to protect our wetlands and watercourses from damage by unrestricted flows, poor water quality and silt pollution. SUDS 'best practice' rises to this challenge. It is informed by natural drainage,

using the route taken by rain percolating to the headwaters of lowland rivers as a guide for sustainable drainage design. Rain falls on the landscape and is collected in a diffuse manner across the catchment, either percolating to permeable stone layers

or retained at the surface before entering streams directly from springs or other entry routes. The source of the River Thames, near Tetbury in Gloucestershire, offers a graphic illustration of how rainwater is collected and transported through permeable oolitic limestone. The result is clean water being delivered at a relatively constant rate to the headwaters of the River Thames.

This natural scenario informs a new SUDS model for urban areas in which 'development sub-catchments' are identified within which runoff is collected and cleaned, through a permeable pavement, before being stored in voided stone beneath the surface. Each 'sub-catchment' unit discharges clean water at a 'greenfield rate' (2 - 8 L/sec/hectare) of runoff into an urban watercourse. This may begin as a gutter but can become a visually exciting water feature flowing through the urban landscape to the edge of the development. Eventually, where

Permeable pavement over voided stone, Kingston Bagpuize, Oxon



the development meets the natural watercourse, water is directed into 'constructed wetlands' and trickles through 'seepage zones' to complete the 'management train'.

This SUDS model provides an effective headwater analogue and avoids the current problems of conventional drainage and pipe sewers. Wide scale implementation of SUDS can protect watercourses

by mimicking the natural headwater characteristics of lowland streams and rivers.

The proposed extension to the town of Harlow in the east of England has provided an opportunity to develop and apply this new approach to sustainable drainage through the incorporation of a series of landscape features to control the quantity and quality of runoff,

therefore creating an effective management chain, without the need for storm sewers, as well as an attractive urban environment.

For further information contact Robert Bray, Robert Bray Associates Limited. Tel: 01453 764885, Fax: 01453 765545,

Email:

bob@robertbrayassociates.co.uk

Website:

www.sustainable drainage.co.uk

River Wallington Restoration



The current canalised channel of the River Wallington

Nick Wright, Environment Agency, highlights another example of the potential for the introduction of SUDS into river restoration.

An exciting new opportunity for river restoration has now arisen within a major development area at Waterlooville in Hampshire. Running through the proposed 405 hectare development site is a concrete lined channelised section of the River Wallington. Grainger Trust along with the Environment Agency has a timely opportunity to restore this reach. The aspirations for the restoration will be to increase biodiversity, create quality habitats, reduce flood risk, and provide a pleasant amenity area for existing and future communities.

The River Wallington has a chalk baseflow with heavily urbanised headwaters. Its course flows through largely agricultural land to discharge into Portsmouth Harbour. The section of river in question comprises of a 750m concrete trapezoidal channel, of reduced ecological value and in need of remedial work. In its present state the channel has no connectivity with its floodplain, the proposed natural channel will reinstate connectivity and offer more capacity for floodwater storage and attenuation.

In addition to the restoration works, Grainger Trust has incorporated sustainable urban drainage systems (SUDS) within the development site masterplan. As the dominant substrate is London clay, the SUDS

features identified most suitable for the site will be swales, attenuation basins, ponds and wetlands. The Environment Agency has set up a research project to assess the impact of SUDS on the catchment which has historically suffered from flooding and water quality issues. This will be a valuable opportunity to quantify the catchment's characteristics before, after and during the implementation of the SUDS, which to date no other UK based project has achieved on this scale.

The development has been selected as an exemplar for future developments, as the area is within the Solent Gateway region and included in the South East plan. The project will produce a best practice guide for future developments, and hopefully influence local industry towards more sustainable drainage solutions.

The project is nearing completion of the base line monitoring stage, the river restoration designs are currently being jointly formulated via the Environment Agency and Grainger Trust.



The River Wallington downstream of Waterlooville illustrates what this restoration project is aspiring to achieve

For further information on this project please contact: James.Addicott@Environment-Agency.gov.uk

Restoration of the River Rother at the Avenue Site in Chesterfield

The presence of contaminated sediment at a site often limits its potential for river restoration. Suzanne Hewitt (Jacobs Babbie) unveils a proposed river restoration project on one of the most heavily contaminated sites in the UK.

Introduction

The River Rother runs through the Avenue site, a former colliery, coking works and chemical plant located in Wingerworth, 3 km

The main aim is to transform the Avenue site such that it becomes commercially viable and a community asset. 'Best Practice' remediation techniques will be



(Figure 1)
Aerial view of the Avenue site, a former coking and chemical works

south of Chesterfield (Figure 1). Restoration of the River Rother is proposed as part of the remediation works at the 100 Ha Avenue site, funded by national regeneration agency English Partnerships through the National Coalfields Programme. The plans for the Rother are described in the context of one of the most heavily contaminated sites in the UK.

Background

Pollution is present on-site within tar lagoons, a waste tip, soils and groundwater in the form of coal tars, lime sludge, acids, phenols, asbestos and heavy metals. Significant seepage from one of the lagoons (Figure 2) in the past has left the River Rother in the vicinity severely polluted.

applied to reclaim the site, which will then form a part residential, part light industrial/commercial area with public open space and amenities. The landscaped area

(Figure 3), which has the support of Derbyshire Wildlife Trust and has been approved by the Environment Agency, will comprise:

- Public Amenities (footpaths, fish ponds, scenic views)
- Flood Defence (embankment dam)
- Ecological Enhancement (realigned and reprofiled river, creation of wetlands and reed beds)
- Linear Water Feature

The River Rother

The River Rother rises in the hills of Clay Cross 10 km south of the site. The river flows in a northerly direction parallel to the eastern boundary of the site and meanders west passing under the London to Sheffield railway and bisects the north of the site adjacent to the two waste disposal lagoons. In an attempt to reduce pollution from the lagoons, the course of the river has been diverted on two occasions (Figure 4), however the

(Figure 2)
Tar lagoon which is a point source of pollution to the River Rother





(Figure 3) Conceptual drawing of the remediated Avenue site

floodplain remains heavily contaminated. This alluvium - and other sediments - will be treated on-site using innovative methods and re-used for landscaping. It is estimated that the volume of materials requiring treatment across the site is 600,000 m³. A remediation strategy for the River Rother downstream of the Avenue site is also being jointly prepared with the Environment Agency.

The on-site restoration length of the River Rother is approximately 555m. A cascade feature at the upstream end will link the water feature to the river. The river meanders through the site with a wet grassland to the north and reed beds to the south. An embankment will be constructed at the downstream end as a flood defence. The wetland and reed bed area will be inundated during floods and act as a water storage area until the flood flows subside.

The river will retain its relatively low gradient meandering course (0.0013 mm⁻¹). Estimated specific stream power is between 6 and

8 Wm⁻² which suggests that siltation may be more of an issue than erosion. The channel cross sections have therefore been designed with this in mind and have been based on the dimensions of the more natural sections of the River Rother upstream. Asymmetrical sections have been designed for tight and soft bends, and a two stage channel for the straighter sections. This will improve sediment transport efficiency and morphological diversity.

The silty-clay alluvium which will be removed, treated and replaced will retain its cohesiveness and should create stable banks. A suitable thickness of alluvium will be used to line the channel and a granular backfill will help form the required landscape topography. Vegetation, once it has become established, will further stabilise the banks.

Wet grassland and reed beds

The wet grassland to the north of the River Rother realignment will consist of ridges and furrows providing different water levels that can support a range of wildlife including birds, water voles, grass snakes and great crested newts. Backwaters provide additional habitat and a permanent source of drinking water for grazing cattle. A stock proof fence will be erected to prevent poaching (trampling) of the riverbanks and to allow the development of a complex riparian zone. Planted coir rolls will be used in areas vulnerable to erosion such as backwater entrances and will provide additional habitat opportunities for wildlife. A penstock with flap valve provides a controlled limit of water to the wetland area. The reed beds comprise open pools and dyke systems and will be controlled passively with fixed weirs. Boardwalks and dipping platforms will provide public access to the reed bed areas.

Summary

This challenging and innovative project will transform an area of extreme environmental degradation into one that will be renowned for its integration of sustainability, landscape development and management. A network of infrastructure, open space and new habitats will be formed for everyone to enjoy and the cleaning up of the source of pollution of the River Rother will inevitably enhance the riverine environment.



(Figure 4) The River Rother has twice been diverted away from the tar lagoon

This restoration project is still in its design stage. The remedial work to treat the contaminated material on-site is planned to commence next year, with the landscaping and river restoration element proposed for 2010. We will keep you posted!

The Avenue is one of over one hundred sites transferred from British Coal to English Partnerships. The site was handed to East Midlands Development Agency (emda) as English Partnerships' delivery agent in April 1999. Jacobs Babbie was commissioned by emda as principal consultants in the remediation and redevelopment of the site.

Acknowledgements

Phil Reeve (emda) Jon Smithson, Brian Sims, Natalie McIlidowie and Anke O'Donnell (Jacobs Babbie) Richard Catling (TEP).

News and Events

Conferences

Water and the Landscape: The Landscape Ecology of Freshwater Ecosystems

September 5th – 8th 2006 – Oxford Brookes University

For more information visit

<http://www.iale.org.uk/conference.html>

Salmonids in the 21st Century, 15th International Salmonid Conference

October 17th – 20th 2006 – Newcastle, Gateshead

For more information visit

http://www.associationofriverstrusts.org.uk/salmonid_conf/index.htm

World Wetlands Day Conference

January 31st - February 1st 2007

For more information visit

http://www.ciwem.org/events/Conference_ProgrammeMASTER0306.doc

The Association of Rivers Trust (ART) annual awards

ART will be holding its annual awards ceremony at the International Salmonid Conference (*see above*). Nominations are welcome under four themes. For more information visit www.associationofriverstrusts.org.uk and follow the link to the International Conference, or call Alan Hawken on 01726 822343.

Book Review

'Monitoring Stream and Watershed Restoration'

P. Roni (2005). *American Fisheries Society, Maryland. Pp. 329, ISBN: 0 85199 907 7. Cost £40.00*

Given that river restoration project numbers grow day by day, there are a host of different approaches and techniques, and much debate over the effectiveness of river restoration in improving ecological and environmental quality. Nonetheless, there is a limited amount of monitoring undertaken often due to lack of funds even when the cost of the restoration activity itself is large. This makes it all the more important then, that when project planners are enlightened enough to budget in monitoring, that it is done well. This text makes an invaluable contribution to guiding scientists and river managers on how to monitor effectively. The book provides a comprehensive analysis of the underlying principles and approaches to river restoration monitoring, using a wealth of case study material, that will help readers to design monitoring programmes, decide what to monitor, and how, at the basic level, to implement the monitoring in the field.

Overall this is a scientifically sound, well written and well produced book that should be read and consulted whether the individual be involved in river restoration as member of the scientific or practitioner community.

Note: This is snapshot of a more detailed review completed by Dave Gilvear. If you need further information please contact the Centre.



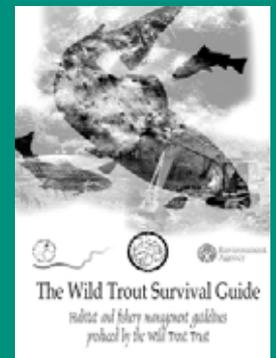
New Staff

We would like to welcome Alice Fellick (left) as the newest member of the RRC's Staff. Alice has taken over the role of Information Officer from Chris Banks who left in March in order to pursue his interests in sustainable energy.

The official launch of 'The Wild Trout Survival Guide' took place on 29th June 2006.

This book is a practical and inspirational manual on how to create ideal conditions for wild brown trout to flourish. Based on the acclaimed WTT 'Guidelines for Trout Habitat Restoration' produced in 2000 and expanded to 72 full-colour pages, it has been updated, improved and illustrated throughout with specially commissioned drawings, designs and case studies.

The guide is aimed at those wishing to start their own wild trout conservation projects. It takes the reader from assessing their stretch of water all the way to project-design, planning, funding and dealing with red-tape. The emphasis throughout is on sustainable restoration and management, that will not only benefit wild trout populations but also deliver gains to local biodiversity.



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 Council.

