River Restoration NEWS

Issue 36 July 2010

Newsletter of the RIVER RESTORATION CENTRE

The Kennet at Avington

Also in this issue...

The Kennet is one of the UK's premier chalk rivers and is designated as a Site of Special Scientific Interest (SSSI). However, human influence has been substantial and in places the physical habitat is far from satisfactory. **Paul St Pierre** (*Environment Agency*) details restoration work aimed at improving a 1.8km section of the Kennet on the Avington Estate.

The Kennet

by **Paul St Pierre**
(*Environment Agency*)

Background

The Avington Estate lies upstream of Kintbury, between Newbury and Hungerford. Significant sections of the river Kennet have been impacted by land drainage, extensive dredging, straightening, widening and landscaping, as well as impoundment by historical structures designed to feed water meadows. The result is an over-deep and wide channel, with sluggish flows, and valuable salmonid spawning gravels are either absent altogether, or smothered in thick layers of silt. Beds of Water-crowfoot (*Ranunculus)*, seen in reaches with more appropriate physical habitat and water level management, are conspicuous by their absence in the degraded sections. Many structures create a total blockage to fish migration and the majority of the river was deemed unfavourable under SSSI classification.

To rectify this, the Environment Agency in partnership with the Estate and Natural England, contracted Cain Bio-Engineering, Land and Water Services, Windrush AEC and Halcrow to produce and implement a project to restore 1.8km of river. This was delivered in two phases over two years.

Typical impounded reach at Avington

Before (inset) and after pictures of the bypass channel structure during ***phase I***

Note *raised head allowing fish passage to upper channel*

Phase I

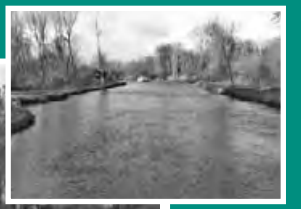
Objectives aimed to restore a more natural flow regime by removing a weed rack which was having a significant impounding effect on flows at the lower end of the reach, and fully opening a large set of sluices towards the top of the reach. As some of the main river was so wide as to render physical restoration unfeasible, a secondary side channel was used as the main SSSI channel. Fish passage was aided by using artificial riffles to raise the head sufficiently so that most species of coarse and salmonid fish could move through freely.

These works increased velocities and significantly reduced depths and widths.

Phase II

The work built on Phase I in aspiring to create a far more natural, self sustaining channel exhibiting the geomorphological processes and habitats that would be expected on a chalk river. Several techniques were used, dictated by the presence of protected species - notably water vole, on much of the Estate - the availability of suitable materials, angler access, and ease of access for machinery.

In the upper reach the significant drop in the head of water left banks disconnected from the river, but with water voles absent, the banks were effectively pushed into the river to create a narrower channel. Banks were fronted with dug turfs that were transplanted from the original bank to encourage rapid marginal colonisation. The non-angling bank section was narrowed using site won brushwood. Local gravels complimented areas of natural gravel and these were jetted to remove compacted silt.



Upper channel before (inset) and after restoration. Sluices have been fully opened and the channel narrowed.

To narrow the channel downstream, excavations were made at or behind the existing bank line, with material won used to create a new bank toe. The area excavated was left as a backwater feature. On the opposite bank, where water voles are present, the excavator was kept 2-3 metres back from the bank edge to limit burrow compaction. Gravel was excavated from behind the banks, and the long reach excavator placed this material in the river to create a causeway.

On the lower reach with water voles present along the entire length, banks had to be preserved and exclusion zones were set up for heavy machinery. To narrow the river, gravel won from site was used to create causeways. These were topped with soil and transplanted turfs were placed on the toe. Site won gravel provided a suitable substrate. Where gravel was not readily available, brushwood was used to create mattresses. Trees were driven into the banks or secured with posts and wire to help create in-stream flow diversity.

Phase II has dramatically improved the physical habitat and improved fish passage upstream, with all parties working together to deliver a sustainable solution.

Where water voles are present, material was excavated from behind the bank and a new causeway created with woody debris incorporated as an in-channel feature.

For more information on either project, contact Paul on **paul.stpierre@environment-agency.gov.uk**

THE RIVERFLY PARTNERSHIP

The key to public participation in monitoring river restoration?

Judy England (*Environment Agency*) and **Bridget Peacock** (*The Riverfly Partnership*) present one of the Partnership's latest projects.

The Riverfly Partnership is a network of more than sixty partner organisations, representing anglers, conservationists, entomologists, scientists, watercourse managers and relevant authorities, working together to:

- **protect the water quality of our rivers;**
- **further the understanding of riverfly populations;**
- **actively conserve riverfly habitats.**

Integral to the process is monitoring. Riverfly populations reflect the health of our rivers as sensitive indicators of water quality and are commonly referred to as the rivers 'canary'.

The Angler's Monitoring Initiative

The Angler's Monitoring Initiative (AMI) is a project where trained volunteer groups monitor (usually monthly) the water quality of their rivers by recording the abundance of pollution sensitive invertebrate groups, seven of which are riverflies. Should abundances fall below a site specific level, groups alert the relevant statutory body for further investigation; and it has been successful as a tool in winning prosecution cases.

The AMI has so far been used to monitor for adverse impacts such as water quality deterioration, siltation or habitat disturbances and to assess the recovery of rivers such as the Wandle in south London, following a serious pollution incident. The results showed recovery to be much swifter than Thames Water, the Environment Agency and the monitoring group expected. In addition to ensuring an informed dialogue on water quality between trained groups and the statutory bodies, there is great potential to use the AMI technique to assess the success of river restoration schemes.

How we monitor

The AMI uses an abundance score based on the identification and recording of key Riverfly groups. Samples are collected using a standard kick sampling technique and the abundance of riverflies and freshwater shrimps recorded are used to calculate a weighted abundance score. For all monitoring initiatives, the scores recorded at a site are calibrated against the results collected by the statutory Agencies.

Case Studies

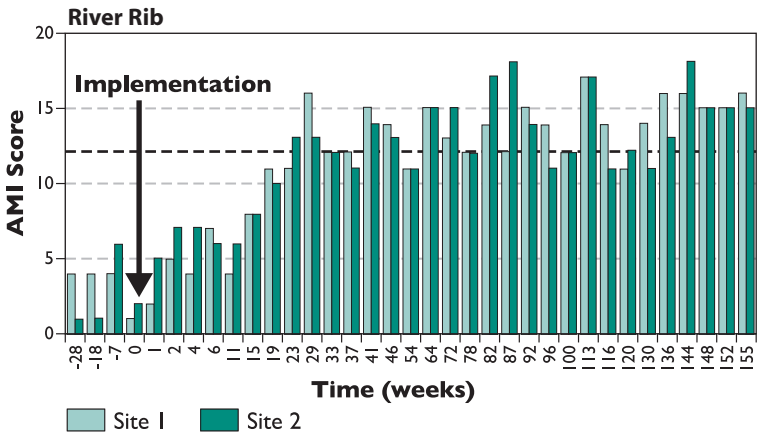
Since the distribution and abundance of riverflies is influenced by the habitat quality of a waterbody we wanted to test the **applicability of this technique to monitoring and assessing a river restoration scheme**. Two schemes were selected for this trial – ***the River Rib in Hertfordshire*** and ***the River Chess in Buckinghamshire.***

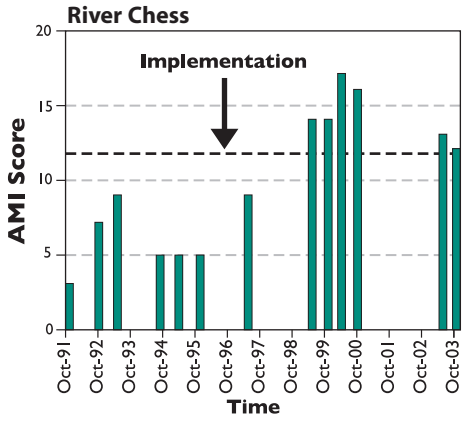
River Rib Restoration

This project, completed in 1997, aimed to restore a straightened, dredged and heavily impounded channel and in turn provide a more natural riverine habitat composition. A less degraded section upstream was used as a template. As part of wider appraisal of the scheme, invertebrate monitoring was undertaken before and for several years after the work. These have been used to calculate the AMI values, and a target AMI value was based on data from the template site – *indicated by the dashed line*.

Results

- Prior to the restoration there were only limited populations, however, within 23 weeks following implementation both sites supported riverfly and shrimp populations equivalent to the target site.
- Invertebrates were able to spread quickly as flies colonised the newly restored section.
- A full recovery of the more sedentary invertebrate species such as snails and leeches was much slower taking three years for full recovery.





River Chess Restoration

At a site on the Chess, restoration in 1996 aimed to reduce the impoundment effect of the weir, restore flowing water conditions and change the substrate to be gravel dominated. As with the Rib, results from an upstream site were used to set the target for the site - *indicated with the dashed line*.

Results

- Prior to restoration, the number of riverflies and freshwater shrimps was limited.
- Following restoration, the numbers increased, reaching the target level within a couple of years.


© Judy England

Further Reading

The collapse in invertebrate communities in UK rivers is further detailed in chapter 22 of a new book, ***Silent Summer: The State of Wildlife in Britain and Ireland*** published in May. Cyril Bennett, a researcher with the Riverfly Partnership, links the general collapse in riverfly populations with the growing use of pesticides on sheep and cattle.

Source: ***Sunday Times (2010)***

Conclusions

- AMI could be a helpful tool in assessing restoration recovery–especially those with a focus on improving salmonid fisheries, where it is important to understand that a food source is available.
- By linking AMI with fixed point photography, valuable information about the response to restoration measures could be gained.
- AMI can engage stakeholders and promote local public participation in restoration assessments, in turn improving understanding of the project.
- Information collected before a scheme helps justify restoration, may identify limitations of water quality and provide the baseline against which improvements can be assessed.

If anyone is interested in participating in an AMI or trialing methods on their schemes, **please contact the Riverfly Partnership (*www.riverflies.org*).**

The RRC Annual Networking Conference 2010

This year it was the turn of York University to extend a cheery welcome to 200 "conference people who dawdle about, get in the way and clog up the car parks".

Jenny Wheeldon (*Natural England*) gives her take on the week's events.

Day 1

Keynote

Keynote speaker **Hans Ole Hansen** kicked off the conference by talking about the Danish EU-LIFE project to restore that well known "Tiger of Europe", the Houting. The project's experience of issues such as the impact of low-head hydro-schemes on sensitive rivers, and creating innovative land swapping policies are all highly relevant to the management of UK and Irish rivers. If the scale and ambition of the project is anything to go by, the Houting may be roaring in Denmark's' restored rivers very soon.

WFD

Jimmy King stressed the importance of the WFD and Habitats Directive as a lever for restoration of Irish rivers while **Roy Richardson** outlined progress with river restoration in Scotland, stressing its importance to ecosystem services, including tourism. Measures being put in place in Scotland (SEPA's restoration fund for multi-objective projects, new powers for restoration and a more natural approach to flood risk management) have many parallels to those developing in England. **Duncan Huggett** finished the session with a call to quantify flood risk benefits delivered by working with natural processes on behalf of the Environment Agency. Building in climate change resilience and looking for multiple benefits are also key restoration targets, and there is now the political impetus - but we need the evidence base.

Further sessions explored the influence of the WFD on river management, the current shift from policy development into practice, and detailed several recent multifunctional restoration schemes. The "Your river, your views" session gave some clues as to how to quantify the social benefits of river restoration. The Living River Project will shortly produce a guide to simple evaluation tools for measuring the effect of community engagement in river restoration. The final speakers covered how to get to grips with sediment issues on a catchment scale, restoration techniques to reduce in-channel sedimentation and the use of natural Sequence Farming in Australia to rehabilitate seriously incised channels.

Down Time

The evening saw the delegates enthusiastically "networking" until the early hours. Despite his impending retirement after 300 years of EA service, Allan Frake was seen still networking at 1 am - dedication indeed.

Day 2

Day 2 began with the unusually perky delegates hearing about developments in whole river restoration planning and urban river restoration. The challenges of developing and implementing whole river restoration plans on the Hampshire Avon, Eden, Derwent and Kent highlighted the difficulties of restoring rivers in the context of existing land use.

Serious networkers then got some fresh air on a site visit to Tang Hall Beck, whilst the more alert applied themselves to workshops on decision support tools, hyporheic zones and the PRAGMO appraisal guidance.

In the afternoon, 3 parallel sessions tackled the assessment of restoration potential, designing form and function and in-channel barriers. The session on in-channel barriers showed that with their removal increasingly being considered, we need to rapidly improve our understanding of when it is beneficial to do so, and the associated risks.

Finishing Off

In the final session, speakers **Helen Dangerfield** and **James Holloway** outlined important lessons about monitoring arising from two of the more comprehensively studied restoration projects. I then concluded Day 2, returning to the theme of whole river restoration plans, which are being developed for over 20 SSSI designated rivers. Common challenges in whole river restoration planning include effective consultation with landowners, removal of structures, and how to include dynamic rivers in agri-environment schemes. The intention is that experience on designated rivers can inform measures to restore the wider river network under the WFD. Those with more stamina basked in the warm Yorkshire sun on site visits to the Birkby Nab flood storage reservoir and Galphay Mill on the river Laver on the Friday.

Finally then, another excellent RRC conference came to an end, with the event being as well planned, thought provoking and enjoyable as ever. The RRC even managed a spectacular surprise by co-ordinating the event with a volcanic eruption. Plans are already afoot for an alien invasion next year.

Thank you to all of our Conference Sponsors for 2010

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RRC Message Board

ANNUAL CONFERENCE
2011 - A Date for your Diary:
13th - 15th April at the University of Nottingham. See overleaf.

MEMBERS SECTION
Site Visits:
Free to all RRC members, the first of this summer took place on the 1st July in Newbury. Others are to be announced shortly by email, on our website and through Facebook. Please book A.S.A.P. to avoid disappointment.

What would you like to see?
If you would like to host a site visit or would like to see the RRC organise an event, please get in touch with us by email or through Facebook.

RIVERS OF THE FUTURE DVD
The RRC Video "**Rivers of the Future**" on the EU-LIFE restoration projects on the rivers Cole and Skerne is now available on DVD. Contact the RRC for a copy.

FACEBOOK UPDATE
Exciting new news links, upcoming events & the **2nd RRC blog**. We want to hear from Msc & PhD students about your research. Follow us by searching for 'The River Restoration Centre'.

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Recent Project Updates and Events

Fish pass opened at Calder weir on River Derwent in March ● Site visit to see enhancement work at East Chisenbury on the River Avon in June ● RRC Guided Site Visit to the River Lambourn hosted by Paul St. Pierre of the Environment Agency in July ● Launch of the Mayesbrook Park Landscape Master plan: The UK's First Climate Change Adaptation Public Park (with integrated river restoration) in July ● Flood and Coastal Risk Management 2010 Conference in Telford attended by the RRC in July.

RRC Guided Site Visit to the River Lambourn in Newbury

Please contact us through email or Facebook to update us on projects being undertaken.

Events

The Conservation and Management of Rivers - 20 Years on:
6th - 9th September
University of York.
For information, mail to:
RiversConference2010@jncc.gov.uk

IWA World Water Congress and Exhibition:
19th - 24th September
Montréal, Canada.
Invitation to register & preliminary programme:
www.iwa2010montreal.org/

International Conference on Water in Mountains:
22nd - 24th September
Mégève, France.
Flyer on themes available:
http://www.riob.org/spip.php?article1709

Riverfly Partnership Conference - Your Rivers - Their Future:
23rd September
The Natural History Museum London.
For information:
www.riverflies.org/index/conferences.html

Integrated Water Management Conference - Priorities and Direction:
21st October
Hamilton House, London.
Bookings are now being taken:
www.coastms.co.uk/conferences/435

Participate in the 12th Annual Networking Conference

13th - 15th April 2011 – University of Nottingham

Managing rivers at the local and catchment scale under the Water Framework Directive

Meeting the requirements of the WFD needs to be demonstrated by the competent authorities. Given universal spending cuts, it is expected that this will be implemented through a mix of river restoration measures and best practice river management approaches. These will require careful management and effective use of resources. This is likely to lead to new initiatives about how to achieve this on-the-ground and how best to define cost-effective ways to increase an evidence base of success. The RRC's annual networking conference is an ideal forum to exchange ideas.

As always, we are open to suggestions in terms of themes, but are particularly interested to encourage discussion about the following:

River Basin Management Plans have identified **progammes of measures.** What **river restoration technical knowledge** is available to ensure these measures are successfully implemented for different river systems across the UK?

River management, including maintenance, must consider working with **natural processes** in concert with reducing **flood risk**. Papers that demonstrate new ways of implementing on-the-ground management plans which can also achieve WFD objectives will be welcome.

Partnership schemes between government-funded bodies, **local authorities**, **developers** and **community groups**, are an important element of stakeholder engagement and delivery of projects. Papers that demonstrate how this is being implemented at the local level *and* what needs to be considered to achieve good partnerships and delivery of schemes will be of interest.

A full call for papers will be emailed shortly but if you are interested in presenting a paper, please contact the Centre for more information. The submission deadline will be in Autumn 2010, with the date TBC.

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 All of nature for all of Scotland · NIEA Northern Ireland Environment Agency www.ni-environment.gov.uk

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