River Restoration NEWS

Issue 8
March 2001

NEWSLETTER of the RIVER RESTORATION CENTRE

Working to restore & enhance our rivers

Another successful RRC workshop

Inspired by the enthusiastic response to the Rural River Rehabilitation and Sustainable Land Management workshop some months ago, in January 2001 the River Restoration Centre organised a two-day chalk river restoration seminar in collaboration with the Environment Agency and University of Hertfordshire. The main objective of the seminar was to facilitate and encourage interchange of information, experiences and ideas between those already working on projects associated with chalk rivers and streams.

The first day of the workshop was split into eight sessions, each led by two facilitators charged with introducing the session and then leading and stimulating discussion amongst the 30 participants. Themes ranged from the practicalities of flow restoration to the mechanisms for effectively engaging local communities and land owners. Day two was spent out in the field on a series of site visits organised by the Environment Agency, Thames Region.

After a lively discussion it became apparent that the costs and practical difficulties of chalk river restoration reinforce the need for further sharing of information and experience, and production of good practice guidance to make the most of limited resources. Collation and dissemination of information and experience is core to the aims of RRC, but its effectiveness in fulfilling this role is dependent on everyone reading this newsletter submitting information on their projects to the Centre. Pro-formas can be downloaded from the RRC website or filled in on-line and returned to RRC. (Submitting information http://www.theRRC.co.uk)

Chris Catling tells participants about restoration of the River Colne, Watford

The workshop report is currently being compiled by Vyv Wood-Gee (Countryside Management Consultant). For a free electronic copy of the report contact RRC.

RRC's 2nd ANNUAL NETWORK CONFERENCE

Keynote speaker: **Baroness Young, Chief Executive, Environment Agency**

Where? – **Britannia Hotel, Coventry**

When? – **Monday the 23rd and Tuesday 24th April 2001.**

Cost? – £165 for RRC subscribers and £190 for non-subscribers

AND RRC GEOMORPHOLOGY WORKSHOP

Where? – **Same venue**

Where? – **Wednesday 25th April 2001**

Where? – £165 for RRC subscribers and £190 for non-subscribers

If you have not already expressed an interest in the Conference and/or Geomorphology workshop and still wish to attend please contact the centre ASAP. Further details and finalised costs will be sent out shortly.

INSIDE THIS ISSUE

The River Restoration Centre, Silsoe, Beds. MK45 4DT

Tel/Fax: 01525 863341 **Website: www.theRRC.co.uk** **Email: rrc@cranfield.ac.uk**

The Sustainable River Management Project

Elaine Fisher from the Environment Agency's North West region tells RRN how they are improving their rivers by influencing land-use.

The North West region encompasses Cumbria, Lancashire, Cheshire, Greater Manchester and Merseyside, with over 80% of it rural. Therefore the majority of river catchments are influenced and shaped by rural land-use practices such as farming.

Many farming activities have the potential to exert major impacts on river systems. The more obvious include chemical use (e.g. sheep dip) and waste disposal (e.g. slurry), that can cause serious pollution incidents. Less obvious is the impact caused by the use of the land (e.g. live stock density or arable practices), that can affect both river habitat and function on a catchment scale.

Historically, it is often the symptoms of a problem that have been tackled, rather than the source. For example, sediment is regularly removed from rivers to reduce flooding risk and clear fish spawning areas. It would be more sustainable to reduce the amount of sediment entering a river. This, however, would require a change in land-use

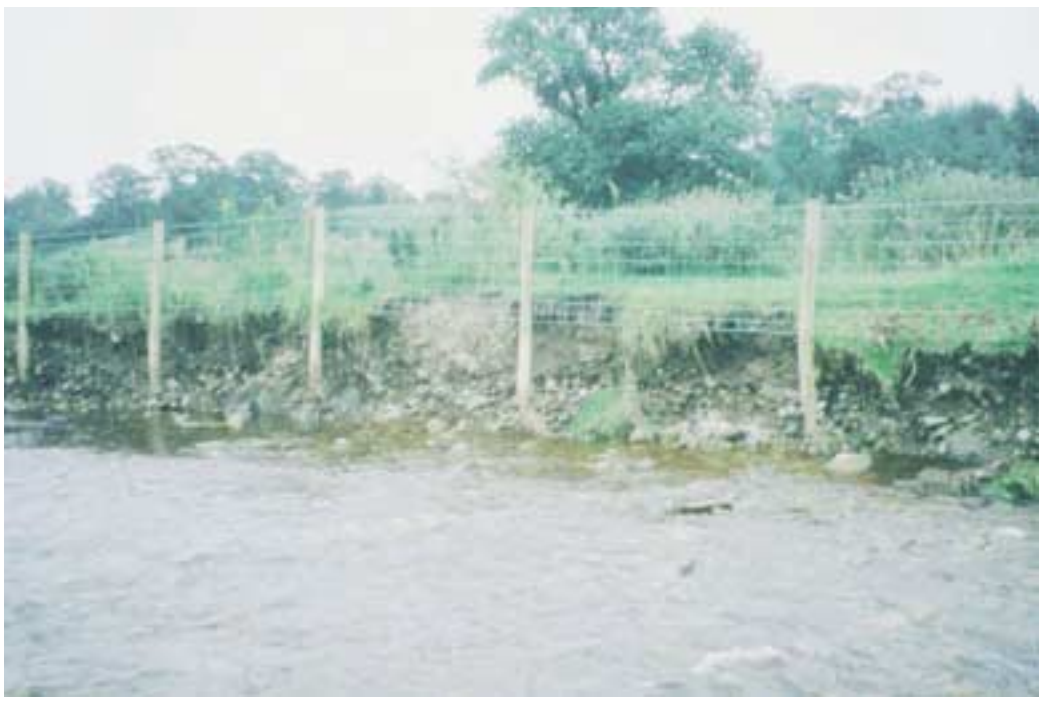
The Sustainable River Management Project started in 1998 and aims to tackle catchment-scale issues at source. Focussing on rural land-use, the project aims to influence land-use practices across three target catchments in the NW region.

The first three catchments targeted were:

- The Ehen in Cumbria, designated as a candidate Special Area of Conservation for the freshwater pearl mussel. Riparian land-use has been highlighted as a major factor in the decline of this species.
- The upper Ribble in Lancashire, an important salmonid fishery believed to be affected by sedimentation.
- The upper Weaver in Cheshire, a lowland river running through a catchment of intense agriculture.

A typical problem – intensive land use and river restoration

More recently the Ellen catchment in Cumbria was also included and the project joined forces with the Bowland Initiative in Lancashire.



A lesson learnt – fencing must be set well back.

Influencing Rural Land-use

To influence land-use we promote to landowners the importance of farming practice on the health of the river. To do this we collaborated with the Farming and Wildlife Advisory Group (FWAG), an independent charity that provides advice to landowners on how best to combine profitable farming with environmental improvement. FWAG acts as a conduit between the Environment Agency and the farmer, producing a confidential farm-wide report assessing the environmental impact of everyday operations and highlighting environmental assets. FWAG also assists with grant applications to encourage uptake of best practice advice.

Joining the River Restoration Centre

If you are not a member of RRC, and wish to continue to receive the Newsletter, know more about the activities and outputs of the Centre, and also contribute to widening the Network of sharing experiences and knowledge, please contact us.

We also talk to organisations involved with rural land-use policy, and explore areas of common interest. By focussing the project to address land-use practices that have most potential adverse effects on rivers, we have been able to target grant schemes to the catchments.

Involving Land Owners

To involve landowners, all farmers of a catchment were mailed information about the project and invited to an official launch. The mailshot and resulting media coverage ensured a high profile locally which was maintained using the media as much as possible, including an advert in the monthly NW National Farmers Union (NFU) journal which reaches 8,000 farmers in the North West.

Social events played a key role, and were often based around demonstrations of good practice. In each catchment, livestock were excluded from a stretch of river to demonstrate the effect livestock can have on river habitat. Each demonstration site was an average of 1km long, and fenced on both sides (average buffer 3m, but varied according to site and landowner interests). The demonstration stretches provided the focus for farm walks, where farmers could discuss best practice ranging from the methods of conserving soil, to the practicalities of keeping stock away from a river.

Monitoring

Various monitoring projects have taken place on the target catchments. All target catchments have been surveyed using River Habitat Survey and underwent a fluvial geomorphology audit. The results of survey on the Ellen catchment allowed FWAG effort to be targeted more effectively at farms having most impact on the river system. These were identified as accelerated sedimentation from tributaries, and these have been targeted for additional Stewardship grants and stock exclusion initiatives.

The 1km fenced demonstration sites have been subject to more intense monitoring. The results of a three year monitoring programme on the effects of excluding livestock from the river, using geomorphological, hydrological and biological techniques, will soon be available. Without pre-empting the findings, the Ribble catchment site is an example that has witnessed a major recovery in marginal and bankside vegetation, in total contrast to the unfenced control stretch. Detailed channel profile cross-sections have been taken in an attempt to assess how much sediment release from the banks into river has been reduced. A linked PhD study is also being undertaken on the Ribble catchment looking at the links between river geomorphology and land-use practices.

Success!

The project has raised the profile of the importance of farming activity on river health throughout the North West. The amount of information and advice provided to farmers on the target catchments has been remarkable. It is difficult to do justice to all those involved on each catchment in a brief article, and there have been many successes and lessons learnt throughout the project.

The catchment events have been very well attended and FWAG have visited over 500 farms, given advice on over 49,000 acres, 280km of river, and produced 260 farm waste management plans.

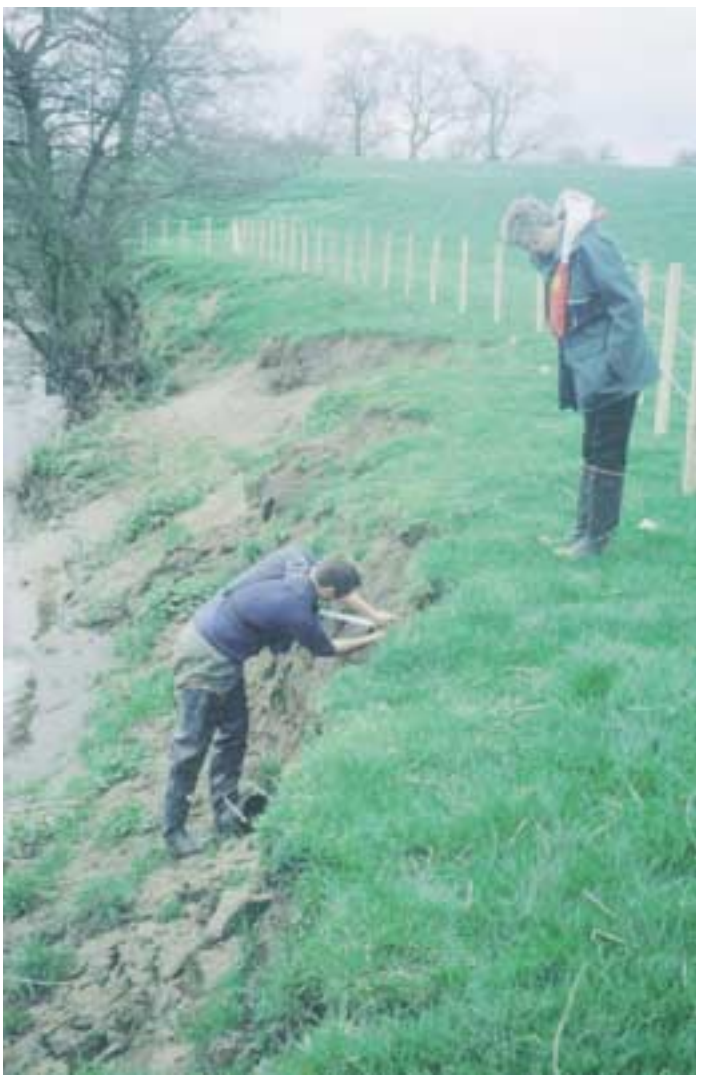
There has been great success in addressing the causes that give rise to many river management problems. Until the results of the monitoring are available it is difficult to determine what the tangible effects on the rivers has been of such advice and information, although we know 90km of river has been protected through fencing and buffer strips. An even greater achievement has been focussing grants (e.g. Woodland Grant Scheme and Countryside Stewardship) at the target catchments. This has ensured that over £1.5million of 'on the ground' environmental improvement (wildlife strips, fencing, ponds, species rich grassland) has been channelled into changing land-use on the target river catchments.

We are presently analysing the changes in land-use in each catchment that can be attributed to the project, and will soon be presenting this using GIS. We are also cataloguing the lessons learnt the hard way, that can be widely shared and hopefully not repeated.

The Future

The Sustainable Rivers Management Project is now entering its fourth year and will aim to maintain the success it has achieved so far. The results of the monitoring studies will help refine FWAG efforts to ensure the maximum amount of environmental benefit.

We also aim to work closely with the Rural Development Plan as it unfolds in the North West and dovetail the aims of the project with the overall plans for the NW rural community.



Monitoring has been intensive within the fenced Demonstration Areas

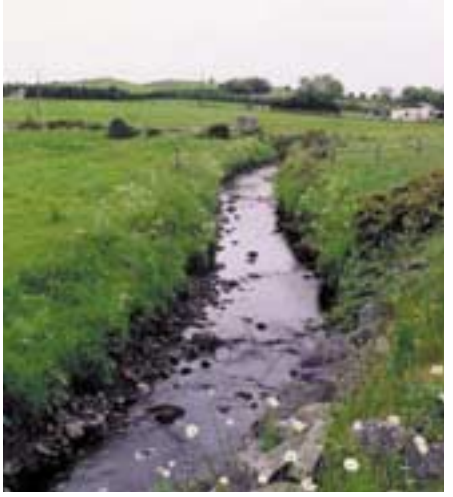
Salmonid Habitat Enhancement in Ireland

Dr Martin O'Grady tells us what he, and his colleagues, in the Central and Regional Fisheries Boards' have been doing to enhance Ireland's rivers

River restoration has been proceeding a pace in Ireland since the 1980's. The first major programme, carried out on the Boyne Catchment at a cost of £750,000, was designed to ameliorate the impacts of an arterial drainage scheme on atlantic salmon and brown trout stocks. Monitoring the effectiveness of these works taught us a very clear lesson - if the natural physical form of the river is restored and the banks securely fenced then the ecology of the channel, including its fish stocks, recover quickly.

Over the period 1995 to 1999 the Irish Government, with assistance from E.U. Structural Funds, invested significant monies in the rehabilitation of Ireland's salmonid rivers. A total of £12.5m has been spent over this period with the objective being an increase in tourism angling revenue. The strategy adopted in relation to the expenditure of these monies can be summarised as follows:

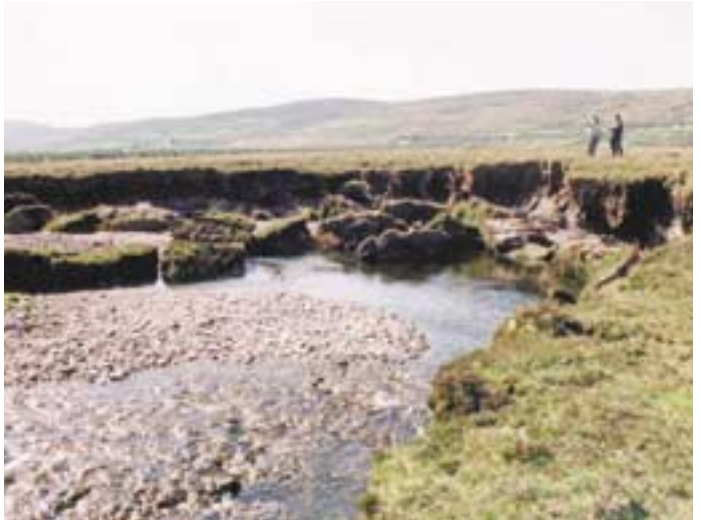
- Catchments which were targeted for works were surveyed in detail to establish the extent of imbalances on a catchment-wide basis.
- The likely gains in fish stocks were set against costs for each specific enhancement proposal. In this way the most cost-effective projects, in any one catchment, could be selected on an order of merit basis.
- It is crucial that the specific "bottlenecks" limiting stock production in any one catchment be identified and subsequently addressed. For example there is little point in improving salmon spawning areas if your baseline survey indicates that the lack of quality salmon parr water is the key factor limiting smolt production. Similarly the limited numbers of adult trout in a river might be related to the lack of quality pool areas rather than fry production levels. Each catchment will have a different suite of problems. A baseline survey is essential to identify the problem areas and, thereafter, address the key bottlenecks.



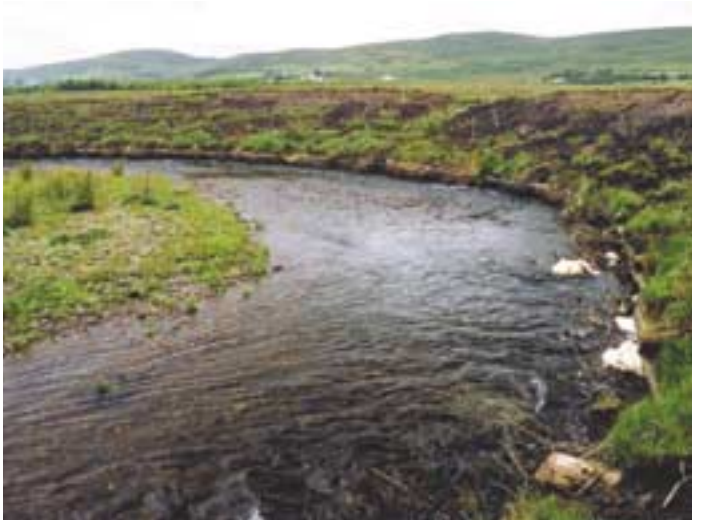
Arterial Drainage Damage

Baseline surveys of Irish catchments have identified the key problem areas - arterial drainage programmes, overgrazing, bank trampling and excessive deciduous bankside vegetation. Oddly enough all of these problems lead to the generation of the same suite of problems:- channels become excessively broad and shallow with the loss of a well-defined thalweg. Pool areas are either lost or reduced in quality. Spawning gravels become compacted. Biodiversity and biomass in relation to aquatic plants, macro-invertebrates and fish stocks (salmonid and non-salmonid) all decline. It was also apparent that most arterially drained channels, even 50 years after works, had not been able to re-establish their natural physical form and therefore had not recovered ecologically. It also became clear that once excessive bank erosion problems were in train a fencing programme alone was inadequate to restore stability.

Loss of marginal and bankside vegetation has been of great significance, since not only does this directly lead to lost habitat, it has increased channel instability, giving rise to whole-sale and unnatural bank erosion. A variety of techniques have been used to restore the natural physical form of disturbed channels. Most of these have been used widely in North America for many years. Wattling, a very successful bank stabilisation technique used in chalk streams in the south of England, has not been utilised. "Energy levels" in most Irish rivers are such that this technique will not provide sufficient bank stabilisation.



Over-active erosion of banks.
Eroding channel due to bank instability.



The same bank, 1 year after treatment.
Regrading and stabilisation using logs and conifer tops.

The Most Important Techniques

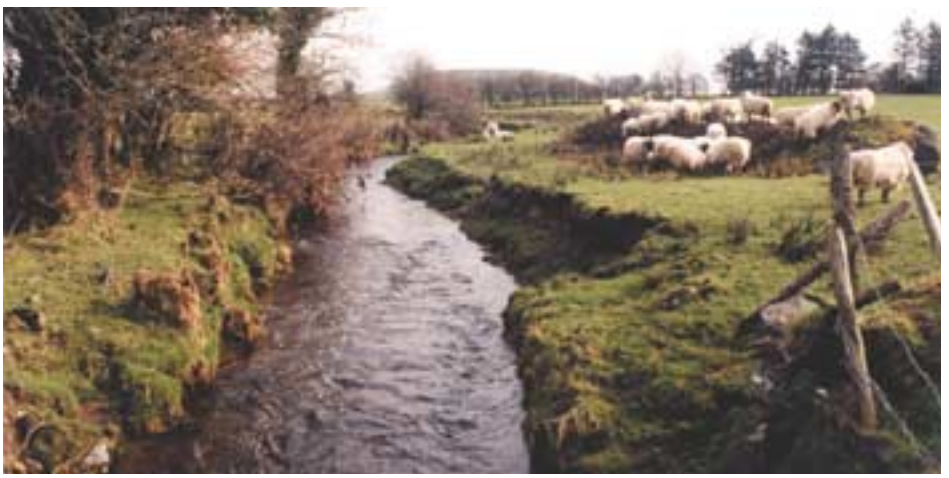
A small number of methodologies have been critically important in implementing the Salmon Habitat Enhancement programmes.

Installing vortex type stone weirs have proved to be very cost-effective, and they are extremely stable, even in high gradient channels (≤2.8%). These structures have been built in channels varying in width from 1-15m. The weirs are installed to restore the lost natural 'step-pool' sequences. The pool restoration is most important since they provide quality nursery areas for 1+ salmon and trout and resting/hiding places for returning adults. The stepped weirs not only sustain downstream pools, they alter the hydrology of a channel allowing gravel deposits to accumulate at the tail of pools, where fish can spawn.

Excessive bank erosion caused by trampling or overgrazing can be effectively treated by first addressing some of the causes of the problem, and then locally by helping the river recover from the impacts that effectively destroy channel form. Major erosion may require some realignment of the channel with a hydraulic machine, followed by the eroding bank being stabilised using a combination of logs and conifer tree tops as illustrated. Where space and circumstances are favourable, live wood can be used to establish some bankside tree cover for the future.

Fencing out stock has been a crucial element of all the programmes of river restoration in Ireland. Carrying out in-stream programmes is generally considered a waste of resources unless stock can be excluded.

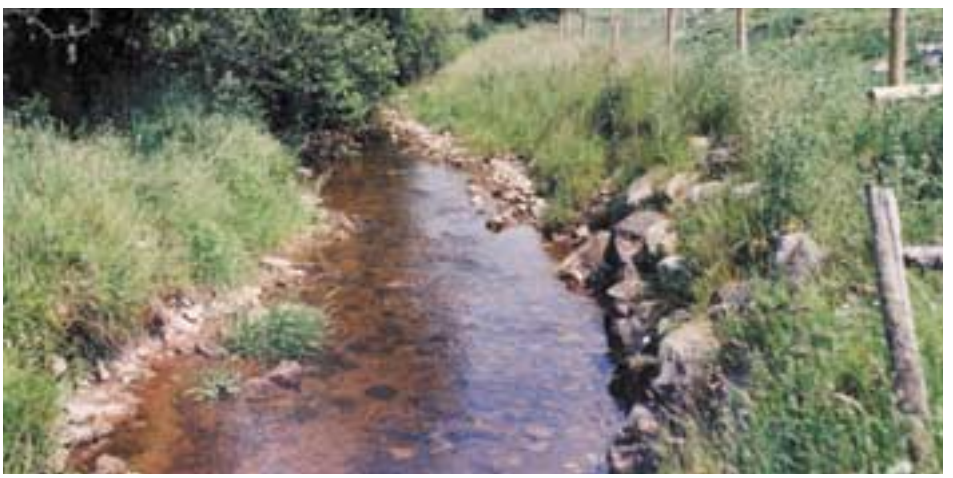
In Ireland a total of 2,000 kms of rivers and streams have been surveyed and 400 km of channel length have been rehabilitated over the period 1995 to 1999. The effectiveness of programmes have been monitored by quantifying changes in fish stocks in 200 'rehabilitated' and 200 adjacent 'control' reaches over a broad range of channels. Data indicate consistent increases in fish stocks in the rehabilitation reaches compared to adjacent control zones. How effective have programmes been? Well, this is almost like asking the proverbial question - how long is a piece of string! - gains in fish stocks in a particular channel, post-works, can be related to the extent to which the habitat had been disturbed in the first place. We are back to the baseline survey again!



Lack of marginal habitat due to trampling and over-grazing.

Charles Rangeley-Wilson, Martin O'Grady and Fergus Lynch.

In 2000 the work of the Central fisheries Board and the Shannon Fisheries Board was acknowledged by the Wild Trout Trust. Work undertaken on the tributary streams of Lough Ennell was awarded the WTS Conservation Award 2000 for a Professional entry. Presentation of the award was made at the Fly Fisher's Club in London. The award in the Amateur category went to Malcolm Cullen for the Walwyns Castle/Rickeston Stream Habitat Improvement Project in Pembrokeshire.



Fencing to allow natural recovery (the same bank 1 year later).

Wild Trout Trust – Annual Conservation Award

2001 will be the fourth year of the Wild Trout Trust Conservation Award. Previous years have attracted a wide range of exciting entries, from local community projects, angling clubs and river owners, to large-scale government sponsored works. We want to hear about any project no matter the scale, and there are prizes for professional and amateur entries.

Please send your entry (before and after photos, maps, an account of the work and its impact plus all other relevant details) to:

The Wild Trout Trust Conservation Award,
92-104 Carnwath Road, London SW63HW. ***Deadline 15th May***

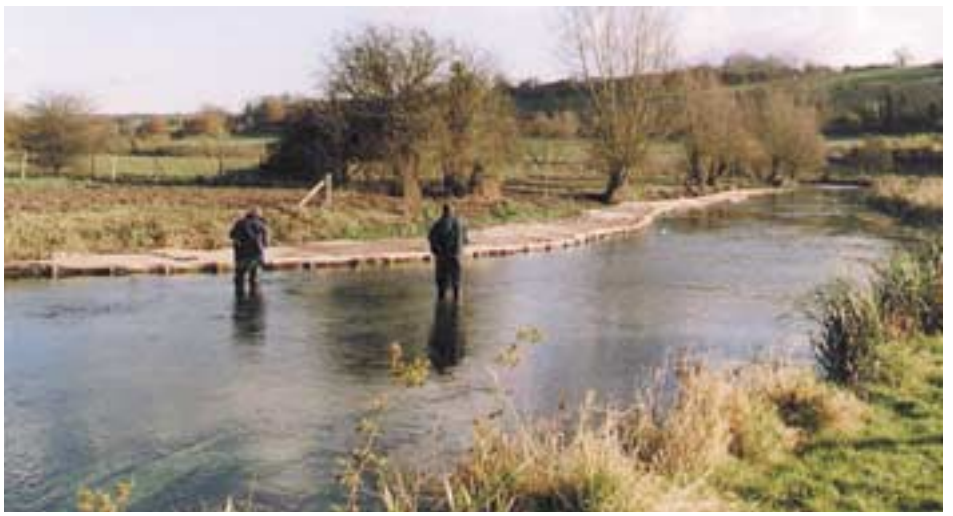
http://www.wildtrout.freeserve.co.uk/frontPage/DHTML.htm for further information

Feature Project: The Upper Kennet Rehabilitation Project, Wiltshire

Yvette de Garis, Mike Crafer and Nick Lutt at Thames Water review the trials and tribulations experienced in undertaking a five year project to rehabilitate the upper Kennet in Wiltshire.

Background

The project objective is to rehabilitate degraded sections of the upper Kennet within a 10km reach between Mildenhall and Knighton with a targeted set of enhancement measures. The river provides an interesting contrast in habitats with sections of pristine chalk river, characterised by swirling beds of Ranunculus (chalk stream water-crowfoot) and plentiful wild brown trout, interspersed with canal-like degraded reaches. Past management works ranging from mill impoundments to more recent dredging activities have resulted in over-widened, over-deepened stretches of channel that are prone to silt deposition with little, or no, Ranunculus. Repair of the degraded sections is a top priority for this important SSSI river, which is also valued as a fly fishery and community asset.



Demonstration site ledge – just completed

A key to the success of the project is that it is a public-private partnership, led by Thames Water, combined with the Environment Agency, English Nature, local pressure group (Action for the River Kennet) and local landowners. Together they share expertise to resolve a wide range of issues, including selecting sites for rehabilitation, design of project works, testing of experimental techniques, choosing appropriate monitoring programmes to demonstrate the benefits, and responding to the wettest autumn on record.

The project planned to implement works over a three year period, with an early demonstration project followed in subsequent years by other projects, the number and complexity of which being dependent on the selection process and available money.

Site selection

Interest from local landowners was high from the start of the project in January 1999, which resulted in there being more possible projects to implement than funds available. Therefore, all projects were assessed within a site selection matrix drawn up by the project partners against criteria including:

- contribution to improving characteristic ecology;
- visual restoration of chalk stream character;
- contribution to self-sustaining fishery;
- meeting implementation and consenting requirements.

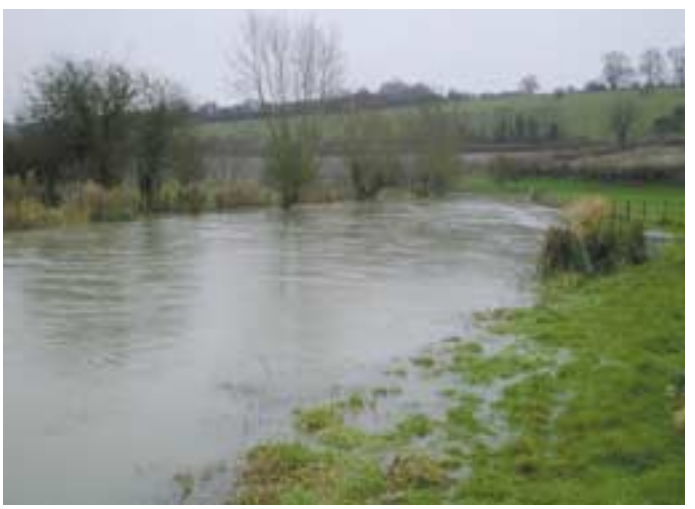
Prior to implementation each scheme was preceded by a feasibility study, topographic survey and hydraulic modelling to assess and refine the detailed designs. The pre-works assessments were essential to support applications for land drainage & SSSI consents and ensure sufficient protection was given to the habitats of protected species and there would be no increased risk of flooding.

Demonstration Project

Phase 1 of the project began in October 1999, with a variety of measures taken over a 340m reach of over-wide river near Mildenhall; a major component was the creation within the channel of a linear ledge forming a reed/sedge swamp. This was a demonstration phase to show neighbouring landowners examples of river rehabilitation techniques. Clean chalk gravel from an adjacent ditch was transferred to the margin of the river, the spoil being secured by a line of hazel faggots, and matting placed over the top, to prevent sediment wash-out to the river. The height of the ledge was set at mean-water level height, and the width to about one sixth of the channel width. This results in drought flows being restricted to a narrower width, and thus the river can sustain a clean gravel bed, but flood flows occupy the full width by flowing over the new swamp habitat. It will take several growing seasons for the reeds and sedges to become fully established.

Experimental techniques

The project also seeks practical experience in the use of experimental techniques. A Ranunculus re-establishment trial, using 'snow-shoes' (pliable hazel frames staked to the river bed) containing translocated plant material, on a reach near Axford where the plant disappeared during the 1989-92 drought, was very successful. Very good



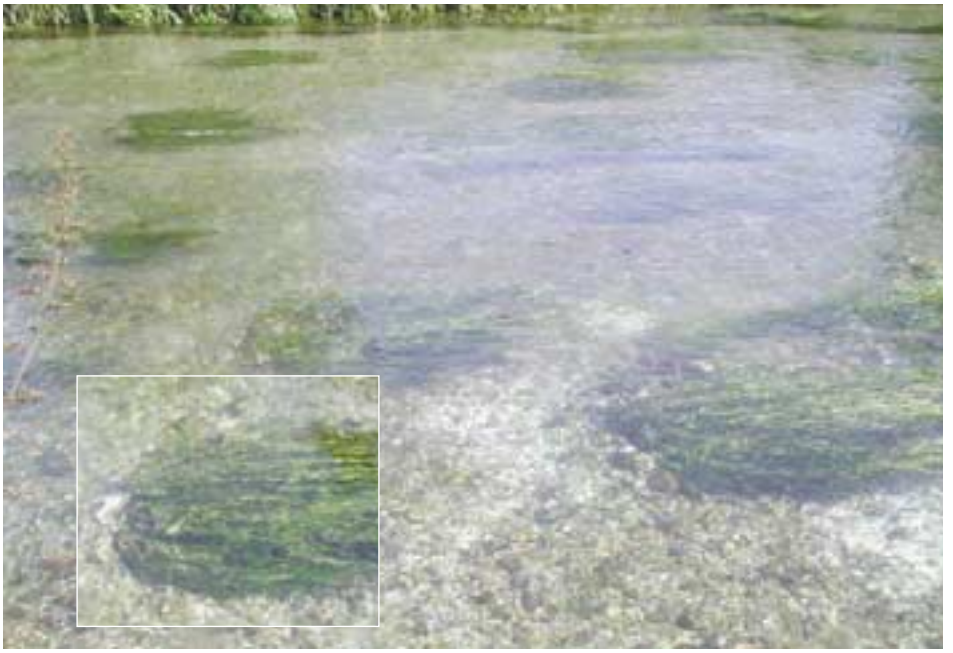
Demonstration site – submerged during high flows

establishment occurred except in the shallowest parts that were grazed by swans. This technique had been successfully used on the neighbouring Avon, and the technology transferred to the Kennet well. Another two tests using straw bales showed mixed responses: open straw bale deflectors lasted just a single season before they rotted; in contrast, local channel narrowing using buried straw bales for ballast was totally successful after the same period. Later this year, further trials with bales as ballast are planned.

Impact of the wettest year on record.

Phase 2 of the project began in October 2000 aiming to carry out works at three new sites. At one, 200 metres of over-widened side channel, with sluggish velocity and silt deposition, was re-configured by narrowing and shallowing works. Here the bed was raised by importing gravel from a constructed large pond in the adjacent floodplain. Deflectors were installed to encourage the natural extension of an existing sedge margin where machine access was not possible. The re-configured channel will restore typical chalk stream habitat, establishing a self cleansing gravel bed suitable for Ranunculus to establish and wild brown trout should again be able to breed here. Work was completed just before major floods occurred at the end of October. Unfortunately the exceptionally early break in springs made working conditions at the other two schemes too hazardous to complete and these will now be finished this autumn.

We are also now discussing with the project partners and local landowners the final projects to be completed as Phase 3 this autumn.



Show-shoes with planted Ranunculus

Baseline surveys

Monitoring of a range of biotic and abiotic factors has accompanied each scheme. As monitoring is expensive, the focus has been on those measures most likely to illustrate change from the pre-project baseline and effort has been concentrated on the Phase 1 scheme to enable the longest data record to be collected within the project time-scale. Macrophyte, fish, invertebrate, water level and velocity data are being collected together with a fixed-point photographic record. A particular issue during the construction of the Phase 1 works was the presence of water voles. Early consultation with English Nature modified the ledge design by incorporating an open water gap between the bank and the new ledge, to protect burrow entrances. Post works surveys indicate this has been successful with a healthy population of voles remaining. All Phase 2 and 3 projects will check for Desmoulin's Whorl snail, a BAP species inhabiting stands of reed and sedge. All monitoring results will be forwarded to the national RRC database.

Phase 2 – Asymmetric bed raising with chalk flints

Summary

- An early demonstration project proved an invaluable tool to explain the principles of river rehabilitation and types of materials used to landowners and the local community.
- The benefits of partnership working cannot be over stated - the multi-disciplinary nature of the project team allows issues to be raised and design modifications to be made at an early stage.
- A project aim of illustrating the benefit to private owners of improving 'their bit of river' and encouraging them to contribute costs towards this, has been achieved.
- A contingency plan to deal with wet autumns in the limited seasonal implementation window available is essential for anyone completing chalk stream rehabilitation. Early mobilisation of contractors is essential.

For more information about the project please contact: nick.lutt@thameswater.co.uk (0118 939 9118)

Joining the River Restoration Centre

If you are not a member of RRC, and wish to continue to receive the Newsletter, know more about the activities and outputs of the Centre, and also contribute to widening the Network of sharing experiences and knowledge, please contact us.

News and Events

New Faces at RRC:

RRC would like to welcome Judith Steele as the new Centre Administrator. Centre staff now comprises:
Martin Janes: Centre Manager
Karen Phillip: Information Officer
Judith Steele: Centre Administrator

Monitoring results of the River Cole- The Effects of River Restoration on Aquatic Diversity

Monitoring of the River Cole demonstration site, established by the RRC in 1994/5, has now reached its sixth year. Results of this work, which has been undertaken by The Ponds Conservation Trust: Policy & Research division and the University of Southampton, is reaching completion and will be reported on early this summer. A one-day meeting to review the results and visit the R. Cole site is being organised for early July 2001. For more information please contact Jeremy Biggs (jbiggs@brookes.ac.uk).

New River-Restoration mailbase

A River Restoration mailbase has been set up to act as a global forum for discussion, collaboration and communication between both practitioners and academics in the field of River Restoration. To join this mailbase contact Lydia Bruce-Burgess: L.Bruce-Burgess@qmw.ac.uk, Tel: 0207-8823363

An Evaluation of UK River Restoration Appraisal Procedures - results from a national survey'

Results of this national survey are now available in the form of an Interim R&D Report. Contact: L.Bruce-Burgess@qmw.ac.uk, Tel: 0207-8823363

Flood Defence and Agri-Environment Grants: Joint Application Possible?

MAFF have recognised that catchment planning for better flood defence will typically involve changes in land use that can deliver significant agri-environment benefits.

Delegates at the PARRETT CATCHMENT PROJECT conference on 5th February were addressed by ELLIOT MORLEY MP, the Minster for Fisheries and the Countryside who acknowledged this as an important theme of the project and promised his support. MAFF will be increasing expenditure on both flood defence and the agri-environment and can target both where mutual benefit is demonstrated.
This is excellent news for river restoration. It has long been recognised by those involved that the well being of our rivers depends on regenerating the natural functions of river floodplains if these have been isolated by land drainage works. Attenuation of flood peaks is one result of this and agri-environment improvements another. Funding of projects that deliver these joint benefits relies on MAFF grant that supports both but hitherto the rules that govern their application have been unsympathetic to efforts to bring them together.

If the Minister's comments are understood correctly we can look forward to the possibility that MAFF will actively seek the added value that can be realised by focusing flood defence and agri-environment grant more holistically.
Richard Vivash, Chairman RRC

Chairman of Somerset County Council, Humphrey Temperley with Elliot Morley, MP, at the launch of the Strategy for the Management of the Parrett Catchment, at the Royal Bath and West Showground.

The Parrett Catchment Project: Contact: Phil Stocks, Somerset County Council. Tel 01823 355455 Ext 5281: pmstocks@somerset.gov.uk or www.floodplains.org.uk.

FLOBAR Trying to sell floodplain woodland?

FLOBAR2 is an EU funded project which collects scientific data on the interactions between rivers, floodplain water tables and floodplain woodlands in a number of countries in Europe. We are also writing some documents on how floodplain woodlands function ecologically and the potential for restoring or rehabilitating floodplain woodlands in different European countries. We would be very interested to hear from anyone who has been involved in trying to establish woodlands on floodplains in the UK, in particular, difficulties gaining permission, legislative constraints and peoples' attitudes.

Francine Hughes - Department of Geography, University of Cambridge, Tel: 01223 330242. e-mail: fh13@cam.ac.uk.
www.geog.cam.ac.uk/research/FLOBAR2.htm

Mersey Basin Campaign receiving award.

Riverfestivel, Brisbane 2001

This annual event is Australia's largest river and water celebration, and includes the award of the riverprize which in 1999 was won by the Mersey Basin Campaign. Closing date for nominations is 20th April 2001. For more information see the River festival website.
www.riverfestival.com.au

Rivers Agency, Northern Ireland

The Rivers Agency have recently produced a manual on 'Sensitive River Maintenance'. For copies email Roger.Thompson@dardni.gov.uk

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.

Environment Agency · The Countryside Agency · English Nature · SEPA · Rivers Agency · Scottish Natural Heritage