



River Restoration NEWS

Issue 1
November 1998

NEWSLETTER of the RIVER RESTORATION CENTRE

Working to restore & enhance our rivers

Welcome to River Restoration News

River Restoration News is one of a series of information services, through which RRC aims to encourage the exchange of information on activities and initiatives relating to river restoration. Our focus is the UK, but contributors are welcome to draw attention to their international experiences.

The newsletter goes out to hundreds of individuals in scores of organisations; it is circulated to offices of national bodies such as the Environment Agency, Scottish Environmental Protection Agency, Rivers Agency, English Nature, Countryside Commission, Countryside Council for Wales and Scottish Natural Heritage. In addition

the newsletter is read by staff and volunteers in river trusts, water companies, NGOs, consultancies, local authorities, fishery associations & federations, professional institutions, universities and research institutes.

The newsletter will facilitate the exchange of information and promote debate. This is your newsletter, please contribute by giving your views on features, or issues raised, within the newsletter, or by submitting a short article. To submit articles or comments for publication in R. R. News please contact Martin Janes, RRC Centre Manager.

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Introducing the River Restoration Centre



River Skerne (Northumbrian Water/Air Fotos)

Established in April 1998, RRC is the successor to the River Restoration Project. RRC is uniquely committed to enabling practitioners and others to benefit from, and contribute to, the developing expertise and knowledge in river restoration.

A non-profit making company, limited by guarantee, RRC operates throughout England, N. Ireland, Scotland and Wales. The centre is managed by a Board of Directors and a Board of Management, comprising representatives of the statutory organisations actively supporting RRC. Martin Janes is the Centre Manager, based at Silsoe Campus. Nick Haycock is Chairman of the Board and Nigel Holmes is part-time Managing Director.

RRC funds its activities through a combination of statutory bodies, institutions, NGOs, researchers, businesses and individuals/societies etc. that have an interest in the benefits that rehabilitating our rivers can bring

RRC is establishing a national database on river restoration and rehabilitation activities in the UK, and the personnel and organisations participating in such work.

Subscribers to RRC will have access to an extensive network of information, impartial advice and contact with others who wish to promote or undertake river restoration. They will also receive this Newsletter and discounts on RRC publications, including a manual of restoration techniques and other reports or literature on river restoration. You will also be contributing to widening the network of those actively participating.

Individuals, or representatives of organisations, can join for as little as £50 / annum. For more information on the work of the Centre, and what it can do for you, please contact Martin Janes.

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NORTHERN IRELAND

Roger Thompson, Environmental Manager of the Rivers Agency (formerly Watercourse Management Division) reports.

The Agency “is delighted to have been associated with, and provide financial support to, RRP, and more recently the RRC, since 1993. The Agency’s main statutory responsibilities, and past experience, concentrate on river engineering practices for flood defence and land drainage. The recent changes in working practices reflect a new ‘environmental dimension’ to the Agency’s activities which recognise the value and importance of river restoration which endorse the objectives of RRC.

Due to the nature of the Agency’s core business it cannot undertake large scale river restoration projects without partnerships. However it can utilize the techniques and experiences

of restoration in maintenance operations and water recreation schemes to bring environmental improvements on the back of routine activities. Numerous opportunities have been taken for small scale river habitat enhancements, fisheries rehabilitation and wetland recreation. In addition, two ‘mini’ restoration schemes have been carried out in recent years on the Tall and Ballysallagh Blagh”.

Some information on work carried out on these rivers will be given in future Newsletters. In the meantime the Agency is keen to identify other potential river restoration sites, particularly in urban areas. It is also planning, with the aid of RRC, training workshops for key personnel who will be responsible for implementation of such works in the future.

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SCOTLAND

When WWF launched their Wild Rivers Project in 1995 they highlighted that, despite an air of superficial health, many of Scotland’s rivers are severely degraded. They organised a seminar (see Events) in June which coincided with the publication of an excellent draft discussion paper ‘A

Scottish Rivers Programme’ which argues the case for an integrated programme of sound river management that combines incentives, policies and guidance. Meanwhile their first wild rivers demonstration has been launched on the West Water.

The Tweed Foundation, set up in 1983, has undertaken many fishery habitat enhancements and researched and monitored the effects over the last 10 years. Some very impressive habitat recovery has resulted from fencing heavily over-grazed rivers. The foundation is currently implementing a Habitat Enhancement Programme supported by EU Objective 5b funds.

SEPA is also advancing its Habitat Enhancement Initiative. This project aims to help SEPA, in conjunction with external partners, secure measurable improvements in the way in which natural habitats are managed, with enhancement of conservation and biodiversity interests in aquatic and riparian habitats. Activities and outputs will be varied, with Best Practice Guidelines on Urban River Engineering, Aquatic Conservation and Engineering, and Fisheries Habitat Improvement planned. RRC supports their programme of work through SEPA funds. There will be more information on all the above in future Newsletters, and from Andrew Wallace, the Salmon Fisheries Co-ordinator.



R. Spey. A future issue will look at floodplain forests. (RRC).

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ENGLAND

The centre pages of this newsletter highlight the major role that the Environment Agency plays in river restoration. The scheme at Horncastle also shows that local authorities are taking an active role, in partnership with the Heritage Lottery Fund, consulting engineers, landscape architects and specialist contractors.

There are also many urban river valley initiatives based on consortia working together to improve local river environments. North West Region of the Environment Agency is looking to increase the knowledge and understanding of how catchment

land-use and practices influence river quality and function. Their Sustainable Rivers Project and ‘Natural Assets Register for the Sankey Catchment’ are tangible examples of how an understanding of the changing ecological and geomorphological qualities of an entire catchment is the most appropriate way to plan for both local and strategic ecosystem enhancement. Increasingly, information from River Habitat Surveys will be utilized to target areas for rehabilitation, within the framework of a better understanding of the over-all resources in the catchment.

WALES

The recent restoration project on the Afon Ogwen is a pioneering example on a high energy, low sediment transport, mountain river. In early 1997 RRC was invited to develop a partnership between The National Trust, Countryside Council for Wales and the Environment Agency to promote a restoration project on the river. The reach is within Snowdonia National Park and is part of the Glydeiriau SSSI. The whole reach can be viewed from the A5, north of Llyn Ogwen.



Ogwen before. (RRC).

RRC developed with the partners a vision document for the valley encompassing the river and floodplain habitats of which farming is a key interest. The result of the exercise was that three critical river reaches within a four kilometre section of the river were brought into focus. These reaches had been dramatically changed in the 1960's as part of a general program of works designed to improve the drainage of the farmland within the valley. Boulder riffles, cascades, fords and stepping stone obstacles had been removed from the river and used

Here the river bed was raised by 1½m with a gradient of 1 in 100. Stepping stones restored in the foreground. (RRC).



to create levees. Afon Ogwen thus resembled a land drainage channel not the Welsh river it once was, and the natural hydrological and geomorphological regime of the river had not shown any indication of being able to repair itself from the degradations.

With the Agency as principal funders, the first phase of work was started in the summer of 1998. A 900m reach downstream of Rhaeadr Ogwen (Ogwen Falls) was targeted since the river was down-cutting into the floodplain sediments and banks were showing evidence of accelerated erosion. From historical data the location of boulder riffles, cascades, steeping stones, islands and fords were integrated into the restoration work plan. Previously dredged debris on the river banks was sorted and carefully restored to the river to raise bed level by an average of 1m (up to 2m in places) bringing the river back to life. To date no external material has been used in the project. In some small areas locally sourced willow has been used to create revetments but on the whole the historic banks of the river have been exposed with careful excavation. The works on the river have been integrated into a larger plan of floodplain habitat management. Countryside Council for Wales have come to agreements with tenants on the position of fencing relative to the river, hill slope drainage ditches, woodland regeneration and limiting stock access to the river banks.

This first phase of works will hopefully lead to the restoration of the other two critical reaches along Afon Ogwen. Local farmers have been central to the success of the first phase and there are local plans to develop an interpretative centre on the river and its valley in association with the National Trust and the Environment Agency.

Visitors to the river are reminded that there is limited public access - contact the National Trust. Tel: 01690 710678.

Prior to promoting phases 2 and 3, the Agency hopes to produce a leaflet describing phase 1 (contact: Brian Jones - 01248 670770).

EA Thames Enhancement Projects Audited

The Environment Agency (Thames Region) has for many years promoted nature conservation through its Flood Defence Committee, redressing some of the adverse legacies of past schemes. In doing so it collaborates with other Agency functions and external organisations.

This year a series of 'audits' were undertaken, by RRC, of projects carried out primarily since 1989 mostly through the Thames Region's Flood Defence Enhancement Programme, as well as those promoted through fisheries, conservation and landscape architects sections. Twenty projects from small enhancements to more complex restoration schemes were chosen which demonstrate examples of best-practice, innovation and design improvements within river management. The audits give an independent review of some of the region's extensive array of rehabilitation schemes, and enable RRC to extend its database on the technical and practical aspects of such work.

Accompanied site visits were made for all projects following consultation and information gathering with the key staff involved. These visits enabled the scope of works, and subsequent development since completion, to be seen and assessed against objectives. This information formed the basis of RRC's 'audits'

flow is concentrated sufficiently to create and sustain habitat diversity.

- Successful placement of self-cleaning gravel riffles is highly dependent on sediment sizing and riffle design (e.g., size, shape, gradient, etc).
- It is impossible to be totally accurate in setting the height of berms – common sense and calculations of water levels need to be used together.
- River narrowing can be achieved, whilst retaining flood capacity, by in-filling part of the low-flow width with material from the bank slopes.
- On-site expertise is invaluable – part art



Tidal Crane. Use of different materials to enhance the reach. Incorporating raised ledges and retaining mature trees. (RRC).

which were presented as a series of short reports containing the following:

- General/catchment information;
- Background;
- Objectives;
- Works carried out;
- Success/lessons;
- Overall conclusion;
- Recommendations for the site;
- Recommendations/considerations for future application;
- Costs;
- Available information;
- Key personnel.

Some lessons learnt from these 'audits' are summarised below. These may help other practitioners plan restoration projects and ensure that data are collected before, during and after implementation of future schemes in such a way as to extend the pool of knowledge and experience of river restoration techniques.

CHANNEL DESIGN

- Design of groynes/deflectors is critical to avoid creating new bank erosion problems and ensure that, in low-flow conditions,



River Dun at Froxfield. Channel narrowing from 20m to 5m using blockstone, hazel hurdles; retaining a backwater. (RRC).

and part science – and must be able to adapt to on-site conditions – costs incurred through additional supervision are usually justified by the end result.

could accrue from capital investment in restoration projects needs to take account of how these will be dependent on future management of the site.

INTEGRATED DESIGN PLANNING

- Fishery, ecology and landscape interests must be integrated in all schemes at the start of the planning process, not as 'late entry add-ons.'
- Ecological benefits should not be overshadowed by lack of consideration and effort in landscape design, e.g., by unnecessary, unsightly engineering structures.
- Assessing the potential benefits that

MATERIAL SELECTION

- Non-degradable geo-textiles may be over-kill where only initial edge stability is needed in advance of vegetation growth and earth stabilisation – far better to use bio-degradable materials.
- Geotextile (Nicospan) can be an effective alternative to sheet piling, and is suitable for holding soft silt in place where back-fill is very fine.
- Planted coir rolls provide a very effective 'soft face' habitat in

association with low-level piling/bag work required for additional strength.

- Berms retained by hurdles, faggots and spiling are unsightly if well above water level, especially if back-fill settles. The temporary use and removal of such materials, when the back-fill has consolidated, may be appropriate.

VEGETATION

ESTABLISHMENT

- Vegetation growth is an essential ingredient in successful channel narrowing, both for sustainable natural habitat creation/recovery and visual amenity. The design should plan to allow plant growth to determine the width of the low-flow channel, commensurate with flow character.
- Where wide impounded reaches are rehabilitated by removing downstream control structures, channel narrowing often occurs naturally over time, without the need of expensive and interventionist engineering.
- In over-deepened, over-wide channels with little marginal habitat, vegetation growth can begin the processes of wet ledge development and narrowing through simple re-profiling of the banks.
- Visual impact of bank reinforcements,



R. Thames at London Yard, Isle of Dogs. Beach creation with defenses set back from the usual bankline. (RRC).

e.g., faggots or hurdles, can be reduced by back-filling with reeds, turf or seeded topsoil.

- If plant plugs are to be successfully established on banks, timing and after-care maintenance is essential.
- Tree planting as part of, or after, a scheme must take into account shading and future management implications.

MONITORING

- Scheme objectives must be clearly documented prior to construction to facilitate useful auditing.
- Pre-scheme surveys and photographs are invaluable for future reference.
- Long-term monitoring is needed at many sites to determine if the objectives of restoration are achieved and to establish the time-scale of change.
- Simple monitoring by regular photography can show the rate of vegetation establishment and changes to longevity of measures introduced for rehabilitation.
- Good photographic and technical specifications of all projects are essential if they are to give confidence to others and be replicated in future schemes.
- After-care monitoring, and the provision of resources to undertake minor modifications and enhancements, can provide better value for money than new works.
- Advances in setting up and assessing the results of monitoring programmes for biota (especially fish) are needed if the benefits of restoration are to be identified in a more quantifiable way.



Bear Brook at Aylesbury. Sometimes poor choice of materials and location of fencing can detract from an otherwise successful scheme. (RRC).

The observations outlined in this summary are a selection of assessments made in the reports to the Environment Agency Thames Region. They are by no means comprehensive and many valuable lessons can be learnt from other schemes. If you have views or experiences that you wish to share, please contact River Restoration News. For more information about the Thames Audits, or the independent project evaluation service that RRC can provide to support your activities, please contact Martin Janes, RRC Centre Manager.

The Bain at Horncastle

David Holland, of Land Wood and Water, reports on a local authority led river restoration scheme where landscape quality, habitat enhancement and public amenity improvements were achieved without detriment to flood defence standards and within a typically constrained urban environment. The promoters, East Lindsey District Council (ELDC), encouraged an environmentally-led project where designs were developed by landscape architect Eoghan Shiels in consultation with statutory and other interested organisations. Environmental needs led the scheme design with engineering expertise used to resolve specific technical issues.

The Problem

The transformed 200m of River Bain in the centre of Horncastle previously suffered problems typical of so many urban rivers. The historic floodplain was lost to supermarket development and parking, and the character of the river changed by the construction of a weir and regular ‘municipal-style’ management. Banks were eroded, uniform and well tended, whilst the straight ponded channel had a bed composed solely of silt. With access to water denied by the steep banks, the river had neither aesthetic appeal nor ecological value. To make matters worse, long periods of low flow accentuated the problems of uniformity.

PROJECT AIMS

The project aimed to improve the river in three main ways:

- improve public access to, and awareness of, the river;
- increase ecological value;
- provide conditions to maximise the visual and geomorphological benefits of existing flows.



Before; eroding steep banks with little aesthetic appeal. (ELDC).

The Solution

The initial process required the development of a strategy which would link visual and ecological enhancements with improved public access to the river. As in so many urban environments, rehabilitation

here had to be confined to the river channel and its immediate corridor as development precluded any floodplain restoration. Channel narrowing would concentrate low flows to reduce siltation and maximise the visual and sound effects of the water. A series of terraces would allow public access to the immediate water's edge and provide

adjacent picnic areas whilst re-profiled banks could be landscaped and planted with trees and shrubs to establish a sense of naturalness between river and development.

Cut and fill works resulted in a totally rebuilt river environment, featuring a series of riffle and pool sequences alongside large low ledges planted with colourful native marginal plants, higher terraces used extensively by the public, and attractive planted banks replacing the previous unsightly and eroding ones. A feature of the restored site is the intricate variation of shapes, sizes and configurations of the created ledges and terraces. Because of the ‘flashy’ nature of the river, various bio-degradable erosion control nets and blankets were used to prevent the ledges being washed away before the extensive range of wetland plants had become established and consolidated the fill. Many of these plants were introduced in commercially available coir logs and pallets which provide ideal establishment conditions and also reduce erosion impacts. The terraces are held in place by feature timber retaining walls which allow safe access right to the water's edge. Imported stone to help create and sustain the riffles immediately diversified the bed character and provided new habitats for numerous invertebrates and spawning areas for fish.



Planted coir rolls and coir netting used to establish ledge vegetation. (Martin Jones).

The Partnership

The promotion of the scheme by ELDC was supported by the Environment Agency. Funding came from the Heritage Lottery Fund, English Heritage, European Regional Development Fund, Rural Development Commission, Lincolnshire County Council and ELDC. RRC subscribers Land, Wood and Water were appointed as contractors, selected because of their practical expertise of implementing such projects. Through advice on details of materials to use, and the preferred construction process, they played a key part in the partnership of engineers, landscape architects and quantity surveyors in making the project a success. The total cost of the river works and associated landscaping, was £100k. They were linked to other works in the vicinity, including weir re-building, which totalled £300k.

Feedback

The work has only been recently completed, opened officially in July 1998, the occasion marked by holding a Duck Race. Robert Walker, ELDC's Principal Conservation Officer reports that the scheme has virtually become a victim of its own success. "The site has changed dramatically, with the river now looking and sounding alive.

It attracts river dippers, picnickers, bikers and anglers in great numbers, with there now being a need to consider methods of restricting areas for some users. The river has become a Mecca for anglers from far and wide, with visitors treated to watching Chub and Dace spawning on the riffles. Councillors have visited the site and been impressed by the transformation that has taken place, so much so that the success has promoted actions to consider other river restoration projects within the District".



After; a successful urban project showing what can be achieved through careful design and partnership. (ELDC).

RRC's Research Coordinator

The Research Co-ordinator post has been established to provide a UK focus for keeping abreast of world-wide information on research activities relevant to river restoration and rehabilitation, and to identify research needs and available funding.

An international network is being established of people interested in all aspects of research into river restoration - environmental, social and economic. A detailed questionnaire has been issued to the people currently on the network to identify the specific aims and objectives of contemporary research projects. Continual use of the Internet reveals groups and individuals working within the sphere of river restoration/rehabilitation world-wide, which are then targeted for information.

The information gathered becomes part of the Research Directories, which follow a similar format to the RRC's Projects Database. The flexibility of the directories allows information to be easily collated, categorised and cross referenced, facilitating the integration of research information with the technical aspects of practical work. Trends in river restoration research will be analysed and monitored, to define complementary programmes and recognise significant duplication or gaps in current work.

The long term goal is to identify funding opportunities and link them with new research programmes, particularly in areas currently under studied, and to act in a facilitating role, helping users of the Centre sort out their research needs.

A preliminary conclusion from initial results of the trawl is that there is a broad spectrum of research being undertaken, ranging from site specific monitoring and post project appraisal, to catchment (watershed) management. Much time and effort is being put in to the development of design guidance manuals/handbooks, as it is felt there is little guidance available on the implementation of new techniques in river restoration.

In the United States there is a move toward management of common resources e.g. fish, forests, streams etc. on a catchment basis, rather than by separate departments and agencies. In Massachusetts and elsewhere it is necessary for substantial popular participation in the planning and implementing of catchment projects and programmes, with a Basin Team being made up of representatives from state and federal agencies as well as community groups.

Extensive research work of relevance to river restoration is being carried out in Universities, by Government bodies and independent organisations in the UK and overseas. If you would like to become part of the research network, and have the opportunity to submit and share information, then please contact:

Brenda McEvoy, RRC Research Co-ordinator, FHRC,
Queensway, Enfield, Middlesex EN3 4SF. b.mcevoy@mdx.ac.uk

Events

This part of the Newsletter is intended to enable readers to inform each other of important forthcoming Events, report on past events, be advised of new publications, or provide feed-back on ones they have recently come across. **You are also invited to stimulate debate on topical or burning issues related to river restoration.**

EVENTS

Northern Britain has had its fair share of special river restoration events this summer: *The Wild Rivers Seminar* hosted by WWF Scotland on June 12th brought together a diverse range of individuals and organisations to discuss rivers and river management. In respect to changing traditional attitudes to river management, a view expressed by a Scottish landowner was most pertinent - 'evolution, not revolution' is the way forward. There was also positive feedback from the Scottish Office to a suggestion that an official conference on rivers in relation to the Water Framework Directive would be useful. Hopefully news of such an event will reach you on this page in future Issues.

As one project had its concluding ceremony in North-east England another one was launched. *RRP's EU-Life Demonstration Project on the R. Skerne* was officially concluded in July by a morning seminar in Darlington followed by a riverside ceremony on the banks of the river. Project partners from throughout the UK were there to celebrate a great achievement of transforming a short stretch of previously degraded and uninspiring urban river. They were joined by many local people and distinguished guests from Denmark. A bit further north a project of a very different nature was advancing well. The *Northumbrian Rivers Project*, aims 'to deliver an integrated package of advice, training and finance to enable landowners, managers and users to implement the best available river corridor management techniques and develop a co-ordinated approach to the sympathetic marketing of rivers for sustainable economic gain'. We will be reporting on progress on this project, and several similar ones where FWAG frequently play



Skerne completion ceremony. (RRC).

a vital role in helping resolve potential conflicts of interests, in future issues.

Following on from the successful *Lowland River Restoration Conference* in Denmark in summer 1996, there is likely to be another European Conference in Holland held on 15th-19th May 2000. A three day seminar in September of the same year is also being planned by the Wild Trout Society entitled 'The Implementation of Coldwater Ecosystem Rehabilitation Science'.

FUTURE FEATURES:

- Ettrick floodplain forest.
- Sustainable catchment management.
- Land-use change projects.
- RRC's project database.
- The role of fisheries in river restoration.
- 'Soft engineering' resoration of Chalk streams.
- The European Centre for River Restoration (ECRR).

FEEDBACK:

RRC would appreciate feedback on this Newsletter and also invite you to contribute to it. Please contact Martin Janes at the Centre if you have ideas for future editions or wish to contribute either short comments or a feature. If you feel that the Newsletter would be read and appreciated by others, to whom it is not currently circulated, please let us know

FURTHER INFORMATION:

Please contact the centre for more information on:

- Membership of RRC.
- Manual of River Restoration Techniques.
- Publications.
- Rivers of the Future; a 30 minute film

This edition of River Restoration News has been edited, on behalf of RRC, by Brian Smith, Project Manager, Medway River Project.

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