



River Restoration NEWS

Issue 3
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NEWSLETTER of the RIVER RESTORATION CENTRE

Working to restore & enhance our rivers

Skerne Life Project Wins Civic Trust Award

The River Skerne Restoration Project in Darlington, one of two UK restoration projects developed by the River Restoration Project, was the winner of the Civic Trust's Special Award for Landscape. Chris Spray, as Chairman of the Project Board, accepted the award on behalf of the Project partners and the people of Darlington at the awards ceremony at The Banqueting House, Whitehall, London, in March.

Civic Trust Awards are given to projects throughout the UK that reach the highest standards in both their design and their contribution to the environment or community. Just under 500 projects were entered in 1999, 19 of which received awards, eight in the 'Special' category.



Chris Spray (Chairman), and the Project Board, receiving the Skerne award.

RRC In Conference

RRC has been involved with several conferences in the past three months. Three which attracted national interest were the RSPB's **Silver-meadows - do they have a future?** conference in London, SEPA's **Habitat Enhancement Initiative** (HEI) conference and CIWEM's 50th Anniversary meeting of its Rivers and Coastal Group. Presentations were made by Nigel Holmes at both SEPA's (see page 2) and CIWEM's conferences.

Silver-meadows - RRC was delighted to be invited to this conference where the Rt. Hon. Elliot Morley, Minister for the Countryside, gave the keynote speech. The BBC political correspondent, Robin Oakley, chaired a good

humoured and lively debate where there was strong support for 'joined-up thinking' to furthering partnerships that improve co-ordination and integration of linked activities and interests.

Following the conference, Nigel Holmes, RRC Managing Director, wrote to the Minister stating that "RRC obviously promotes river and floodplain restoration as a multi-interest activity which can help government achieve biodiversity responsibilities as well as bring about more sustainable and cost-effective flood risk management and water quality improvements.... The conference posed the question: Silver Meadows - do they have a

future? If this future is to be sustainable, they will need to return to river floodplains where they will once again perform flood protection roles to the benefit of the catchment, and UK, as a whole. For this to happen, MAFF will need to take the lead in forging improved inter-sector and inter-departmental 'joined-up' action. RRC is keen to help, and looks forward to assisting you and others bring about the changes so clearly thought necessary by the conference delegates"

RRC Supported Initiatives

The Centre is currently involved in various ways in several different projects. These include:

- Phase II of the Afon Ogwen, North Wales, carrying on from the well received first stage reported on in Issue 1;
- aiding Clackmannan-shire Council to promote positive integrated management of the Devon and Black Devon catchments;
- working with London Borough of Brent

to implement a large urban rehabilitation scheme on the River Brent, Wembley;

- advising Caradon D.C. on the options available for wetland creation and restoration work on the wooded River Seaton;
- working with the National Trust on Looe Pool in Cornwall;
- and on North Yorkshire's River Wharfe, continuing RRC's involvement in the Upper Wharfedale 'Best Practice' Project.

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Due to the number of features submitted for publication, News in this issue will focus on Scotland

SCOTLAND

Interest in river restoration has increased greatly in recent years in Scotland, and RRC is providing assistance to a variety of initiatives through funding support from the Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH) and other subscribers. SEPA held its **Habitat Enhancement Initiative (HEI) conference** in Glasgow on the 12th of April to promote greater awareness of the initiative. Following the SEPA Conference, RRC participated in discussions with WWF, SEPA, SNH and Scottish Wildlife Trust to explore ideas on how the Centre could best provide assistance to these organisations.



WWF Demonstration Site

The **WWF Wild Rivers**

demonstration site on West Water at Blairno, includes a number of rehabilitation measures which have been undertaken on a scale that can be used to encourage adoption by many landowners in Scotland, and demonstrate the potential for combining agriculture and conservation to mutual benefit. Examples include diversion of a ditch into the floodplain to create wetland habitat and improve water quality, extensive stock and rabbit fencing to encourage natural regeneration, and floodplain tree planting. There is considerable monitoring underway to show what improvements occur, which habitats and species benefit most, how rapidly recovery takes place, and background process monitoring on geomorphology.

The **Devon and Black Devon Catchment Initiative**, promoted by WWF and United Distillers, has led to discussions between RRC and Clackmannanshire Council to promote positive integrated management of the catchments. The primary focus of the project is clarifying and understanding the flood risks so that development and nature protection can be promoted through positive management, including natural management solutions to address flood alleviation. As a result, there should be appropriate developments within the catchment combined with enhanced wildlife value and improved public enjoyment and awareness of these rivers and adjacent landscapes. It is hoped that the project can be used as a 'blue-print' to be adopted and developed for other catchments and Councils in Scotland.

SEPA's HABITAT ENHANCEMENT INITIATIVE - Katherine Bradshaw, Project Manager

Feedback following the Habitat Enhancement conference, run by SEPA, the Consortium of Scottish Local Authorities (COSLA), and Glasgow City Council, in April confirmed the event was well received. The audience was mainly local authority planners and engineers who indicated that their working practices would be likely to change as a result of their attendance.

Responses to the consultation report '*A Living River by the Door*' are being collated. This report aims to raise awareness to Urban River Engineering good practice. Reactions to the report to date have been largely positive, again especially from the Scottish Local Authorities.

The first draft of another HEI output, the Pond Protection and Design best practise guidance notes has also been produced, and the HEI umbrella 'Natural Heritage Handbook' for SEPA staff has also been produced to increase internal awareness. Each contains a copy of the RRC Manual of River Restoration Techniques - collectively these have been well received and are helping staff to promote good practice as part of SEPA's routine business.

The HEI project will be supporting the development of suitable best practise demonstration sites throughout Scotland with a programme of related training proposed from July 1999 onwards.



Natural adjustment of managed channel

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.

BALLYSALLY BLAGH

FLOOD ALLEVIATION AND RESTORATION PROJECT - 1994/5

The Ballysally Blagh scheme was the first flood protection scheme in N. Ireland designed with river restoration as a key and integral aim of the project. It was undertaken by the Watercourse Management Division of the Department of Agriculture (NI), now the Rivers Agency. While the works upstream of the University were contracted out, the section through the University grounds was undertaken by the Direct Labour Organisation. Works were completed in 1996. In February RRC undertook an audit of the scheme, and here we report briefly on some aspects of the project. The works have been also been the subject of a PhD study - results of this we will bring you in future editions.

The Ballysally Blagh in Coleraine is an urban tributary of the Lower River Bann. The stream is approximately 2-4m wide and in places flows through a heavily engineered channel with rock armouring. The upper section of the 1.25 km stretch that is subject to the works, flows through a thin corridor bordered by housing (gardens), which then opens out into the landscaped grounds of the University of Ulster. Due to a high agricultural sediment load, the bed is dominated by silt which overlays gravel, clay and rock.

Background - In the 1980s several flood events caused property damage to houses and developments built on the floodplain since the 1950s. To achieve the required flood protection, channel re-grading and/or widening was deemed necessary. This would be achieved through bed lowering of 500-750 mm and widening by 1-1.5m. Through the University grounds, flood risk was minimal, so the design team promoted a series of channel enhancements to be carried out as part of the completed flood alleviation project.

Objectives -

- Flood alleviation of the surrounding catchment area;
- Improved visual appearance by reinstating channel features lost during previous drainage works;
- Enhanced wildlife, fishery and conservation value;
- Develop enhancement/restoration skills of the in-house workforce;
- Act as a pilot for other sites to promote a more environmentally sympathetic approach.

Works carried out - In addition to substantial channel deepening, widening and associated bank stabilisation works, a number of mitigation measures were undertaken in the developed corridor (to reduce the impact of heavy engineering) and within the University grounds enhancement works were carried out.

Mitigation works -

- Low level wet berms
- Randomly placed stone blocks
- Bird nesting tunnels
- Willow stakes in gabions
- Tree and shrub planting
- Flow deflectors/groynes

Enhancement works -

- Deflector groynes
- Bank re-profiling and small ledges
- Low rock fish weirs and gravel
- Two large 'meanders'
- Off line bay
- Island creation and tree planting

Successes and lessons:

Developed Corridor - The willow stakes inserted into the gabion baskets grew exceptionally well given that some are up to 2m above the water level. They have created a very good landscape feature, and wildlife habitat, and have required some management to ensure they



Ballysally Blagh project site

do not cause stability problems leading to collapse or splitting of the baskets.

As a result of the general widening of the stream and the introduction of groynes, boulders, and emergent plants, silt is being deposited and stabilising to form additional berms, creating a sinuous low flow channel. The visual effect of this narrowing helps to break up the otherwise monotonously straight and constrained course created years ago.

University Grounds - The two large 'meanders' were created to add sinuosity to the reach. However the meanders were too long compared to the width of the channel and the arc of curvature too shallow to be sustained; the stream has since produced a much tighter, narrower and more sinuous course within the engineered channel. Owing to the sediment regime of the stream, their location, the shape of the bank cut, and the planting carried out, the small ledges created by re-profiling the bank have accreted a large amount of silt (up to 40 cm).

The small bay, created as part of the enhancement works, suffered from heavy siltation within the first year. Currently the bay is dry for most of the year, only holding rainwater or floodwater behind a silt bar that has developed across the bay. Some erosion at both ends of the island has occurred but vegetation growth is stabilising the process and creating habitat.

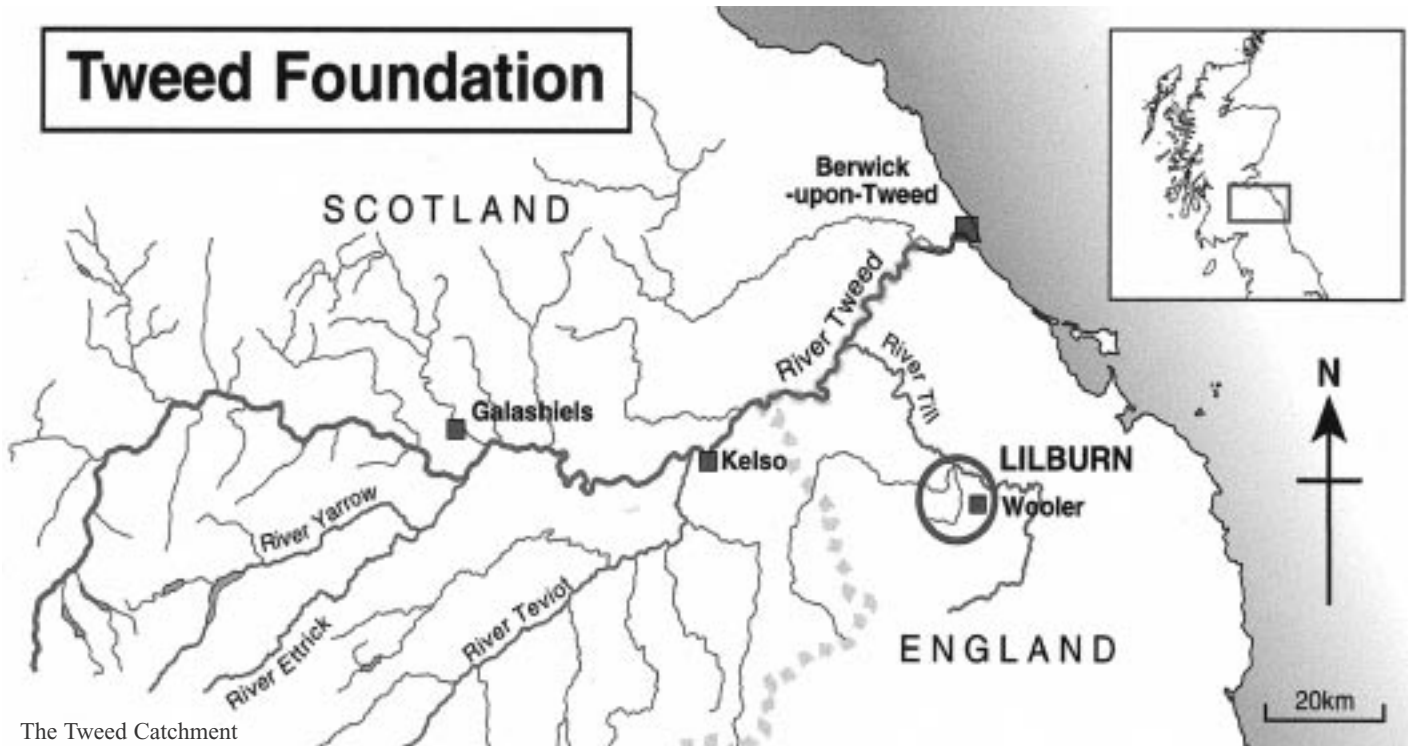
Overall the project has been a great success in creating habitat and landscape improvements. The fact that the heavy sediment load has resulted in both creating and destroying planned features is a valuable lesson to ensure this issue is a key consideration in designing and executing future schemes in similar catchments. The space provided by the University campus site, and freedom from risk of flooding, also provided the possibility to experiment and allow natural processes to shape the final habitat variety and character.

The Work of the Tweed Foundation

The Tweed Foundation is a charitable trust set up in 1983 by the River Tweed Commissioners to conserve and enhance the trout and salmon stocks of the Tweed.

For many years the Foundation has been undertaking river habitat enhancements supported by substantial grants from Southern Borders Enterprise and the EU under the Borders Objective 5(b) Programme. In addition to survey, research and extensive in-stream rehabilitation works, more than 50 km of watercourse have been fenced in the past five years alone to protect them from the effects of over-grazing, with many of these stretches further enhanced by programmes of marginal vegetation and tree planting. Typically less than one third of a stretch is planted with trees, with willow stakes grown close to the margin and Rowan, Birch and Aspen higher up the bank. A nursery in the Borders even grows local native vegetation for establishing on the margins to enhance the rate of recovery. Here, Luke Comins, the Foundation's Project Officer describes some of their work and its main objectives.

Salmon: the economic key - A recent study undertaken on the Tweed showed that the Salmon fishing brought £12.5 million a year to the local



The Tweed Catchment

economy and supported 500 jobs which is particularly valuable in a fundamentally rural economy. From this it is clear that the fish stocks of the river are of vital importance to the region and everything should be done to sustain the health of the river.

Managing a resource that spends half its life in the sea as far away as Greenland is never going to be simple but there is great deal that can be done to improve the lot of the Salmon in the freshwater stage of its life. The work of the Foundation falls into two main stables; scientific research and practical habitat management. The first job is to find out exactly what is there (and what has been in the past) in the way of fish stocks. In a catchment of over 5,000 square kilometres and 3,000 kilometres of watercourse this is a large task. There are a number of tools that are used in building up a picture of salmonid populations.

The surveying of the juvenile salmonid populations through electro-fishing in the tributaries is crucial in understanding the status of the population base. This gives information on fish densities, species diversity and age structure. Scale reading (fish scales can be read like tree rings) gives a potted biography of individual fish - its age, time spent in the river and in the sea, and the number of times it has spawned. Analyses of catch records show what has happened in the past: On the Tweed there is evidence of a distinct cycle of changes that swing between spring and autumn dominated runs of salmon.

Awareness of such cycles is essential for both understanding the present, and for shaping future management.

Recently, the Foundation carried out a radio tracking programme to find out more about the nature of these different runs of salmon and where they came from within the system. This involved the tagging of fish at the estuary and following them to their spawning destination; it showed that 75% of spring fish headed up the Ettrick, a tributary that represents just 10% of the catchment. This meant that in the first half of the season the fishery is dependent on a small area and as a result is more fragile. This information enables effective targeting of areas for the other side of the Foundation's work - habitat enhancement.

Quantity with quality: the twin goals of habitat enhancement -

The Habitat Enhancement Programme targets the headwater streams that are the production powerhouses of salmon and trout for the whole system. The approach is twofold, concentrating on habitat quantity and quality. No matter how good the habitat is on a burn, it is little use to migratory fish if they cannot reach it. On the Tweed, to date, over a 1000 man-made obstacles have been found including weirs, fords, bridge footings, culverts and water intakes. The Foundation has already opened up over 400 miles of spawning and nursery habitat previously unused or under utilised by fish by removal of the obstacles or the installation of fish passes.

The second aspect is improving habitat quality. Good habitat consists of a balance between pools for larger fish and riffles with clean gravel acting as a spawning substrate. Lush bankside vegetation protects the bank against erosion, acting as a cushion in high flows and provides habitat for insects which make up a large part of a fish's diet. Clumps of trees along the bank help give protection from predators and their shade keeps the water temperatures down in hot summers.



Lilburn 1993 - Before fencing showing effects of over-grazing

In recent years agriculture, forestry and drainage have resulted in a decline in the quality of streamside habitat. The numbers of sheep and cattle in the uplands has meant that riparian vegetation has been grazed to a minimum, weakening bank strength which leads to erosion in spates. What ensues is the development of a wider, shallower stream that holds little potential for fish due to the lack of depth and cover.

in its entirety which not only improves the fish populations of the Tweed but enriches all forms of riparian wildlife whether it be plants, birds, mammals or insects.

To assess the status of the Tweed's nursery areas every stream in the catchment has been walked and surveyed. Information on the status of bankside vegetation, erosion, substrate, the condition of fences and possible obstacles has been recorded. From this, together with information of the carrying capacity of these streams from electro-fishing surveys, means that it is possible to target badly degraded areas

for enhancement. Together with the radio tracking information, which highlighted the importance of the Ettrick as supporting a sensitive population of fish, it is possible to carry out habitat enhancements that will have the maximum benefit.



Lilburn 1996 - Three years after fencing showing recovery

Much of the Tweed Foundation's work, in conjunction with farmers and landowners, is spent improving the burns through the fencing off of livestock which enables natural regeneration to 'heal up' the burns. Usually, nature is given a helping hand in the form of the planting of native riparian trees and the introduction of marginal plants such as Sedge, Water Mint and Reed Canary Grass. In extreme cases, where the structure of the burn is badly degraded, instream works are employed using rock and timber to protect banks, narrow channels, encourage sinuosity, and create pools. The aim is to rebuild the riparian ecosystem

the organisations with an interest in river management. The bid, which involves a total spend of £4 million over the next three years, is made up of over 20 projects put forward by the various member organisations of Tweed Forum. The Tweed Foundation is leading one of the biggest projects which aims to continue the riparian and instream habitat enhancement work that has already been carried out around the catchment, that will not only help safeguard the fish populations for future generations, but also enrich the landscape and all flora and fauna of the

Tweed Rivers Heritage Project - Recently the Tweed Foundation has been one of the lead partners in an application to the Heritage Lottery Fund called the Tweed Rivers Heritage Project which aims to conserve, enhance and raise awareness of the natural, built and cultural heritage of the river and valleys of the Tweed catchment. The project has been submitted by Tweed Forum, the body encompassing the interests of

The Tailby Meadow River Improvement Scheme

Dr. Adam Kwolek, University College Northampton, describes some aspects of a monitoring programme carried out by college staff on a small improvement scheme on the River Ise near Desborough, Northamptonshire. Future publication of details of the project, including its inception and the results of the invertebrate monitoring, is planned.



River Ise at Tailby Meadow

The Improvement Scheme - In 1994, following collaboration between the Northamptonshire Wildlife Trust and the Operations and Engineering division of the (then) NRA, a 250 metre section of the old meandering course of the River Ise at Tailby Meadow Local Nature Reserve was re-instated. The river had been channelised over a century ago, and was at a much lower level than the re-instated meanders so a weir was built to force water through the meanders whilst retaining some flow through the channelised river. Berms and riffles were also incorporated into the new meanders. This operation was carried out in accordance with the draft management plan for Tailby Meadow where one of the stated aims is to “conserve and enhance the wetland habitats, with priority afforded to the River Ise and its improvement”.

Monitoring the Scheme - University staff have been monitoring the project since 1994 and in particular have investigated the colonisation of the restored section by aquatic invertebrates. Sampling has taken place on nine occasions between September 1994 and April 1997. A principal aim of the research has been to compare development of the macro-invertebrate community in the re-instated river channel with that in the adjacent channelised section of river to establish whether habitats had been created for a more diverse range of species.

Results of Monitoring - Initially the number of families of macroinvertebrate increased in the re-instated section whilst remaining steady in the channelised river. However, the last sampling date showed a small decrease in the number of families in the former and it was also noted that taxa associated with fast flowing conditions had decreased whilst taxa associated with slower currents had increased. For example, slower currents were indicated by large increases in the number of snails belonging to the genus *Lymnaea*. There was also an increase in the numbers of the mayfly *Caenis* in riffle zones, indicating silting. In addition a River Corridor survey in July 1998 revealed that the restored channel had been overgrown by macrophytes

such as Sweet-grass (*Glyceria*) and Reed Canary-grass (*Phalaris*) leaving very little of the channel as open water. Overall it was clear that there was an insufficient flow of water in the re-instated section. There were at least four causes of this. Firstly, water continued to pass through the channelised section even under low flow conditions. It was necessary to maintain the channelised section for flood control

purposes during times of peak flow, but more water could safely have been diverted through the re-instated section. Secondly, the re-instated channel was too wide for the volume of water passing through it. The channel dimension had been based on the size of the old meandering course without any consideration of the height of the weir or the amount of water that would flow through the re-instated channel. Thirdly, most of the fall in the re-instated section was at the end of the channel with most of the channel having only a slight gradient. For most of its length, the bed of the re-instated channel was therefore too high compared to the bed height of the channelised river. Fourthly, on two occasions, vandalism has reduced the ability of the weir to raise water levels.

Remedial Action - A primary aim of monitoring is to evaluate a given project and to trigger action if it is deemed not to be achieving its aims. With the above results and observations in mind a meeting was held with representatives of the Environment Agency to decide on the future course of the project. To remedy the insufficient flow with its attendant ecological

consequences, a number of measures were implemented in early March 1999.

These included dredging out silt deposits at the entrance to the restored section and removing the tops of some riffles with the aim of lowering the mean height of the re-instated channel in relation to the weir. Also, in places the channel was narrowed and the channel profile



Recent enhancement works

modified to increase flow velocities and habitat heterogeneity. Invertebrate monitoring occurred before the re-engineering works and will continue through the year.

The science/art of river restoration is, to an extent, still in an experimental phase. This project has demonstrated the role of monitoring and the importance of the willingness and financial ability to act if monitoring shows the aims of restoration are not being achieved.

The Darwen River Valley Initiative: Community participation in river rehabilitation

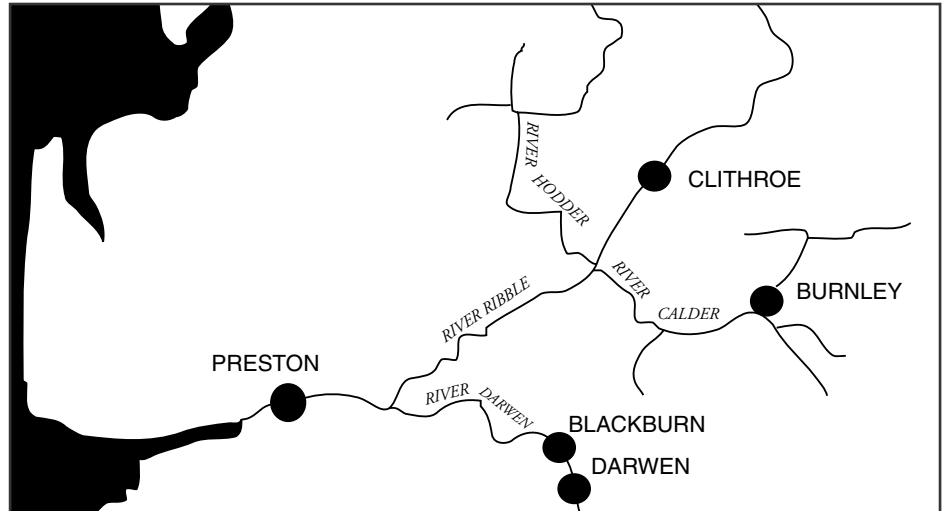
The Darwen River Valley Initiative is part of the Mersey Basin Campaign, a 25 year environmental project which was launched by Michael Heseltine, then Secretary of State for the Environment, in 1985. Centred on the Mersey catchment the Campaign unites local authorities, businesses, government agencies and voluntary organisations in a concerted drive to improve the water quality of all the rivers within the Basin, encourage people to value and look after their watercourses and waterside environments and to stimulate waterside developments that are attractive for housing, business, leisure and wildlife. Here David Hortin, Co-ordinator of the Darwen RVI, describes some of the issues and problems the Mersey Basin Campaign is addressing, and the progress being made.

The Mersey Basin Campaign:

Catchment Concept - The Campaign focuses on all watercourses in the Mersey basin and the R. Darwen, situated on its northern fringe, is part of the Campaign area by virtue of the Leeds to Liverpool Canal passing through it's catchment. With it's source on the moors to the south of the industrial town of Darwen, Lancashire, the R. Darwen flows north through channel and culvert to the western fringes of Blackburn where it turns in a westerly direction. Flowing through the beautiful rural landscapes around the villages of Hoghton Bottoms, Samlesbury Bottoms, and Higher Walton, it eventually joins the River Ribble at Walton-le-Dale on the outskirts of Preston. There are few sections along the 28 km course of the river where the channel has not at some time been altered by human activity.

Catchment Issues

Established in October 1996, the Darwen RVI initially focused on the river within the Borough of Blackburn with Darwen and was extended in 1998 to cover the full length of the watercourses in the catchment. The expansion of the project into the surrounding countryside, has placed a different emphasis on the issues which impact on the river environment; in the urban areas the main



Catchment Map

issues are largely those relating to litter, water quality, access and awareness - being able to find the river is in itself sometimes a challenge! Now agriculture, and nature conservation have emerged as having a greater emphasis than they did before, although the others have not become less important. All the issues identified through consultation with local groups, individuals and organisations, are closely linked and dealing with one issue separately is more or less impossible. Litter problems and some other issues are being dealt with on a catchment scale to raise awareness that problems that manifest themselves in one

the Ribble catchment have been developed; The Environment Agency have initiated an RVI on the R. Ribble, a strategy is being implemented for the Ribble Estuary, and another RVI, 'River Enhancement East Lancashire (REEL)' exists on the Calder catchment, a tributary of the Ribble. These four initiatives are now discussing joint working and co-operation across the whole Ribble catchment, to provide holistic management of the watercourses by avoiding duplication, and to provide a strategic framework in which to work - more appealing to the funding bodies. Importantly, each initiative will still operate



Shorey Bank - focus of RVI enhancements

autonomously at local level, but will be working towards common aims to benefit the whole catchment, taking the objectives of the Mersey Basin Campaign further afield, and complimenting the Ribble LEAP.

The formation of this Ribble 'Source to Sea' Forum is still in it's early stages but already producing a great deal of excitement. Development of the forum will lead to a project that produces tangible benefits for the catchment, which will

also become apparent elsewhere - less litter along the North

West's Golden Coast perhaps?

area, often originate elsewhere. The ways and means of tackling this are covered in the new strategy, to be launched in July.-

The Darwen RVI has provided the model and catalyst from which other initiatives in

For further information on the Darwen RVI, or a copy of its forthcoming strategy, please contact RRC or David Hortin on 01254 265163.

Events, Publications and Issues

Readers are invited to provide information for this section, or submit more substantial contributions to feature elsewhere in the Newsletter. Please contact the Centre to discuss feature articles and let us have your 'Information Items' by the end of September for inclusion in the November Newsletter.

EVENTS

On 25th-26th March a meeting in Denmark, involving representatives from over 20 European countries, set up a Management Board for the European Centre for River Restoration (ECRR). Through support from EU LIFE and COST funds the ECRR hopes to facilitate networking of knowledge and experiences of river restoration and so enhance the extent, and effectiveness, of rehabilitation investment in rivers and riparian areas throughout Europe. Its third newsletters has been drafted and will be available in late summer. For a copy, or more information about how you can participate in the networking facilitated by the European Centre, contact ECRR c/o NERI, Vejlsovej 25, PO Box 314, DK-8600 Silkeborg, Denmark.

The Environment Agency's (with support from Broads Authority and British Waterways) R & D Technical manual on 'Waterway Bank Protection: a Guide to Erosion Assessment and Management' was launched on the banks of the RRP River Skerne restoration project site in early May. The Skerne project demonstrated 'soft' erosion control methods and these, along with many others, feature in this excellent practical manual. The document is liberally punctuated with colour photos and clear artwork. It provides step-by-step assessment procedures for determining the causes of erosion 'problems' and then advises on a series of measures grading from 'do nothing', 'address causes within the catchment but leave the

symptoms alone', 'soft bio-engineering solutions' through to 'hard engineering' as a last resort. The hefty price of £95 is justified.

CIWEM's annual presidential conference on 22nd-23rd July at Keble College, Oxford, is entitled: 'Sparkling Rivers Full of Life - Integrated Catchment Management.' There will be contributions from EA, EN, RSPB, WRc and IoH with the aim of providing a thought-provoking overview of the issues facing those involved with modern catchment management.

On the 14-16th of September the Institute of Fisheries Management holds its 30th Annual Study Course at Sparsholt, on 'Habitat Management of River's and Lakes'. The first day is dedicated to rivers and restoration, with many well-respected speakers. RRC is looking forward to actively participating, with Nigel Holmes giving the Menzies Memorial Lecture.

PUBLICATIONS & RESEARCH

Over the past 18 months Brenda McEvoy has been working for RRC and Middlesex University's Flood Hazard Research Centre gathering together information on world-wide information on research activities pertinent to river rehabilitation. Her report has recently been received and the information gathered has been entered on to RRC's database. For more information, contact the Centre. RRC has also recently published its Business Plan for the next five years - copies are available on request from RRC.

Issues

Mark Diamond and Elaine Fisher at Environment Agency, Warrington (mark.diamond@environment-agency.gov.uk) hope to provoke discussion, and invite comments, via these thoughts on developing a Strategy for River Restoration.

'It is often said that river restoration should be undertaken at the catchment scale but in general " river restoration" currently takes place at the reach scale. The two key reasons for this are probably: a) lack of understanding of processes at a catchment scale and b) the relative ease with which support can be acquired for short-term reach scale 'demonstration projects'.

If we wish to achieve catchment scale restoration, but are driven to undertake reach scale improvements, then the latter need to ensure that they are undertaken to support catchment scale objectives. A simple strategy with five components is suggested that can be improved incrementally as knowledge emerges.

- Develop a systematic approach to catchment analysis to identify and prioritise where improved management should be applied.
- Improve understanding by adopting 'adaptive management approaches' - these involve monitoring the outcomes of actions and, where necessary, taking corrective actions to achieve the desired outcomes.
- Improve partnership with local communities - those are ultimately responsible for successful river restoration.
- Have a goal to restore the function and form of the remaining less disturbed fragments of river systems that harbour habitats and species of high conservation value.
- Promote rehabilitation of urban rivers using best practice (with respect to sustainable development) to improve quality of life.

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

The following statutory organisations provide Core Funding for the River Restoration Centre and their Representatives form the Board of Management alongside RRC's Directors.

