River Restoration NEWS

Issue 14
February 2003

NEWSLETTER of the RIVER RESTORATION CENTRE

RRC Network Conference 2003

April 28th and 29th - Bristol at the Marriot Royal Hotel

The response so far to the 4th Annual RRC Network Conference has been exceptional with many offers of papers and posters on a range of innovative subjects. The main themes of the conference will include Demonstrating Practical Applications of Riverine Research, Restoration Project Appraisal and Setting Sound Objectives. As always the aim of this conference is to let you know what is going on and get you all talking and even more enthusiastic about restoring rivers. As a result of the number of interesting papers proposed this year we are running two parallel sessions on the 2nd day to enable as many issues as possible to be addressed and to provide a forum for some example projects and updates to be examined.

This year our keynote speaker is Dr David P.F. King, Director of Water Management for the Environment Agency. In addition, Dr Andrew Black from the University of Dundee will be enlightening us about flood hazard management and the changing role of insurance, drawing on lessons learnt in Scotland, and Mark Lloyd from Thames21 will share his experiences about community participation and public perception of River Restoration.

The Frome as it waves goodbye before disappearing under a culvert in Bristol

RRC Workshops How We Can Help You

RRC is committed to promoting a best practice approach to River Restoration. One way of achieving this is through workshops tailored to participants' particular needs. They are aimed at either providing organisations with a general introduction to the concepts of river restoration, rehabilitation and enhancements or themed approaches that are a response to a recognised need to focus upon a particular area of river restoration.

During the last couple of years RRC has been involved in a number of such workshops. Lack of geomorpholocial understanding was, for example, identified as a key difficulty for new recruits at SEPA and SNH whilst themed symposia have included River Restoration of Chalk Streams and Rural River Rehabilitation and Sustainable Land Management.

Most recently a one-day discussion forum was held at Nottingham University in conjunction with Kevin Skinner (Integrated River Services) and Lydia Bruce-Burgess (Environment Agency). This addressed the all too often missing, but essential, issue of appraisal in River Restoration. The outcome of this is the subject of the article on page 2 of this newsletter and an example of a project appraisal is outlined on pages 3/4. A summary of the day will shortly be available on our website.

The Centre is keen to promote this kind of discussion and help to establish links between similar organisations and projects. Topics of current interest to River Restoration yet to be covered include *Funding for Projects, Fishing and Fisheries Management*, and *Catchment Scale Restoration*. If your organisation would like to help host a RRC 'topic' workshop, please let us know.

In the meantime if you feel that RRC can assist your organisation though training and/or helping your staff to spot and address River Restoration opportunities then please contact either Martin Janes or Jenny Mant so that we can discuss how we might arrange a workshop to suit your needs.

River Restoration Centre Annual Report 2001-2002

The Annual Report covering the period April 2001-March 2002 will be published on our website this year. Please feel free to download this if you require a hard copy. If, however, you are unable to print your own copy and would like us to send you one then please contact the centre and we will happily send you one.

INSIDE THIS ISSUE

'Appraisal: River Restoration's Missing Link'

Kevin Skinner (Integrated River Services) reports on a recent stimulating workshop that addressed the issues of River Restoration Appraisal. It was held on the 27th November 2002 and was organised by Kevin Skinner and Lydia Bruce-Burgess (EA) in collaboration with the River Restoration Centre.

For further information visit the RRC website

Background

In November 2002, inspired by discussions at the RRC Annual Conference in Stockton, a workshop was organised at the University of Nottingham. The aim of the workshop was to draw together a group of academics, policy-makers and practitioners to discuss the role of appraisals in river restoration and start to address realistic solutions to the difficulties faced at present. Project-appraisal is a vital component of successful (and hence sustainable) river restoration; without evaluation throughout a project we cannot know whether the most appropriate methods and techniques are being used and identify those schemes which have been successful. The main objective of the workshop was to provide a relaxed atmosphere where issues about policy, practical and financial constraints that currently inhibit appraisal procedures from being regularly undertaken could be voiced. Speakers were invited to the workshop to review the perception of appraisal and to specify the tools available within the context of River Restoration.

Workshop outline

A review of national practice (Lydia Bruce-Burgess) revealed some key constraints to the undertaking of appraisals which are:

- time and resources often focus on new projects rather than assessing previous ones;
- money invariably has to be spent over a short time thus precluding the undertaking of any monitoring and appraisals at a later date;
- restoration involves improving a degraded state sometimes resulting in the view that there is no need for an appraisal since any work will be enhancing the local environment.

The workshop programme included 3 main sections namely: an examination of the current status of appraisals in the UK; a review of appraisal techniques; and an outline of how monitoring and post-project appraisals can be more readily integrated into restoration projects and results disseminated.

The needs for both pre- and post-project appraisals (PPA) were reviewed by Andy Pepper (ATPEC Ltd) who acknowledged the difficulties of delivering PPAs that successfully satisfied all partners involved within a project; often the needs of funding bodies may differ from that of the designer or the promoter of a project.

The wide variety of techniques available that can be incorporated within the both pre- and post-project appraisal process were emphasised though a series of presentations. Judy England (EA) examined the role of ecology and Kevin Skinner (Integrated River Services) put the case for the importance of geomorphological assessment. In contrast, Mark Turner (Merseyside Campaign) examined the role of assessing public opinion and involvement within restoration planning and how this can lead to a feeling of community ownership of the project.

Finally, the day examined more procedural aspects of both monitoring and post-project appraisal (Kevin Skinner) and the importance of its promotion (Martin Janes, River Restoration Centre).

The workshop raised the profile of appraisal as a necessary part of any river restoration process. It provided a good insight into what techniques are currently available, encouraged over 3 hours of stimulating discussion and a commitment within the group to promote both pre- and post-project appraisal in the future. To this end, a more detailed outline of the workshop is currently being prepared and will shortly be available on the RRC website.

Haycock Associates and the Environment Agency (Thames Region) also provided additional financial and technical support.

Passford Water 100m upstream of a proposed deculverting site provides a good template for geomorphological and ecological design

A post-project appraisal of the restored River Cole (Wiltshire, UK)

In 1995, a 2km reach of the River Cole was restored, along with the River Skerne (UK) and Brede (Denmark) as part of the joint Danish and British EU LIFE Demonstration project. In this article, Luke Warren and Geraldene Wharton describe some post-project appraisal work conducted six years later in September 2001.

Restored reach with meandering planform.

Background

The River Cole is a fourth-order tributary of the River Thames with the meandering planform and low-width depth ratios considered typical of many lowland clay-vale rivers in the south and east of Britain. The expansion of Swindon in its headwaters over the past 50 years has had an increasing impact on the hydrology of the river, even though much of the 129km^2 catchment comprises predominantly rural land. This recent urban impact continues a long history of human alteration of the river and its catchment for land drainage and flood control, stretching back over 350 years. One significant modification in the 17th century was the impoundment and straightening of the channel for the operation of a water mill which resulted in a widened, deepened and heavily-vegetated trapezoidal channel.

The restoration of the River Cole aimed to demonstrate new techniques in the restoration of rivers and floodplains and details of the project have been reported in a series of papers published in Volume 8 (1998) of *Aquatic Conservation: Marine & Freshwater Ecosystems*. The River Cole, unlike many restoration projects, has benefited from a number of post-project monitoring studies. For example, Biggs et al., (1998) found that macroinvertebrate and macrophyte species richness recovered to pre-restoration levels within a year of the work being completed and Sear et al., (1998) have reported some preliminary findings relating to the morphological adjustments within both the restored and downstream reaches.

There is widespread agreement over the need for much more appraisal of river restoration schemes generally, especially to detect changes in geomorphology, ecology and hydrology over the longer term. To make advances in both the science and practice of river restoration it is important to learn from mistakes as well as successes. This study compared the macrophyte and macroinvertebrate assemblages and the diversity and the physical habitat features in the restored reach with both upstream and downstream control reaches six years after completion of the restoration works.

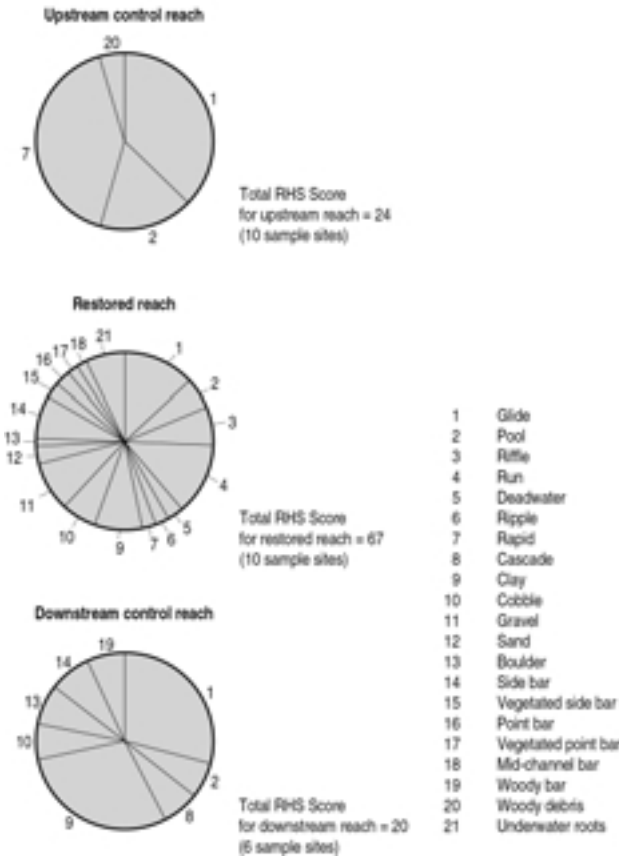
Field Sites & Methods

Three reaches were chosen for the survey of physical habitat and sampling of macrophytes and macroinvertebrates (see photos). This study used the physical habitats identified as important by the River Habitat Survey (RHS) methodology (Raven et al., 1998) but adapted the scoring system so that the method could be applied to 50m survey lengths (after Clarke & Wharton, 2000)[1]. Macrophytes are useful indicators of river health and have been referred to as ecosystem engineers because of their role in modifying a range of processes such as the trapping and deposition of fine sediments. They also provide shelter for fish and sites for invertebrates to colonise. Species richness and abundance (measured as % cover) were recorded. Macrophyte surveys used the Mean Trophic Rank (MTR) Survey method (see Holmes et al., 1999). Macroinvertebrates also play a key role in the functioning of river ecosystems and are an important componet of riverine food webs. Samples were collected using a standard one-minute kick sample and species richness and abundance were calculated for each sample.

Some key findings of the study

A comparison of the three reaches based on the RHS scores showed the restored reach to have a much more heterogeneous channel morphology and a greater variety of flow types (see pie charts).

River Habitat Survey in-channel features recored in the three reaches.
Note: each habitat feature (ie Glide, Pool) is expressed as a % of the total RHS in-channel score for the survey reach



Downstream control reach with steep-sided banks.

Conclusion

This study provided a valuable opportunity to gain further insight into aspects of the geomorphology and ecology of the River Cole six years after completion of the restoration works. Compared to the upstream and downstream control sections the restored reach is much more varied in terms of its physical habitat and macrophyte and macroinvertebrate communities and the conservation value of the river has therefore been increased.

If the goal of restoration is to create self-sustaining river systems, continued post-project monitoring is needed to detect and understand changes over the longer-term.

Furthermore, the restored reach of the River Cole now has 11 out of the 14 physical habitat features characteristic of a small lowland riffle-dominated river (Raven et al., 1998). The macrophyte assemblages on the River Cole showed an interesting pattern of significantly higher species diversity (but lower abundance) in the restored reach compared to both upstream and downstream control reaches, a finding which is consistent with other studies. This increased diversity can be explained by the small-scale differences created in the physical environment of the restored section, with each habitat supporting a different suite of macrophyte species. In contrast, the upstream and downstream control reaches had a macrophyte assemblage dominated by a few species, a characteristic feature of uniform, modified channels (Dawson, 1988). Macroinvertebrates showed a pattern of higher species diversity and abundance in the restored reach indicating that restoration has been successful in creating a variety of physical habitats that can support a diverse macroinvertebrate community. Restoration is important in re-creating in-channel heterogeneity and re-connecting the river with its floodplain both of which help macroinvertebrates to survive disturbance events such as flooding through the occupation of flow refugia (see for example Rempel, 1999).

Upstream control reach with a homogeneous channel and abundant macrophyte growth at the channel margins.

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Acknowledgements

LW and GW would like to thank Karen Phillips (formerly RRC) for background information; Tracey Lee for assistance with the field work; and the National Trust for permission to conduct the field surveys.

[1] Further information about the study can be obtained from either Luke Warren (l.warren@ucl.ac.uk) or Geraldene Wharton (g.wharton@qmul.ac.uk). A full scientific paper is in preparation.

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.

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

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

North Yorkshire 'Living Wetland' receives CIWEN/RSPA funded award

The RSPB/CIWEM Living Wetlands Award is a new award, established this year as a means of recognising and rewarding projects which demonstrate the multiple functions and sustainable use of wetland habitats. The winning project announced on 4thFebruary 2003 during the World Wetlands Day Conference at the London Wetlands Centre, linked industry, community and conservation groups to create a chain of nature reserves on former mineral workings in the Swale and Ure valleys of North Yorkshire. The judges were impressed by the project's ability to create valuable wildlife habitats plus a landscape that also benefits the local community.

The standard of entries was so high that two runner-up categories were created.

Shropshire farmer Mr. J. Simister was highly commended for his demonstration farm which was converted from arable farmland to wet grazing meadow whilst Tilfen Land, housing developers, were commended for creating a wetland on a formerly contaminated urban site in Thamesmead, London.

The closing date for entries for the next award will be January 2004.
To make an application or for further information contact:
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E-mail: helen@ciwem.com

Swale and Ure, North Yorkshire

Leys Estate – Banchory, Aberdeenshire

This article shows what can be achieved with the aid of small local grant schemes on tenant farmed Estates. Under the enthusiastic management of Thys Simpson, Countryside Ranger of the Leys Estate, the Coy Burn, a tributary of the Dee, is now thriving.

Leys Estate has recently carried out some excellent small-scale, low-cost, practical initiatives to enhance the Coy Burn and provided innovative solutions to common problems. On this traditional Scottish lowland mixed estate a large proportion of the land is farmed by tenant farmers.

Works have been carried out on the Coy Burn itself and on most of the tributary ditches with the aid of a grant from the Dee Habitat Enhancement Initiative (DHEI) and without the need for costly planning permission. Diffuse sediment input has been reduced by installing 16 small silt traps (approx £180 each) on the tributary ditches with the type of mechanical digger commonly used on farms. A simple but strong construction of three untreated larch logs and some permeable 'Terram' membrane forms the basis of the silt trap. A small incentive is then paid by the landowner to the tenant farmers to keep the silt traps clear using their own machines. The main reason for this initiative was the very large cost to the Estate to dredge the main burn every few years and the problems associated with disposing of such a large volume of spoil. In addition, the Estate owner wanted to stimulate good, sustainable farming practises and to improve the degraded burn habitat.

Narrowing of the burn

Silt trap

In-channel works have centred upon enhancing the features that are now developing since the last major dredge, some 5 to 10 years ago. Rocks, from field gatherings after ploughing, were used to create riffles, at a cost of about £7/m, and to narrow runs to clean the natural gravel bed. Though Salmon currently only have limited access to the burn the overall habitat has improved dramatically. The annual monitoring programme completed by the River Dee Biologist and the Head Water Bailiff has confirmed that the burn is indeed thriving. For example, within a year the Brown Trout population on the installed riffles has doubled.

These two specific examples, riffles and silt traps, show what can be achieved by making use of local grant schemes to tackle common problems; a watercourse can still be enhanced whilst successfully managing a largely tenanted Estate.

The DHEI is managed by Grampian Farmland Wildlife Advisory Group (FWAG) with money contributed by all river Dee proprietors, Scottish Natural Heritage, and advised by SEPA.

For further details email: thys.simpson@leysestate.co.uk.

Chinbrook Meadows - 'a river released'

The Quaggy Brook that flows through Chinbrook Meadows in Lewisham has recently been released from its concrete channel. Julie Baxter gives an insight into the planning required to bring about this project from a Landscape Architect's point of view.

For further information contact Julie.Baxter@environment-agency.gov.uk

The river still in its concrete channel

Chinbrook Meadows is a large park in south-east Lewisham near Grove Park station. The park is surrounded by a densely populated residential area and has been open to the public since 1937. The Quaggy River, which flows through the central area of the park, was straightened, enclosed in an open concrete channel and hidden from view by dense privet hedges in the 1960s. This effectively cut the park in half and created a dark, unattractive feature.

Partnerships and finance

The Environment Agency and the Quaggy Waterways Action Group (QWAG) identified possible enhancements as outlined in QWAG's Landscape Character Assessment named 'Operation Kingfisher'.

After negotiations between the Borough Council and the Environment Agency money was set aside because of housing development close to the river in the Park. Continued enthusiasm for the project from QWAG, the Council, the landowner and the Environment Agency ensured that a preliminary landscape design feasibility and community consultation was completed. The residents overwhelmingly voted to naturalise the river and redesign the park.

With this knowledge, the 'Quaggy River Partnership' was born and a project team formed to ensure that, along with the technical experts, the needs and concerns of the local community were addressed and their feedback included in the design process. Throughout the project it was recognised that to be successful there needed to be an overall vision and that extensive consultation continued with all interested parties throughout the design process.

In all, the final cost was about £1.1M. As the project would reduce the flood risk to a number of local houses and provide tremendous environmental gain, the Environment Agency provided £250K, Lewisham provided £200K and the remainder was raised by Groundworks through a variety of sources.

Design

The River Quaggy is a typical 'flashy' urban river that can be subject to severe flooding and several houses adjacent to the park were at risk. Re-designing the landform of the park provided the opportunity to allow the river space, thereby reducing the risk of flooding further downstream. Despite some constraints on the position and construction of the new course, including a new sewer located in the park and safety considerations, the old channel was partly broken out within the park and the concrete re-used as a base for the footpaths that would reflect the meandering of the river. The remaining areas were hidden under new landforms. The river course now comprises a river valley that averages 7m in width. It can move and readjust its course in complete safety. This natural re-adjustment provides in-stream and marginal habitats and sediments for further downstream. The low-flow channel was designed to be narrow enough to be

The river released! (construction phase)

sustainable through the summer months, as opposed to the old concrete channel that was over-wide and shallow.

The design of the park, which centres around a new accessible riverine environment, aimed to create a beautiful place that recognizes the heritage of the park, maximizes the biodiversity potential and balances the needs of today's community but without compromising the flood risk. The landscape design incorporated many features that, where feasible, were aimed at reflecting the natural flow of the river and create structure to the overall project. Examples of these include:

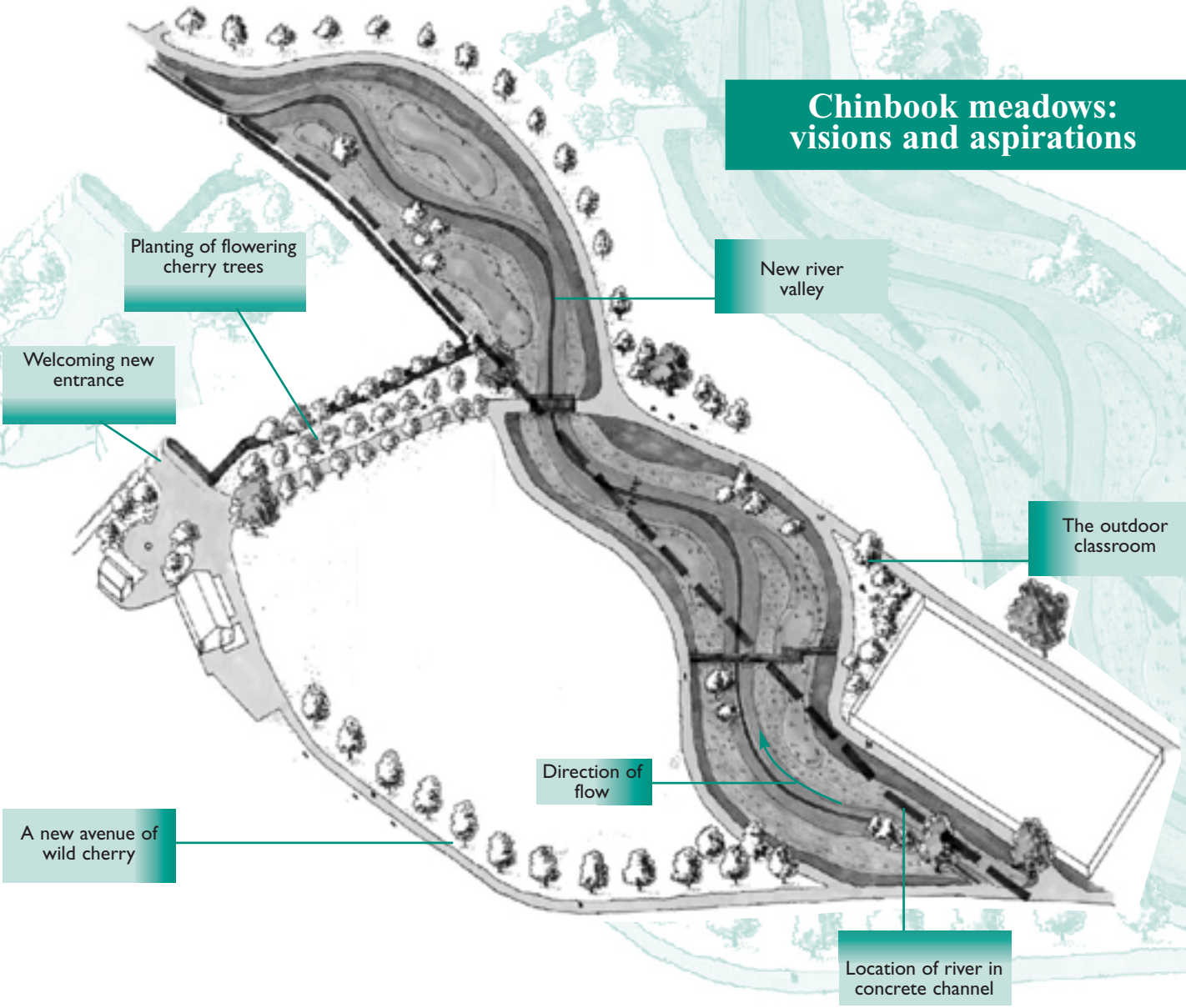
- An outdoor classroom provides a valuable educational area for school children. The seats are a good example of recycling material from the site since they are made from the trees cut down in the park during the river construction; a boardwalk and pond dipping platform make an ideal refuge and breeding area for fish.
- The river valley itself provides a variety of habitats that maximize the ecological potential of the area. Included are clusters of native trees and shrubs, damp areas of grassland and marginal plants. The views of the river have been kept open and access to the water is via gently sloping banks.
- Further downstream, an avenue of native trees has been planted which now creates interest along the Green Chain walk.
- To the south-western edge of the park poplar trees are coming to the end of their natural life and these are being replaced by wild cherry *(Prunus Avium)* to form an attractive and graceful landscape feature.
- The entrance to the park has also been re-designed to afford a welcoming, safe place, whilst the formal garden has been replaced by an orchard of flowering trees.
- Some screening of an existing fence was also necessary and native species were chosen to provide a good habitat for birds and invertebrates.

The benefits of such features are already being appreciated; there is now a feeling of openness and light in the park, far more visual interest, potential habitats for wildlife and not least an added community amenity.

The success of the project can be attributed to a partnership approach and the flexibility of all involved; for example many project meetings were held after working hours to allow voluntary members to participate. The community consultation group has now become the 'Friends of Chinbrook Meadows' which shows the renewed and continuing interest in the park and its revitalised river. A management plan to maintain the park and river in the future is currently being developed.

Participating partners include:
Lewisham Borough (LB), Engineering Improvements and Landscape Architecture Groups (EA), Groundwork Thames Gateway South-East, QWAG, Glendale Grounds Maintenance, Friends of Chinbrook Meadows

Chinbook meadows: visions and aspirations



News and Events

Conferences and Workshops

Third Symposium for European Freshwater Sciences (SEFS3)
University of Edinburgh, 13–18 July 2003

Second Circular and Call for Papers: available now
Abstract deadline: 14 March 2003
Registration deadline: 12 May 2003.

For more information: http:// www.sefs.info

Workshop on the Sustainable Management of Urban Rivers and Floodplains
Birmingham, 25 April 2003

The workshop will consider and debate current know-how and best practice in urban land-use planning and whole river basin modelling; sustainability indicators for urbanised river systems; best practice in citizen and stakeholder consultation and involvement.

For more information email: mark.scott@environment-agency.gov.uk

River Symposium
Queensland, 2 -5 September 2003

This conference aims to make a difference to the declining state of rivers and waterways globally. It invites discussion on the problems faced by urban rivers as well as offering solutions for future river management. Also there is a call for nominations for the 2003 River prize.

For more information: http://www.riverfestival.com.au/2003/content/

International Course on Wetland Restoration
Lelystad Netherlands, 2 June-1 July 2003

The goal of this course is to provide participants with the knowledge and skills necessary to develop and run a wetland restoration project.

For more information: http://www.ncr-web.org

Lowland River Rehabilitation
Wageningen, The Netherlands, 29 September – 3 October 2003

The Netherlands Centre for River Studies (NCR) and RIZA, the Institute for Inland Water Management and Waste Water Treatment will host an international conference on lowland river rehabilitation, and invite participation by river scientists, managers and policy makers. The main themes is Rehabilitating natural dynamics, landscapes and biodiversity in large regulated lowland rivers: opportunities and constraints, costs and benefits.

For more information: http://www.ncr-web.org

Working with Rivers
Banchory Business Centre, Near Aberdeen, Scotland 15 April 2003

Using practical case studies, this workshop aims to introduce local authorities, land managers, conservation bodies, fisheries boards and engineers to the geomorphological processes that control river behaviour, and determine the success or failure of engineering interventions. This workshop explains the processes that operate in rivers and examines best practice techniques for a range of management issues. Case study exercises and a short field visit will be used to guide participants through the process of assessing the situation in the field. (Due to demand this is a repeat of the October 2002 workshop)

Organiser: SNH in association with the River Restoration Centre, SEPA & SCRA
Cost: £50 (including lunch & refreshments)
To book a place email: kate.murray@snh.gov.uk

Publications

Understanding Wetlands – Fen, Bog and Marsh
Sylvia Haslam, University of Cambridge UK
Taylor & Francis; ISBN: 0415257948

Understanding Wetlands explains how wetlands are created naturally and how they sustain themselves. It is an integrated account of wetlands and should provide a valuable reference for students of ecology, biology and environmental science.

To be published 23 July, 2003 £75.00

Do You Have Any News?

The River Restoration Newsletter aims to inform its readers not only about new innovative Restoration Projects, but also to highlight new techniques and ideas that are now being incorporated into Restoration Design. If you would like to share your experiences with others and feel able to contribute to the newsletter then please contact Jenny Mant.

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 Scottish Environment Protection Agency · Rivers Agency · Scottish Natural Heritage