



# River Restoration NEWS

Issue 20  
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NEWSLETTER of the RIVER RESTORATION CENTRE

## What has RRC been doing over the last year?

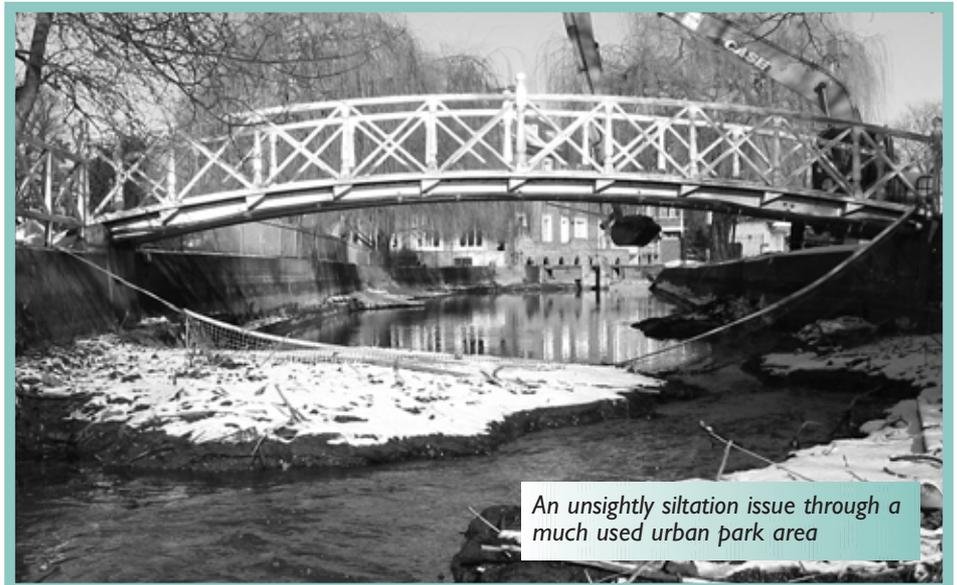
*Our previous review was in November 2003. So we thought it was time to provide an update. This article aims to outline the types of restoration issues the UK is addressing and the range of advice and support the RRC team are able to provide.*

### Projects and advice

#### England and Wales

In January 2004, despite hail and gale force winds, RRC staff visited the Rivers Colne and Lea (north/north-east London). The main objective was to suggest a variety of techniques to improve fish habitat although options went beyond this tackling wider biodiversity issues at the reach scale. Similar issues were evaluated by the team on the Rivers Eden and Darent in Kent even though urban constraints, concrete channels, tidal influences, and potentially contaminated land added complicating factors in the case of the Darent.

In Cornwall the Red River, so called because of its historical association with tin streaming, has been heavily contaminated over time with its planform and gradient substantially changed in an attempt to rapidly evacuate minewaters. Decline in this industry has resulted in an increase in fauna and flora to the extent that the Environment Agency (EA) and Kerrier District Council enlisted the Centre's help in an effort to improve the lower river system's habitat, outline sustainable ways of dealing with the current road flooding (caused by years



An unsightly siltation issue through a much used urban park area

of river diversions) and consider local amenity requirements.

The River Fal (also in the south-west of England) was artificially straightened and incised to 'improve' agricultural land in 1969. Spoil was dumped along the bank resulting in a channel disconnected from its floodplain and so much change in the local hydrology that the surrounding Goss Moor changed from wet mire to a dry scrubland. Suggestions about how to rectify this situation, included drain blockage using on-site scrub, and in-channel improvements aimed at encouraging 'wetting-up' of the moor were discussed with English Nature.

In the summer of 2004, it was brought to the Centre's attention that a landowner in Sussex was very keen to 'naturalise' a 6000ha estate

including 2.2km of river and associated floodplain. Re-profiling banks, raising the bed and reintroduction of meanders are just a few of the options that are now being considered for this potentially exciting restoration project. The RRC remain involved with this initiative (funded by Defra

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and the EA), in an advisory capacity, so we will keep you posted as it develops.

And, staying in Sussex, we are pleased to report that the Shopham Loop project (as featured in the November 2003 newsletter and updated in this one) is now complete. There are ambitious plans to monitor this project through a joint venture with the University of Southampton and the EA to see how it adjusts not only terms of its morphology but also its ability to support a range of fauna and flora.

Moving to the north-west of England many of the problems faced in Lancashire are directly related to historical impacts of milling activities, where the river's energy has been harnessed for cotton production and many rivers have disappeared into concrete culverts. Some are now beginning to see daylight leading to an enthusiasm to restore them, if not to their former glory, at least to introduce a range of habitats, in itself a major challenge!

Perhaps it will come as a surprise to some that even the Lake District has its share of issues and the Pow Beck at St Bees is one such example. Centuries of schemes to keep the surrounding floodplain dry for agricultural purposes has meant that there has been a drastic decline in habitat for Redshank and Yellow Wagtail along part of their migratory route. By working with the Farmer, the local FWAG officer, Defra and the EA, the RRC were able to provide short term solutions to help re-wet the land in accordance with the requirements of the Defra funding for the farmland, but also suggest options for longer-term enhancement of the river.

It has recently been accepted that there is scope within flood alleviation schemes (FAS) to demonstrate how multi-functional benefits can be incorporated for enhancement of the wider catchment. Nigel Holmes, working in an RRC Advisor capacity, is helping the Project Officer (Deirdre Murphy, Defra) to bring together information required to forward such a project based on the Rivers Laver and Skell in the north-east of England, working alongside the Ripon FAS. Broad-scale catchment modelling, ascertaining the impact of

floodplain woodland on flood flows, the extent of gripping in the headwaters and compiling a report on financial incentives to achieve multiple objectives are just some of the components currently being undertaken. Updates on this project will be provided by RRC, as appropriate, partly as one of our core-objectives to disseminate information but also to ascertain how feasible such a project is when implemented on the ground.

Moving west the RRC previously completed a scoping study about the possibility of reinstating remnant meanders along the River Teifi in Wales. Through funding from the Countryside Council for Wales, a detailed survey and feasibility study is now being undertaken by Cranfield University. The RRC are involved in this phase of the project to help advise on the restoration design.

### *Scotland*

Edinburgh's 'south-east wedge' redevelopment involves a large parcel of land around the Niddrie Burn. RRC has been involved with the project for a number of years, and recently has provided further fluvial geomorphological input through RRC Advisor Dave Gilvear. The Centre is supporting the return of the burn to a more natural channel with all the associated benefits to wildlife and the local community. The burn restoration is supported by SNH, SEPA and Julie Waldron (ex. Thames EA Landscape Group) of Edinburgh city council. This site has the potential to be an excellent demonstration site of how to integrate river rehabilitation within urban planning and re-development.

In 2002 RRC produced a short report for SNH on the idea of restoring flow to a defunct side channel on Dunglass Island in the River Conon, Highland. The project was to be a joint venture between SNH and the Conon Fishery Board. With funding and work in kind from the landowner and Scottish and Southern Electric, the works were completed last year. The side channel now once again flows through its alder lined course.

The new Royal Bank of Scotland world headquarters overlooks the Gogar Burn, west of Edinburgh city centre. Advice was provided on the mirroring of a meander bend, once planning permission had granted an access ring road too close for comfort to the watercourse's edge.

Brief updates include a second move for the River Nith in Ayrshire; coal reserves beneath the new channel have been calculated to outweigh the cost of another environmental river diversion. As much as it pains all involved with the 1st, this is always a factor, where economics still override the environment.

And, the Ythan project is nearing completion after 3 years. RRC

*Old Brook, NW England - a river in need of a helping hand!*



*Dunglas Island, Highland.  
New channel full of  
water complete with alder trees*

supported this project and will continue to publicise the results of what has been achieved.

### ***Northern Ireland***

Across the water, in Northern Ireland the opportunity to restore rivers remains limited and routine maintenance to cut back weed is often still deemed essential partly through pressure from local landowners. There is now an appreciation within the Rivers Agency that current practices need to be rethought. RRC has been liaising with them to help ensure that they are familiar with what is happening on the 'other side of the pond' in England and Wales in terms of maintenance procedures that take account of biodiversity issues.

### ***Scoping reports***

A scoping study was commissioned by the EA last year to assess the feasibility of developing a digital environmental river engineering design manual aimed at providing guidance and supporting information on the most widely used river enhancement techniques. Through literature reviews and consultation with people from a range of backgrounds the general consensus has been that such a tool would be very valuable to the practitioner and would also help to identify the gaps in our current knowledge. We, like you, wait with anticipation to see how this project develops.

The RRC believes that whenever possible river restoration should be considered in terms of both its implications for the wider catchment and impacts of catchment processes. It is now widely recognised that catchment scale issues are an integral part of any river and floodplain management. Within this framework RRC has completed a discussion paper about whether, at present, a truly catchment scale approach is being adopted and, if not, how far short existing projects fall of such an integrated approach. This study is currently being reviewed and will be available shortly on our website for comments.

### ***Getting to know our members***

#### ***Guest Speakers***

Last April, Amos Brandeis, the Manager and Chief Planner of the Alexander River Restoration Project in Israel, gave an inspiring presentation 'The Alexander River

Restoration Project'. This outlined a brave collaboration between Israel and its Palestinian neighbours to solve ecological problems posed by pollution in a river which flows from the Palestinian city of Nablus to the estuary of the Mediterranean Sea north of Tel-Aviv, in Israel.

In January this year, Professor Steve Ormerod from Cardiff University gave an equally informative presentation on 'A golden age of river restoration science?' based on an editorial written for Aquatic Conservation last December (see news and events page for reference). Both talks were well attended by RRC members.

#### ***Visits to demonstration sites***

This year the Centre is organising two field visits to the River Cole and River Skerne Restoration Demonstration Projects. These will be free for Members of the RRC. The Coleshill visit will be in May and the Skerne excursion will take place in August. If you are interested, please contact the Centre for details on the exact date and time.

We are now keen to co-ordinate speakers and site visits in the future at a variety of locations. If you have ideas for speakers or a suggestion for a visit then please get in touch with the Centre staff.

#### ***Support from our Corporate members***

RRC is a not-for-profit organisation. As such we rely on a combination of subscriptions from core-funders, corporate, organisation and individual members to ensure that we can continue to provide the level of service, information and expertise the Centre currently offers. We would therefore like to take this opportunity of saying thank you to all who currently help to fund RRC.

In particular, we would like to welcome three companies that have joined as corporate members over the last year:

the Cain Consultancy; Macafferri Ltd;  
and Halcrow Group Ltd

#### ***And Finally***

We are always interested to hear about what you are doing. If you have any news or events you would like to be included in the newsletter or think we can offer advice about a specific project then please contact either Jenny Mant or Martin Janes.

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# The Shopham Loop Restoration Project

**Mark Smith, Improvements Engineer, Sussex Area, Environment Agency provides an overview of the actions taken to restore this meander loop and comments on the potential benefits of the project**

## Introduction

Until the mid 1930s Shopham loop was a 1km long natural meander of the River Rother, supporting a wealth of wildlife and popular for fishing. Although a canal was created in 1795 that allowed the loop to be bypassed by barges, a lock system ensured that most of the flow used the loop. Following the closure of commercial canal operations in 1888, the rights of navigation on the canal were rescinded in law. From this point on, maintenance of the canal system also ceased and the lock gates fell into disrepair. Following their collapse the flow of the Rother increasingly took the preferential drainage route of the canal channel, gradually bypassing the loop.

Changes in land use practice in this sandstone catchment have caused increasing sediment inputs, accelerating the bypass process. During flood conditions, the loop became a sink for the large sediment loads, predominantly sand, within the river. The once habitat rich, meandering course of the river was finally isolated, filled with sand and replaced with a canalised, shorter section of channel supporting less diverse habitats.

The unplanned diversion of the full flow of the Rother down this canalised section of river has caused erosion damage to the canal infrastructure. The problems illustrated at Shopham loop are not unique, but occur throughout the catchment, with a cumulative effect that has had a profound impact, reducing the biodiversity and angling quality of the Rother, whilst increasing the overall maintenance liability. Shopham loop was identified as a high

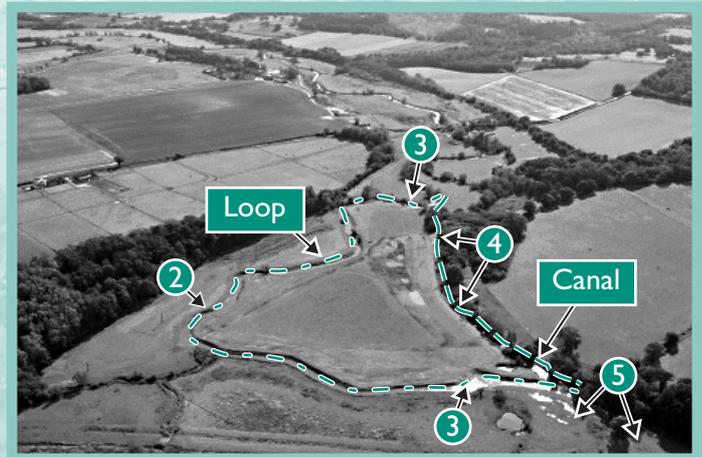
Loop prior to restoration



priority site in Environment Agency (EA) strategic plans as the restoration of the meander provided a pilot project illustrating how successful rehabilitation techniques can be when used to address wider catchment issues.

## Action taken

The EA employed a project team from the River Restoration Centre (RRC) consisting of Karen Fisher, Steve Darby and Richard Vivash to advise on the best solution to the problem. The Sussex Area EA managed the project and developed the detailed design, which was then executed by their in-house workforce.



To solve the problem the EA/RRC project team had to:

1. Identify the natural channel dimensions and bed profile through the loop in the current Rother catchment from geomorphological and hydraulic study.
2. Restore the loop to these dimensions tempering them with uncovered in-channel features (basic river archaeology using remnant channel features as a guide in favour of theoretical section design).
3. Fix the channel features at the upstream and downstream end of the system to prevent channel adjustment between the canalised section and the restored naturalised section (headward recession etc).
4. Restore the effect of the lock gates and system to prevent any passage of flow down the canal and divert all flows through the loop.
5. Lower sections of historically raised floodplain to encourage naturalised flows through the loop and its floodplain.

## Project features

The project provides a unique, documented case study of the restoration of an existing course of a river rather than cutting new courses in virgin soil.

To fix the restored channel, well-graded sandstone was compacted into the bed and part of the banks.

Loop being restored



# Project on the River Rother, West Sussex

At the downstream end this was formed into a mimic bedrock feature and at the upstream end a mimic riffle combined with a ford for farm traffic.

The project was designed to make the most sustainable use of materials. The sandstone, sourced from a quarry 3 miles from site, represented all the material imported to the site, a volume of 450m<sup>3</sup>. The 8000m<sup>3</sup> of silt removed from the loop during restoration was used to restore the canal embankments and to create a dam in the canal channel to replicate the old lock gates. To reuse this material and make these earth structures to EA specification, firm clay was made by repeatedly mixing and compacting proportions of 2/3 sand to 1/3 soft clay, this material being separated during initial excavation. This proved to be a highly effective and surprisingly quick method that reduced material costs and removed the need for any disposal.

The project was funded through a partnership of organisations formed of the EA, both riparian landowners, Defra (through Agri-environment grants) and the Sussex Downs Conservation Board. The capital cost of the restoration was approximately £90K.

## Project benefits

The following habitat enhancements should improve the local biodiversity and angling quality as:

- 1km of naturally functioning river course has been restored in lieu of 0.5km of straight canalised channel,
- Part of the canal channel has been retained as a backwater feature and flood refuge,
- 30ha of floodplain grassland has been restored and
- 11ha of wetland can now be better managed.



Completed flowing riffle/ford

Riffle being placed



Increasing the use of the floodplain will encourage silt deposition there rather than in the river and the system should now be maintenance free for 25+yrs.

The physical and ecological features of the restored site will be monitored for a minimum of three years to assess stabilisation, recovery and extent of re-naturalisation and provide information for wider use.

The project will be promoted both locally and to wider audiences as an example of multiple benefit, sustainable methods to solve these sorts of river habitat, infrastructure maintenance and siltation problems.

For further details email:  
[mark.smith@environment-agency.gov.uk](mailto:mark.smith@environment-agency.gov.uk)



# Sinderland Brook

## 1.8km of river and floodplain restoration integrated into a new housing development

*After many years of planning the restoration of Sinderland Brook and its floodplain construction started in July 2004. Kevin Skinner & Nick Haycock (Haycock Associates Limited) report on the objectives of this novel project and its progress to date.*

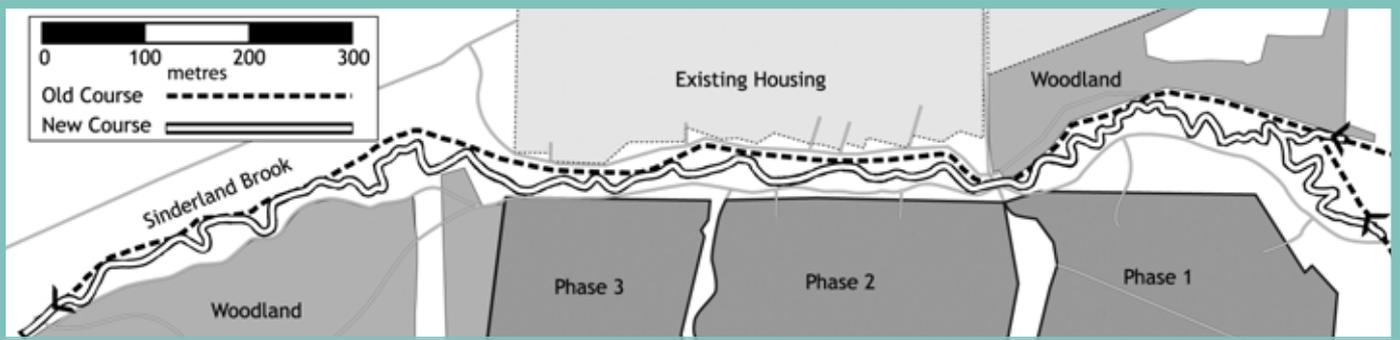


Figure 1: River Restoration Plan (August 2004)

### Background

Sinderland Brook near Broadheath, Altrincham, was channelised in the late 1960s by the local water authority. In the late 1990s a proposal was put forward by the National Trust to restore 1.8km of the brook, and its floodplain. This was to support the sale of a block of 28 hectares of land for housing development adjacent to the brook. The money raised by the sale will provide endowment funds for vital maintenance and restoration work for the rest of the Dunham Massey Estate. This was envisaged when the estate was bequeathed to the National Trust.

In addition to the restoration scheme, well connected greenways and wildlife corridors as part of the Sustainable Urban Drainage System (SUDS) will be incorporated into the Taylor Woodrow (Bryant Homes)/ Redrow housing development. The two developers have been supportive of the scheme from the onset. At the far west of the development 7 hectares of community woodland will also be planted forming further conservation and recreational benefits to the area. This article will highlight the benefits of the scheme in addition to the construction progress of the river and floodplain restoration (see Figure 1) as well as the wildlife corridors to date (Winter 2004). The National Trust has largely funded the restoration work but additional money has come from Defra and the Environment Agency.

### River and floodplain in restoration

The restoration of Sinderland Brook and its floodplain will have a multitude of benefits. One of the main objectives is to transform the existing channelised watercourse, which possesses only a limited floodplain,

to a diverse meandering river. Accompanying the river restoration is the creation of a new valley form at a lower elevation that ranges from 30-60m wide. The newly constructed river will be between 30-50% narrower than the current channelised brook to enable more frequent interaction between the river and its floodplain. This will help restore the functioning of the river with deposition of fine sediment expected to occur on the floodplain in higher flow events. The geomorphological design of the river is broadly based on the historical channel form with the floodplain design being based on downstream reference reaches. No bank protection work will be used over the length of the restored reach. This will enable the river to freely adjust its planform and will thus be sustainable in the long-term. Intervention will only occur if erosion threatens the limits of the extended floodplain or serious instability is identified.

The creation of a new wide floodplain will have significant flood protection benefits. Currently, there is a rapid response to any rainfall event since the upstream drainage area of around 3km<sup>2</sup> is largely runoff from Altrincham. The construction of the new valley will provide a large increase in floodplain storage area that

Plate 1: Newly cut channel and floodplain



will cause a reduction in the flood pulse. This will also dramatically increase flood protection to the existing properties (currently Q35 raised to +Q70) while providing a very high level of protection for the new housing development (Q100 + 20%). Uniquely, the National Trust has adopted higher flood protection standards than Policy Planning Guidance (PPG25) to allow for climate change predications based in UKCIP-2 model.

A further key benefit is to the habitat. The physically diverse channel and riparian corridor will provide new and varied habitats to Sinderland Brook that previously had not existed in its former channelised state. This should benefit fish, invertebrates, mammals and birds. A key objective is to provide suitable habitat for nesting kingfishers.

Finally, the restoration work will provide significant aesthetic and recreational benefits for the local public. The area is already used for this purpose and the opening up of a large area of land will provide a valuable resource.

### *Sustainable Urban Drainage System*

A wildlife corridor will be developed between Phase 1 and 2 of the housing development as part of the Sustainable Urban Drainage System (SUDS). The inclusion of urban attenuation ponds locally to the development will also enable a degree of groundwater regulation on the site and further extend the use of infiltration attenuation techniques within the built environment. A series of open swales will be developed to channel surface runoff into the riparian corridor of the newly restored river. This corridor will have a beneficial role in habitat creation in its own right particularly following selective planting in this area.

### *Progress to date*

#### *River and floodplain*

During the summer of 2004 construction of the first (upstream) phase of the scheme proceeded intermittently. Bad weather hampered progress and thus only 420m of channel and floodplain have been constructed to date (Plates 1-2). Work will resume in April 2005 and will be completed by October 2005.

*Plate 2: Current channelised course and extent of construction (October 2004)*



No connection has yet been made between the old channelised course and the newly restored channel (Plate 2). This should provide the opportunity for vegetation to grow in the new valley form prior to connection later this year.

### *SUDS*

The work on the wildlife corridor was undertaken between October and December 2004. The bulk of the dig has now been completed with only the confluence of the wildlife corridor into the floodplain of the river restoration scheme remaining to be cut. This will be performed early in the construction phase in 2005.

### *Summary*

The novel approach used for the restoration of the river and floodplain of Sinderland Brook could be used in other areas where housing to date has not been considered. The scheme will provide geomorphological, flood defence, ecological and recreational benefits and thus a truly integrative approach has been adopted.

### *Acknowledged Partners*

The development partnership comprises The National Trust, Redrow Homes, Taylor Woodrow (Bryant). The rivers consultant team has been Haycock Associates Ltd., Mouchel-Parkman (Wigan) and TEP (Warrington).

#### *Further information:*

<http://www.stamfordbrook.co.uk/>  
<http://www.haycock-associates.co.uk>

*All photographs and figures appear in this article courtesy of Haycock Associates Limited*

*60m corridor soil stripped (August 2004)*



*Corridor excavated and low flow channel form established. Note current brook is not connected. (October 2004)*



# News and Events

## Conferences

### *River Basin Management – Progress towards implementation of the Water Framework Directive*

*Budapest, Hungary, 19th – 20th May 2005*

Visit [www.riverbasinmanagement2005.com](http://www.riverbasinmanagement2005.com)  
or email [conferences@ice.org.uk](mailto:conferences@ice.org.uk)

### *Flood and Coastal Management Conference*

*York, 5th – 7th July 2005*

Visit [www.defra.gov.uk/enviro/fcd/conference/conference.htm](http://www.defra.gov.uk/enviro/fcd/conference/conference.htm)

### *World Conference on Ecological Restoration*

*Zaragoza, Spain, 12th – 18th September 2005*

Visit [www.ecologicalrestoration.net](http://www.ecologicalrestoration.net)  
or email [secretariat@ecologicalrestoration.net](mailto:secretariat@ecologicalrestoration.net)

### *International Conference on Urban River Rehabilitation*

*Dresden, 21st – 23rd September 2005*

Visit [www.tu-dresden.de/urban-rivers-conference](http://www.tu-dresden.de/urban-rivers-conference)

### *International LIFE-Symposium Riverine Landscapes Restoration, Flood Protection, Conservation*

*Tyrol, Austria, 26th – 29th September 2005*

Visit [www.tiroler-lech.at](http://www.tiroler-lech.at)

### *IFM Conference 2005 Fisheries on the Edge*

*Salford Quays, Greater Manchester, 15th – 17th November 2005,*

Visit [www.ifm.org.uk](http://www.ifm.org.uk)

## Book Review

By Richard Vivash

### *Land Drainage from Field to Sea*

Clayton 1919

Republished Logaston Press 2004

ISBN 1 904396 28 3

Price £15.00

The republication of Clayton's historic book offers a unique opportunity for modern day river managers to gain first hand knowledge and understanding of the policies and practices that sustained decades of land drainage and flood defence work to help render the UK's fertile lands fully productive in feeding the nation.

In the book dedicated to Clayton's memory, we are wisely reminded that 'those who show idle respect for the past are said to be poor guardians of the future'.

This, of course is an appeal to those who, in pursuit of modern day agri-environmental goals, global markets etc, would undo much of what has been achieved. The book cannot fail to foster a pause for thought as well as better informed judgments on the way ahead. Clayton was not without vision. River Restoration practitioners will empathize with his philosophies for 'planning at a catchment scale' as well as his view that 'part at least of floodwaters..... should be sent to earth'.

## Useful Reference

*Ormerod, S.J. (2004) A golden age of river restoration science?*

*Aquatic. Conserv. Mar. Freshw. Ecosyst. 14: 543-54*

# Unrivalled

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protection at the water's edge. Our specialist designers and engineers will be happy to help you develop the right solution.

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Pavements



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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.

