# River Restoration NEWS

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*Newsletter of the RIVER RESTORATION CENTRE*



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# Turning Back the Clock ...in the New Forest


Pages 2-3


**Operating Hatches**


Pages 6-7


**Restoring Scotland's Waters**


Page 4

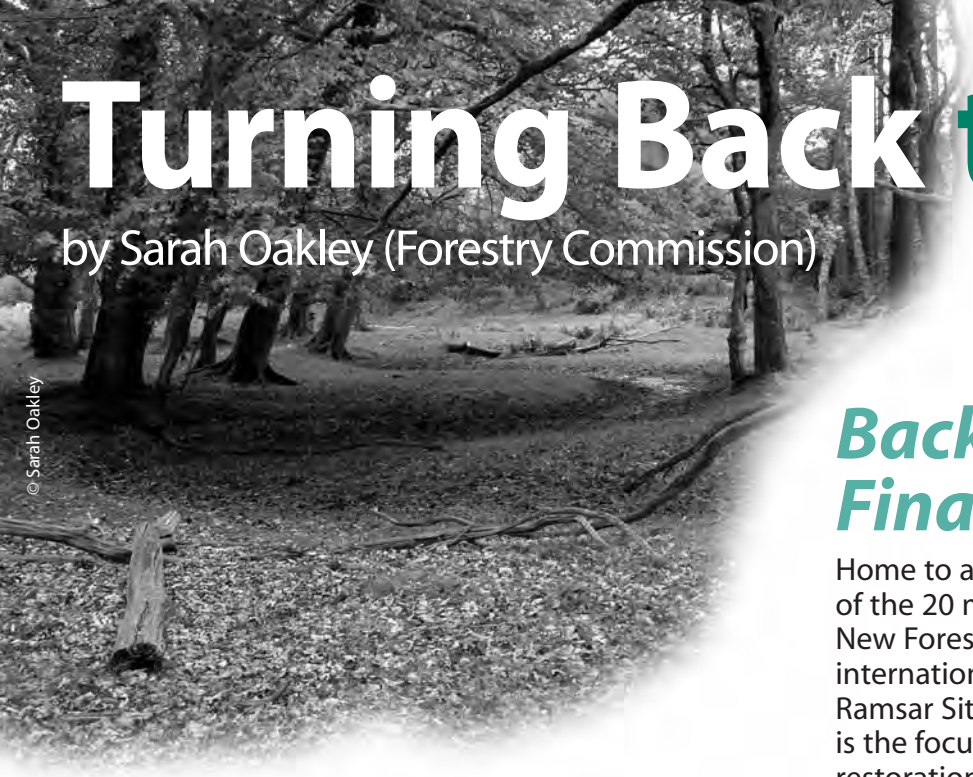

**CIRIA's Guidance for Culvert Design**


Pages 4-5


**WTT Awards • LRAP • Plus News & Events**

# Turning Back the Clock

by Sarah Oakley (Forestry Commission)



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## Research and consultation

The rich history of the New Forest provides a vital resource during the initial planning stages. Driver's map of 1789 provides valuable clues to the original lines of many watercourses, whilst LiDAR (Light Detection And Ranging) uses remote sensing technology to reveal the historic environment, producing detailed 3D models of the terrain by 'seeing through' the tree cover to reveal the hidden topography below - in this context, the presence of lost meanders and spoil banks that provide evidence of drainage works.

A combination of desk-based research and fieldwork culminate in the development of a site restoration proposal, which is presented on site to stakeholders for their feedback and approval (in the New Forest this crucially includes the Verderers and the Commoners Defence Association). Opinions as to the value of debris dams and the seasonal inundation of floodplains can vary - achieving an agreement can provide a good test of negotiation skills. The size of the projects now being undertaken in the New Forest is testimony to the trust now placed in the Forestry Commission, as a result of their track record of effective habitat restoration. Crucial to this trust is an ongoing commitment to monitor, revisit and review sites if things fail.

## Background - the Final 4,000 Project

Home to a wealth of rare fauna and flora, many of the 20 million day visitors that flock to the New Forest annually are unaware that this internationally designated site (a SAC, SPA and Ramsar Site as well as a SSSI and National Park) is the focus of the biggest programme of habitat restoration being undertaken in the UK today. Over the past 150 years, many of the wetland habitats were drained. Forest streams were re-routed, straightened and deepened, resulting in the loss of interaction with their floodplains. Drains cut into these shallow forest soils (and at other locations in the Forest into the peats of the valley mires) have continued to erode, cutting deep scars into the landscape; washing thousands of tonnes of sediment downstream.

The work focuses on healing these wounds through restoring the original meandering course of streams on the open forest. By creating shallower channels, the adjacent floodplains are being restored with their floristically rich wet grasslands (known locally as 'lawns'), and by felling encroaching scrub and secondary woodland the project is opening up other lawns which have, over time, gradually been lost to trees. The current programme - the Final 4,000 Project - builds on the huge successes of two EU LIFE Programmes and the New Forest Pathfinder Project. It is a partnership project, set up in 2008 by the New Forest National Park Authority, the Forestry Commission and Natural England, with the Environment Agency formally coming on board in 2009.

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It is scheduled to run from 2008 to 2017, with the aim of delivering upwards of £600,000 of habitat restoration works in the New Forest each year during that time. The objective is to secure the SSSI condition status as recovering or favourable for the 'final 4000' hectares of SSSI currently assessed as being in unfavourable condition.

# in the New Forest


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## Delivery

The biggest of the three sites tackled during the summer of 2009 was Warwickslade, where the original meandering course of the stream was lost when the Warwickslade Cutting was dug in the 1850s. Forming a perfectly straight line on today's Ordnance Survey map, the Cutting runs for almost two and a half kilometres, slicing through ancient and ornamental woodlands and lawn habitats.

The work on the ground began in June, when ground conditions were at their driest. First, the line of the still-visible original meanders was carefully scraped out (in some cases these had to be linked together by short sections of 'designed' channel, where the original course had been lost to spoil heaps, crossing points or the drain itself). Immediately prior to the meanders becoming 'live', some of the substrate (gravels, sediments, woody debris) from the drain was transferred across to the restored channel, to help the faunal colonisation process. Impermeable clay plugs were used to divert the water off the line of the drain and into the newly-restored meanders. The redundant drain was then infilled, largely with locally-dug gravels known as hoggin, with clay plugs set into the banks at regular intervals to consolidate the infill.


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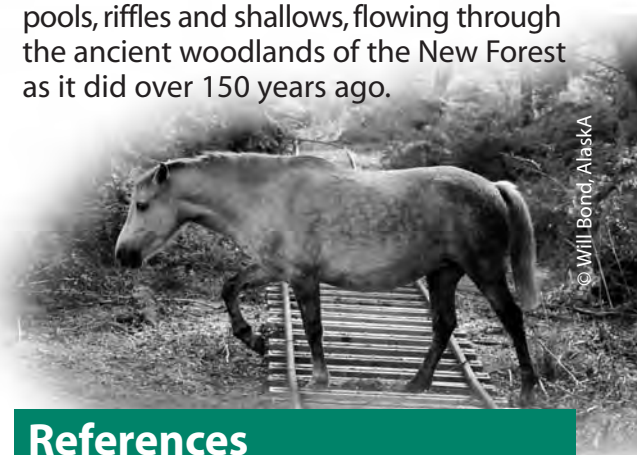
## The contractor's eye view

The successful contractor, Alaska Environmental Limited, has a strong track record in sensitive restoration projects on designated sites. Will Bond, Director, gives an insight into how this job became a little different from the rest...

"We see all manner of jobs to be done and in most cases conventional methods are the most appropriate, or inevitable due to timing or other constraints. But every now and then one is struck by the possibilities to do something better. I took one look at Warwickslade Cutting and reckoned that if ever a site was suited to a light railway this was it; 2.5km long with only one bend and a gentle gradient all the way. In five weeks we designed and built a tramway which was capable of delivering the last 8,000 tonnes of infill material to Warwickslade. The potential advantages included greatly reducing the impact of hauling so much material through a sensitive site, and slashing the fossil fuel consumption of the operation. The tramway exceeded expectations on both fronts, but within the time available was only ever a prototype on field trials. Encouraged by the performance at Warwickslade we are busy developing a more mature and confident version for the future."

## Trial by water

This winter has given Warwickslade the biggest test of all - persistent high rainfall in an area where the watercourses are notoriously 'flashy'. The transformation of the landscape was phenomenal. The desired floodplain inundation came and went, the floodwaters pointing out the levels more comprehensively than any laser system. And the verdict? The forest had one or two surprises up its sleeve, with hitherto unnoticed runoff channels seeking out the lost drain in vain, but these are easily remedied. The end result is a sinuous, meandering channel with deep pools, riffles and shallows, flowing through the ancient woodlands of the New Forest as it did over 150 years ago.


© Will Bond, AlaskA


## References

Crow, P (2008) *Surveys of woodland using LiDAR*


For more photos of the project, go to: **www.geograph.org.uk/photo/1483193**

For details of past LIFE restoration projects in the New Forest, visit **www.newforestlife.org.uk**

Please contact Sarah Oakley (Forestry Commission) for more information (**sarah.oakley@forestry.gsi.gov.uk**)

# RRC Message Board

## ANNUAL CONFERENCE

**RRCentre 11th Annual Networking Conference:**
14th - 16th April
@ University of York.

The provisional programme and a booking form are available online.
http://www.therrc.co.uk/rrc_conferences.php

## TECHNICAL WORKSHOP

**RRC Technical Workshop Module 1:**
8th - 9th June
@ Britannia Hotel, Manchester

Information and a booking form are now available online.

http://www.therrc.co.uk/rrc_news.php

## SITE VISITS

**RRC Guided Site Visits:**

To be confirmed. For more information:
http://www.therrc.co.uk/rrc_news.php

If you have a suggestion for a future visit please contact Ian Brown at the centre:
rrc@therrc.co.uk

## STAFF

**We would like to welcome James Holloway** to the RRC in the position of Project Officer.

James' background is in ecology, and he completed a Cranfield MSc in Environmental Water Management. He is working on some of our restoration projects.

## FACEBOOK

**Follow us on Facebook** by searching for the 'River Restoration Centre'. 2010 has so far seen the addition of an RRC blog, videos & interesting links.

Find us on Facebook®
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# LAUNCH OF NEW CULV

**Culverts are one of the most common types of draina many sectors in the UK. There are tens of thousands them over fifty years old and requiring significant repai of new culverts is discouraged, there are situations wh significant numbers of new culverts are still being des these represent a huge collection of assets which ha**

**To aid this process CIRIA will be launching updated culverts early in March 2010 available to download f**

**Ben Kidd (Project Manager, CIRIA) gives an overvi including details of a daylighting case stu**



Case study

## River Pi

A culvert daylightin Centre on the River found to be inadeq circular brick culver with a number of b culvert. Downstrea and sections of con divert the river in o preparation; ***Figure*** flood risk as well as


## Background setting

A culvert provides the means of allowing infrastructure to cross a watercourse. In service a well-designed culvert may require little attention from an asset manager other than routine inspection and maintenance. However, there are thousands of existing culverts across the UK, many designed for conditions which have been significantly altered by urban development, climate change and concern about the quality of the aquatic environment. Problems of decaying structural fabric, sedimentation, blockage by debris and inadequate capacity present an asset manager with a constant demand for assessment and repair. In addition there are increasing environmental pressures, driven by legislation such as the Water Framework Directive (WFD).

# ERT DESIGN AND OPERATION GUIDE

**age infrastructure and are widely used by of culverts currently in operation, many of ir or replacement. Although the construction here there may be no viable alternative, so signed and constructed each year. Together, ave to be managed to achieve best value.**

**guidance on the design and operation of free from CIRIA's website (www.ciria.org).**

**ew of the content of the new guidance, dy on the River Pinn in Harrow.**


## nn culvert daylighting

ng scheme has been completed at Harrow Arts r Pinn in South East England, where a culvert was uate for flood flows. The culvert in question was a t, approximately 1m in diameter and 170m long, ends. ***Figure1*** shows demolition of the brick-lined m of this culvert were several culverted crossings crete lined channel. The chosen solution was to pen channel on a new route ( ***Figure 2*** – during ***e 3*** – as-constructed). This provided a reduction in s significant improvements to habitat (***Figure 4***).


## CIRIA guidance

It is in this context that the Culvert Design and Operation Guide (CDOG) has been prepared to replace the Culvert Design Guide published in 1997. CDOG adopts a whole-life approach to the design and operation of culverts, with a focus on asset management, reflecting the significant changes that have occurred over the past 10 to 15 years. CDOG also addresses the management of culverts in the context of both the drainage basin in which they sit and the infrastructure of which they form part .

There is no doubt that the removal of a culvert and the restoration of a natural stream will achieve improved ecological status, but in many cases this will not be an option (e.g. in the case of most road and railway culverts). Nevertheless, there will be strong pressure to include ecological improvement works in any culvert rehabilitation scheme and this is an area that is not covered in current guidance. The WFD will provide a basis for objections to any new culverts, so the CDOG provides guidance for infrastructure operators and developers to enable them to produce sound designs with appropriate mitigation measures where a culvert is the only answer. CDOG also provides guidance on how ecological enhancements can be made and case studies are presented.


## For further information

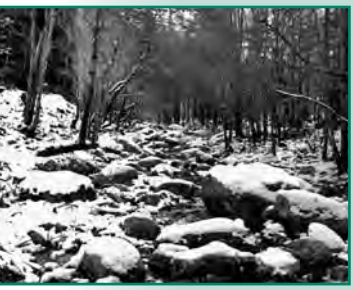
**Please contact Ben Kidd (ben.kidd@ciria.org)**

Hard copies of the report can be obtained by contacting CIRIA directly on 020 7549 3300 or by email: **enquiries@ciria.org**

# Restoring Scotland's Waters

## SEPA Restoration Fund

*Over the years the water environment in Scotland has been subject to impact from various physical pressures, with the result that many rivers, lochs, wetlands and coast lines are now a shadow of what they once were.* ***Julie Tuck (SEPA)*** *addresses how the Scottish Environment Protection Agency (SEPA) has received funding from the Scottish Government to restore and enhance the morphological condition of Scotland's intrinsic natural assets.*



### Examples of projects that could be considered for funding are:

- Restoring natural processes in rivers or lochs;
- Engineering degraded rivers to restore natural profiles by, for for example, recreating meanders;
- Removing or modifying man-made barriers to improve fish passage, flow and sediment transport;
- Restoring floodplains, coastal intertidal zones and wetlands;
- Scoping studies to assess the cost of physical restoration works;
- Controlling non-native invasive riparian and instream plant species

### Funding criteria for prospective applicants

SEPA are keen to see improvements delivered through partnership-working with external stakeholders taking forward projects on the ground. SEPA will also lead on projects at a strategic level. Prospective applicants are asked to consider the following criteria when applying for funding:

- Every project must aim to deliver physical improvements to the water environment thus contributing to the Water Framework Directive objectives set out in Scotland's river basin management plans.
- The project must aim to improve the waterbody's current condition by tackling the physical pressures affecting it.
- Where possible, the project should also deliver a wider range of environmental, social and economic benefits.

### As it stands

The Restoration Fund will gradually increase towards £1m in 2011-2012 and is then expected to continue at £1m. It has so far awarded 39 projects since 2008 and looks to substantially increase this in the coming years.

## Find out more

Further details about the fund, successful projects and the application process can be found on SEPA's website.

**www.sepa.org.uk/water/restoration_fund.aspx**



# Managing Wat

Lowland rivers in the UK are heavily impacted by water level control structures constructed for various purposes, including milling, navigation, water supply and agriculture.

One of the outputs from the STrategic REstoration And Management (STREAM) project is guidance on the development of Hatch Operating Protocols (HOPs) to establish more integrated operation of structures on the River Avon. Having realised that few outside Wiltshire know what a hatch is, these have been more recently termed "Structural Operating Protocols".

**Joanna Eyquem (Royal Haskoning)** takes a break from her adventures in Montreal, Canada, to explain the basis of the operating protocol approach.

## Why do we need operating protocols?

The protocol approach provides a mechanism for reviewing if a structure is needed, the objectives of its operation and how it should be operated to meet these objectives. The aim is to reach a voluntary consensus with all interested parties and document this in a clear, written protocol that makes the agreed approach transparent to all. In some cases it may be that "Business As Usual" is actually best for both the river habitats and people involved. However, this is not the case in many situations and the development of a written operating protocol provides a focus for improving water level management in the future.

## Adopting a staged approach

Based on experience gained during the development of seven pilot operating protocols for the STREAM project, a generic approach has been developed in the form of an easy to follow flow chart. The key stages involved are:

**Stage 1**: Establishment of baseline conditions
**Stage 2**: Development of operating protocol
**Stage 3**: Agreement and dissemination
**Stage 4**: Evaluation

Consultation, negotiation (and time!) are vital in order to identify, discuss and agree the issues driving operation at a site with all interested parties involved. The views of Natural England are also instrumental in identifying where changes in operation may be desirable to benefit designated sites and habitats.

# er Level Control Structures? HOP to it!!

## Alternative solutions

The protocol development process is based on the structure being required for a specific function and it being physically suited to this function. If, following completion of Stage 1, it is considered that a specific structure now serves no function, removal can be considered. However in some cases, whilst the original function may no longer be necessary, removal may result in current aspirations such as a water level management being negatively affected. In such cases structural modification may be more appropriate.




## Changes in structural operation can provide beneficial results!

Whilst the development of structural operating protocols may appear "dull", say in comparison to installation of riffles, the results of changes in operation can be equally beneficial to the site (**Figures 1a-1d**).

In 2006, Iron Hatches on the River Nadder, was largely closed creating impounded conditions upstream (**Figure 1a** and **1b**). In 2007, it was agreed that the hatches would be opened as part of restoration works, resulting in increased flow velocities, lower water levels and habitat suitable for the growth of water crowfoot (**Figure 1c** and **1d**;). The operating protocol approach is being used within the Avon and Wensum catchments and it is hoped it will be applied in other catchments in future.







**Iron Hatches location**




**Information**

Detailed information, templates and practical guidance for completion of each of the key stages is provided in the Best Practice Guidance section on the STREAM website;
**http://www.streamlife.org.uk/resources/publications/**

**Please contact Joanna Eyquem** for any further enquiries (**j.eyquem@royalhaskoning.com**).

# 2009 WTT Conservation Awards recognises restoration

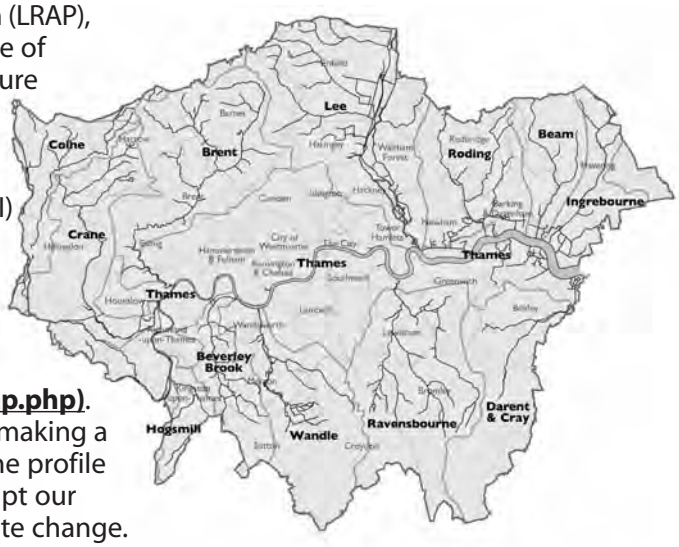
The diversity of the problems faced and overcome made this year's Wild Trout Trust awards extremely competitive. The river Mel working group won the amateur category for their active role in restoration activities. Volunteer numbers increased by 65% after a campaign helped raise awareness of the intention to enhance the characteristic habitats, plants and animals of the river. This enabled two village projects to run simultaneously and now over 550 metres of river have been restored since 2006. The group have also provided ecological-based activities to Melbourn Village College and engaged local students in practical river restoration.

The Botley Mills Fishpass Project on the Hamble was recognised as the Professional Category winner. It was highly commended for the considerable effort expended on solving a plethora of logistical problems. The Project's novel approach provided an aesthetically pleasing solution on a chalk stream benefiting a range of fish species.

For the full article, see: **http://www.therrc.co.uk/rrc_news.php**

# LRAP scoops prestigious RTPI award

The London Rivers Action Plan (LRAP), which aims to raise the profile of river restoration as a key feature of sustainable development, was the winner of the Climate Change category at the Royal Town Planning Institute (RTPI) awards ceremony, held in London in January 2010.




The RRC hosts the LRAP map of river projects online (**http://www.therrc.co.uk/lrap.php**). The initiative was seen to be making a real contribution to raising the profile of planning that helps to adapt our urban environments to climate change.

Project partners include the Environment Agency, the Greater London Authority, WWF-UK, Natural England, the Greater London Authority, Thames River Restoration Trust and the River Restoration Centre. Acknowledgement should also go to Rob & Rhoda Burns of Drawing Attention and Roger Dawkins who were instrumental in helping the RRC deliver the LRAP document and interactive online mapping system.

Royal Town Planning Institute (RTPI) awards:
**http://www.rtpi.org.uk/item/420/23/5/3**

To submit a new or completed project:
**http://www.therrc.co.uk/register_your_project_london.doc**

# Events

**FBA 2nd Annual Summit:**
12th - 15th April
in Windermere, Cumbria.
http://www.fba.org.uk

**CIWEM Water and Environment 2010 Conference:**
28th - 29th April
@ Olympia Conference Centre, London.
http://www.ciwem.org/events/annual_conference

**Ballinderry River Enhancement Association and ARTS Seminar:**
19th - 20th May
in Cookstown, Northern Ireland.
Call for speakers.
http://www.associationofriverstrusts.org.uk

**USA Stream Restoration Short Courses:**
24th May - 12th August
in various locations.
mailto:
kpodolak@berkeley.edu

**British Hydrological Society International Symposium:**
19th - 23rd July
@ University of Newcastle.
http://www.ceg.ncl.ac.uk/bhs2010

**The Conservation and Management of Rivers - 20 Years on:**
6th to 9th September
@ University of York.
http://www.jncc.gov.uk/page-4902

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 Management Board.**

Environment Agency · NATURAL ENGLAND · SEPA Scottish Environment Protection Agency · RIVERS Agency · Scottish Natural Heritage All of nature for all of Scotland · NIEA Northern Ireland Environment Agency www.ni-environment.gov.uk

***the River Restoration Centre, Building 53, Cranfield University, Cranfield, Bedfordshire MK43 0AL***

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