River Restoration NEWS

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Newsletter of the RIVER RESTORATION CENTRE

Tel/Fax: 01234 752979 Email: rrc@theRRC.co.uk

CIWEM Living Wetlands Award 2009

The CIWEM Living Wetlands Award was presented at the World Wetlands Day Conference in London on February 10th 2009. The Award was co-founded with the RSPB in 2002/2003 and recognises multi-functional projects that demonstrate the sustainable use of wetland habitats.

Success for STREAM

The 2009 winner was the STREAM project (STrategic REstoration And Management of the River Avon) and the award was presented to Jenny Wheeldon, STREAM's Project Manager. The STREAM project is a £1 million, 4-year project centred on the River Avon and the Avon Valley in Wiltshire and Hampshire. Extensive land drainage had changed the local habitat and broken the links between the river and its floodplains. STREAM is restoring 7 km of river in the River Avon SAC to a more sustainable size and shape, improving its ability to support important aquatic habitats and species such as Atlantic salmon, lamprey and chalk river plants.

Pond dipping at a STREAM open day, Dockens Water

The project developed a cost effective monitoring protocol to help assess how successful restoration was against physical and biological targets. Initial indications are that in-channel vegetation growth, physical habitat diversity and fish target species numbers have all increased as a result of the restoration works.

Continues on Page 2

Inside this issue

Continues from Page 1

Management of the lower River Avon SAC is intimately linked with the management of the grazing marshes of the Avon Valley SPA. Breeding waders and wintering birds are dependent on the creation of suitable conditions by controlling and retaining water on the floodplain at key times. Conditions in the Avon Valley are currently unfavourable for these birds, largely as a result of neglect of the watercourse network and inappropriate water level management. Weed cutting, management of structures and natural variations in flow have had an important influence on water levels in the river and its valley.

One of six adult Atlantic salmon recorded after restoration at the Seven Hatches site

Balancing interests

In order to integrate management of water levels in the valley and the needs of migrating fish populations in the River Avon, STREAM developed two tools suitable for areas where there are potential conflicts between river and wetland management. The first uses existing fishery data to generate colour coded maps, which can then be used to assess the potential impact on fish of measures such as ditch reinstatement and new structures. The second is guidance on developing hatch operating protocols for structures that balance a number of river and floodplain interests.

The STREAM project also runs an extensive programme of events and communication activities including site workshops, seminars for landowners and government agencies, community events and open days. STREAM works jointly with the Living River project on a number of community events, and 5000 adults and children have become involved in education and river events through the project.

The runner-up

The commended project entry went to the Cumbria Wildlife Trust for the Foulshaw Moss restoration project. The Foulshaw Moss reserve was purchased by Cumbria Wildlife Trust in 1998, and was initially in poor condition due to past forestry, drainage, scrub invasion and peat cutting activities. The project aims to restore the 350 hectares of lowland raised mire or peat bog at the reserve so that it will once again provide habitat for a rich and interesting range of wildlife.

Since purchasing the reserve the Trust has removed 200 hectares of conifers and blocked drains, bringing the water table back to the ground surface and re-starting the process of bog growth. In addition, scrub has been controlled and rhododendron cleared, with boundary fences repaired to enable grazing on the reserve. Wildlife has responded rapidly, with sphagnum mosses growing vigorously and rare species such as the large heath butterfly and adder spreading throughout the reserve. In addition, some smaller areas of oak woodland have been restored and a new reedbed area created, with further support for wildlife populations such as red squirrels, barn owls and invertebrates. A number of new species have arrived on the reserve, such as snipe, teal, hen harrier, osprey and hobby.

Community involvement has been encouraged through a programme of work parties, guided walks and reserve open days. New paths and walkways have been created to allow visitor access all year round, and viewing towers and hides have been constructed. The site now has interpretation signs, marked trails and species and habitat information. It is used by schools and colleges for educational visits and volunteer work parties regularly assist with practical conservation work on the site.

Dams at Foulshaw Moss Reserve, January 2008

London's rivers to be reborn

In January 2009 the London Rivers Action Plan (LRAP) was launched. Dave Webb (Environment Agency), Robert Oates (Thames Rivers Restoration Trust) and Jenny Mant (RRC) report on the plan and the launch.

Open water providing space to manage flood risk and access to nature

River quality in the River Thames has improved greatly since the industrial revolution. Nonetheless, many of its 600km of tributaries still suffer from the 20th century legacy of confining rivers in heavily engineered concrete channels, seen at the time as the most efficient way to combat flooding and allow rapid urban development and population growth under a scenario with limited/no spatial planning. The LRAP provides a forum for identifying river stretches that can be restored to a more natural state, helping to create a more sustainable City by reducing flood risk in a more environmentally acceptable way.

The plan supports London's biodiversity targets to restore 15km of Thames tributaries by 2015. One example of the positive benefits of river restoration is in Greenwich, southeast London, where a section of the River Quaggy has been removed from its underground culvert into a landscaped park, creating wetlands with cycleways, footpaths and open spaces. It has become a valuable community asset and a haven for wildlife including kingfishers and several types of dragonfly; this more natural approach has also reduced the flood risk to neighbouring properties.

The plan also feeds into the Environment Agency's recently completed Draft River Basin Management Plan (RBMP) for the Thames River Basin District, which under the WFD identifies opportunities for improving rivers and wetlands. The Draft RBMPs for public consultation can be found at: **www.environment-agency.gov.uk/research/planning/33106.aspx**.

The plan was launched on 8th January 2009 at City Hall overlooking the Thames. The launch was attended by over 100 people from a range of backgrounds and organisations and received much favourable press coverage both locally and nationally. It began with an address from Isabel Dedring, Director of Environmental Policy for the Mayor of London, in which she highlighted that '*the plan will deliver aesthetic benefits but will also help us prepare for our changing climate. Restoring our rivers will play a part in making London a more attractive place for people to come to live and invest.*"

Dave Webb, the Project Manager, added that from an Environment Agency perspective they were '*striving to improve London's most damaged rivers and at the same time create important habitats to improve every Londoner's life with new open spaces whilst ensuring flood risk to homes and businesses is reduced; another compelling reason to take care of our environment.*'

The main emphasis of the LRAP is to provide an updateable information resource that identifies restoration opportunities together with completed best practice examples. An interactive website has been developed, maintained by the River Restoration Centre (**www.therrc.co.uk/lrap.php**). A demonstration of the website by the RRC followed and Robert Oates brought home the salient point that 'in times of economic stress there is a greater need for free riverside recreation close to people's homes that can bring nature closer to their door step, which this plan will help to deliver.'

This plan will be instrumental to bringing and targeting more private and national funds to achieve its goals for the benefit of all Londoners and the wildlife that lives along the river corridor. Already, one of the projects highlighted in the plan, the Mayes Brook Improvement Project in Barking, East London, has received promises of nearly £1m from public and private sources. The plan aspires to help a range of organisations to work together to raise project profiles and achieve improved rivers.

Urban regeneration allowing better access to nature

The LRAP is a partnership project supported by the Greater London Authority, Environment Agency, Natural England, the Thames Rivers Restoration Trust, London Wildlife Trust, the River Restoration Centre and WWF UK.

For further information or to comment please contact the River Restoration Centre.

Effects of wooden upstrea

on benthic macro-invertebrates a

In 2007 Gopsall Fishing Club on the River Sence were awarded the Wild Trout Trust's Conservation Aw judges welcomed an "ambitious" monitoring program for assessing the effects of the restoration method with the Environment Agency, the University of Derby and the Wild Trout Trust. Mark Owen rep

The Sence is situated in North West Leicestershire and is a typical lowland river having been modified in the past to accommodate land drainage, flood defence measures, use of water to power mills and the construction of road and rail. In recent times the river suffered from the effects of open cast coal mining and extraction of clay. The geology consists of calcareous boulder clay under and overlying sand and gravel, which overlie the Triassic Mercia Mudstone Group. The present agricultural use in the valley is mixed dairy and arable.

In the winter of 2005/06 the club cleared a 700m stretch that had been historically straightened during the construction of a railway line and which was heavily tunnelled, to create a dappled shade effect. In addition, the left hand bank had been poached by cattle and this was fenced off in May 2006.

In June 2007 baseline invertebrate sampling using 3-minute kick sampling by the club took place together with a baseline electro-fish survey carried out by Environment Agency officers. Subsequently 6 pairs of upstream V groynes were inserted (sites 2-8) as recommended by the Wild Trout Trust's *The Wild Trout Trust Survival Guide: Habitat and Fishery Management,* together with an upstream control site (site 1). Invertebrate sampling then continued monthly over a 12 month period alternately below the groynes with the control sampled monthly. The results together with water chemistry were analysed using RIVPACS software. In June 2007 this section was electro-fish surveyed again.

External Factors

During the 12 month survey otters (*Lutra lutra*) were recorded as present for the first time in 5 years of monitoring. Incidents of point source pollution from slurry leaks were recorded through groyne sites 3-7 but not through sites 1 & 2. Upstream agricultural practices changed from livestock causing severe bank erosion to arable with 4-6m bank margins.

V groynes at site 7

Discussion of results

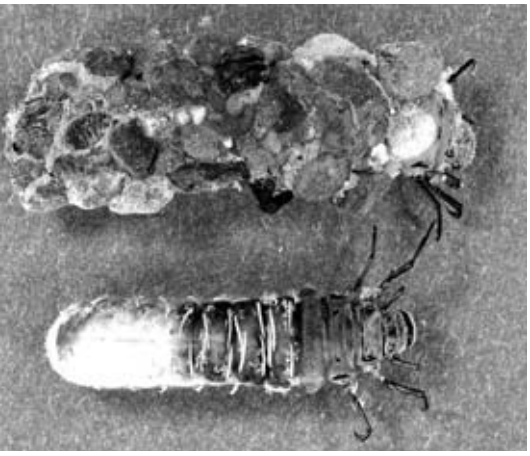
EPT (Ephemeroptera+Plecoptera+ Trichoptera) taxa richness results found that as a result of retention of coarse particulate organic matter by their logs, there was a noticeable increase in Trichoptera abundance in the first year. In this study there was a small increase in Trichoptera recorded across all the sites except site 7, where numbers decreased. The biggest increase was seen at site 5 where numbers increased by 8 times (in line with Gore *et al.* 2001 regarding depth). The most notable increase was seen in Ephemeroptera; the control site numbers increased from 20 to 100 individuals but numbers recorded at sites 3, 5 & 7 were consistently greater than 300 despite site 3 recording none present at the baseline, and despite the pollution incidents previously noted.

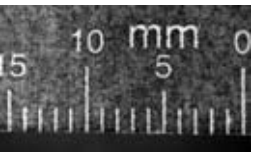
RIVPACS (River Invertebrate Prediction and Classification System) results showed an overall increase in Taxa, Average Score Per Taxon (ASPT) and General Quality Assessment (GQA) scores. The control site showed the highest baseline RIVPACS scores of C, B & C and site 3 recorded the lowest with E, C & E. The assumption was made that all the sites at the baseline survey would be similar but this is clearly not the case. The only sites subsequently not affected by the pollution incidents were sites 1 & 2 and these are therefore the only two that are directly comparable.

am V groynes
nd fish diversity

vard for the Amateur Category. In their citation the s used. The project was undertaken in collaboration ports on his BSc project completed in 2008.

Perch from the River Sence





Limnephilidae sp. Order Trichoptera with case and without (from River Sence). Micro-photography courtesy of S. Taylor

Both the Control site (site 1) and site 2 showed grades A, A & A in Spring 2008; however, the percentage probability of these results being correct was higher for site 2. The assumption that site 2 would have lower scores at the baseline in view of the results for sites 3, 5 & 7 is merited by the Autumn 2007 results where it scored lower than site 1 and in line with the other site scores which was prior to the pollution incidents. It can therefore be concluded that site 2, with the installation of the groyne, improved over the control site without a groyne. It is also reasonable to assume that changes to upstream land use account for the increase in quality at the control site.

Electro-fish survey results showed a decrease in the number of species present over 12 months (*Figure 1*) but further analysis showed this had more to do with club stocking policy regarding rainbows. Whilst total fish numbers did increase from 241 to 266 this was due to an increase in gudgeon from 23.24% of the total catch to 43.98%. Brown trout, chub, dace and roach all decreased in number whilst grayling, gudgeon, and perch (*Photo above*) all increased; this result is not in accordance with the findings of Kail *et al*. (2007) or Lepori *et al*. (2005). The recorded presence of an otter on this stretch of river from Autumn 2007 onwards may account for this result in view of their predation of fish.

The installation of groynes did alter the substrate composition compared with the control site. Whilst there was a change at the control site it was not as marked as the other sites with no sand or silt recorded in the latter after the baseline and a higher percentage of pebbles observed. Alterations in river depth through hydraulic action of water flow were most apparent at site 5 where, because of availability, timber of a larger diameter was used. Site 5 was the only site that attained a depth in line with the optimum depths of 45 to 80 centimetres described by Gore *et al*. 2001. This indicates that to achieve the required depths timber of a larger diameter is needed.

For more information please contact Mark Owen: 01283 761172, email: gopsallfishing@aol.com

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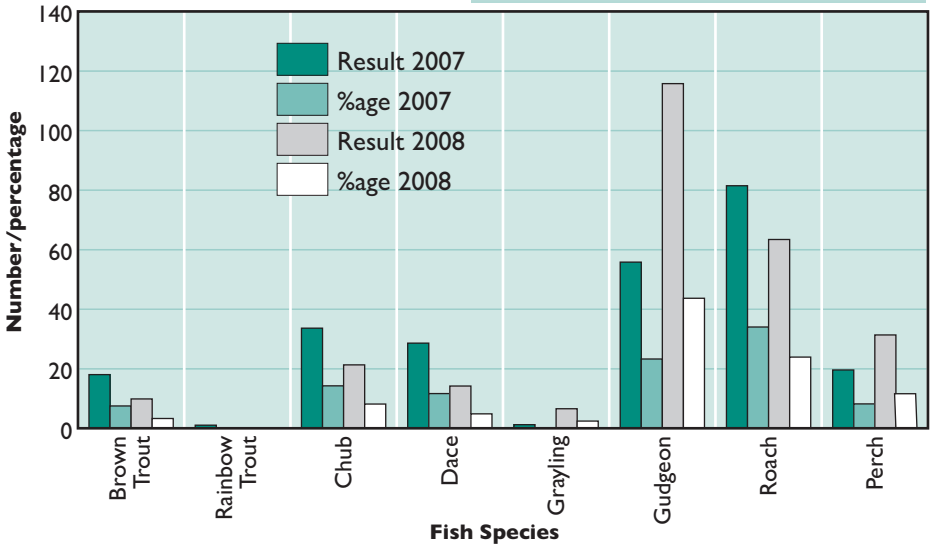
Figure 1: Electro-Fish Survey Comparisons



Invasive Plants… So What?

Japanese knotweed and Himalayan balsam grow to the exclusion of our native species and are spreading unchecked across our rivers. Mike Clough of Japanese Knotweed Solutions provides advice on preventing spread and eradicating existing infestations.

As the owner of an invasive weed control company and a keen fly fisherman I have been uniquely placed to observe the rapid spread of invasive plants along some of our best rivers in the UK. I have often contacted river keepers/authorities to ask 'are you aware that you have Japanese knotweed/Himalayan balsam on your river?' In most instances this is met with a puzzled expression and a general air of 'so what?'

Japanese knotweed does not support any insect life; nothing lives on knotweed and nothing lives in knotweed. It produces a sterile monoculture, which is both destructive and an unsightly blot on the landscape. Himalayan balsam does support insect life and is in fact quite a charming plant - in isolation. You will often see balsam used in advertising shots of fisheries with a river framed by the purple-flowered balsam. However, once established, balsam will choke any river system within just a few seasons.

Photo 1 *Close-up of Japanese knotweed stem*

Japanese knotweed can spread at an alarming rate of 7 m per season in all directions. With its massive seed production Himalayan balsam tops this with a quoted 20 m per season in all directions. Yet despite these statistics there is currently no legislation that encourages landowners to do anything about these plants!

The main issue with both of these invasive species is the physical damage that they are causing to our river systems. Japanese knotweed causes massive problems during times of spate as the stems and rhizomes block overflows and impede drainage. Himalayan balsam covers river embankments but provides no soil retention over winter leading to massive erosion problems during flooding.

So… What should we do?

Step One: Be aware

Japanese knotweed (*Fallopia japonica*) is a member of the dock family. It is a tall, vigorous, ornamental plant that escaped from cultivation in the late nineteenth century to become an aggressive invader throughout our rural and urban environments.

It is rhizomatous (produces underground stems) and perennial (comes back many years), with distinctive branching, arching, hollow bamboo-like stems covered in purple speckles and often reaching 2-3 m in height (***Photo 1***). The leaves of the mature plant are up to 120 mm in length with a flattened base and pointed tip and are arranged on arching stems in a zig zag pattern.

The plant flowers late in the season (August to October), with small

Photo 2 *Flowering stand of Japanese knotweed*

creamy white flowers hanging in clusters from the leaf axils (point at which the leaf joins the stem) (***Photo 2***). The underground rhizomes are thick and woody with a knotty appearance and when broken reveal a bright orange centre. The rhizome system extends 2 to 3 m into the ground and up to 7 m in all directions from the limit of the surface growth.

Photo 3 *Leaves and stem of Himalayan balsam*

Photo 4 *Detail of flowering Himalayan balsam*

Japanese knotweed does not spread by seed - although seeds are produced they are seldom viable. The plant is mainly spread by pieces of the plant being moved around unknowingly (and by fishermen's boots!). The smallest fragment of the plant can re-grow to produce fresh plants - and the fisherman needs to be well aware of this ability.

Himalayan balsam (*Impatiens glandulifera*) was introduced by the Victorians in 1839 as an ornamental greenhouse species. It escaped from gardens into the wild and has rapidly colonised our river banks and any nearby areas of bare ground.

It is a large succulent annual (plant that completes its life cycle in a year/re-grows each year from seed), which grows to about 2 m in height. It has smooth, hollow, succulent stems with a purple tinge. The leaves are serrated and pointed and arranged in pairs, are mid green in colour and about 12-16 cm long (***Photo 3***). The plant produces purplish pink flowers from June to August, which resemble the shape of a policeman's helmet (***Photo 4***).

When the seed pods mature they explode when touched, scattering the seed up to 10 m from the parent plant. The pods react to the slightest disturbance causing the five segments to split along their length and curl and twist explosively. Seeds can easily be spread on boots or waders and can remain viable for up to 2 years. Waterborne seeds will survive and downstream infestations are often caused by migration of seed within the water flow.

A mass infestation of Himalayan balsam and Japanese knotweed can be seen in ***Photo 5***.

Step Two: Don't spread the infestation

- Do not walk through a stand of Japanese knotweed.
- Do not walk through an infestation of Himalayan balsam when the seed heads are ripening.
- Do wash your waders before leaving an area of contamination.
- Make others aware - put up fencing and signage warning of the dangers.
- Fencing and signage should be at least 7 m from the surface growth of the plant.

Step Three: Working party

- Contain the infestation.
- Get a copy of the Environment Agency Code of Practice for Management of Japanese knotweed - available from their website: http://www.environment-agency.gov.uk/static/documents/Leisure/japnkot_1_a_1463028.pdf
- Physical intervention.
- Chemical intervention.
- Initiate an eradication programme or contact Japanese Knotweed Solutions.

At the end of the day the aim should always be to maintain our rivers in as natural a state as possible. These alien plants are not natural - they shouldn't even be here. They need to be taken seriously and dealt with as one would deal with any unwelcome invasion - defend yourselves (with knowledge) and fight back (with whatever means that you have).

For more information please contact Mike Clough, Japanese Knotweed Solutions Ltd: 0161 723 2000, email: jk@sltd.co.uk

Photo 5 *Extensive stand of Japanese knotweed and Himalayan balsam*

News and Events

Courses

Identifying freshwater invertebrates
April 28th to April 29th 2009 - FBA East Stoke, Dorset

A 2-day course involving collection and identification of aquatic invertebrates from running water habitats.
For more information please visit:
http://www.fba.org.uk/index/training.html

Introduction to identifying aquatic plants
June 25th 2009 - FBA Windermere, Cumbria

An introductory course for beginners covering identification of fresh water plants.
For more information please visit:
http://www.fba.org.uk/index/training.html

Conferences and Seminars

16th International Conference on Aquatic Invasive Species
April 19th to April 23rd 2009 - Montreal, Canada

For more information please visit:
http://www.icais.org/html/info_intro.html

CIWEM Annual Conference "Water & The Global Environment"
April 30th 2009 - London

For more information please visit:
http://www.ciwem.org/events/annual_conference

10 Years ECRR Network Seminar "Synergies between River Restoration and River Management focusing on Natura 2000 and Ramsar sites"
May 28th to 29th 2009 - Lelystad, The Netherlands

For more information please visit:
http://www.ecrr.org/lelystad_09.htm

STREAM Project Seminar and Site Visits
June 23rd to 25th 2009 – Salisbury, England

For more information please visit:
http://www.streamlife.org.uk/actions/events/

FBA Annual Scientific Meeting
July 7th to 9th 2009 - Wales

For more information please visit:
http://www.fba.org.uk/index/events.htm

Other News

River Basin District Plans - Responding to the Consultation

The aim of this conference, which took place on 11th February 2009, was to explore, during the early part of the 6 month RBDP consultation period, how stakeholders view these plans. The outputs and reports are now available at:
http://www.coastms.co.uk/Conferences/RBD09.html

Estuary edges: ecological design guidance

This guidance, developed by the Environment Agency through a project coordinated and steered by the Thames Estuary Partnership, is now available via the Environment Agency website. It provides advice and information on enhancing and restoring estuary edges to benefit wildlife and improve public access and awareness.
To access the guidance visit: http://www.environment-agency.gov.uk/business/sectors/100745.aspx

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

Cranfield University **RRC is grateful for the continued support of Cranfield University.**