

River Restoration Centre 24th Annual Network Conference

An action strategy for river restoration

Including programme, abstracts, workshop & site visit information, 2023 UK River Prize finalists and notes pages

19th & 20th April 2023

The Eastside Rooms, Birmingham

RIVER RESTORATION, SOIL STABILISATION & EROSION CONTROL EXPERTISE

Greenfix Soil Stabilisation and

Erosion Control Specialists





Name:

Organisation:

River Restoration Centre 24th Annual Network Conference 'An action strategy for river restoration' 19th – 20th April 2023, Eastside Rooms, Birmingham

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Welcome

Martin Janes RRC Managing Director



Welcome to the 2023 River Restoration Centre Annual Network Conference.

It's great to finally be back in April. To the RRC organising team it feels like quite a milestone and a return to a degree of normality after three years. This event is a big part of our year, and such a big part of this conference is meeting up with old and new faces, discussing ideas, developments, findings and opportunities.

As always, I must thank you all for supporting the RRC. Without our members and supporters, we would not be able to do what we do. We are always looking at how we can do more to inform, empower, guide, train and support the river restoration community, so come and have a chat with us over these two days. An equally large thank you goes to our sponsors, who help subsidise the conference fees for trusts, students and volunteers – please make the most of the opportunity to speak to them in the exhibition space. They are as passionate about their role in looking after our river landscapes as anyone else at this event.

We had a fantastic response to the open invitation to present your work, ideas, concerns and lessons – this allows our team to build the programme and arrange two days of exciting sessions, discussions, workshops, site visits and posters. If you have not been to this conference before, it really is based around 'current thinking' – what is going on now, who is doing what, what still needs to be done, and how – presented by the those who are making it happen across the country.

The title and theme for this year is 'An action strategy for river restoration'. Over the past few years, we have looked at 'restoration practice', how to 'scale up our ambition', what is impacting rivers and how we are addressing this and, last year, how to 'mainstream river restoration'. This year we would like to work with you to propose the actions to achieve this restoration - like the ambition of the Lawton 'Making space for nature' review for England of "bigger, better and more joined up".

The 2023 UK River Prize Awards evening will present more exceptional work. We hope you will join us and the Finalists in celebrating their dedication and achievements. As with previous years, we will also be recognising the individual achievements of this year's nominated 'River Champions'.

Have a great two days.

Martin Janes, Managing Director

Delivering robust and pragmatic solutions



Local understanding, combined with Jacobs global network of industry specialists has made us the consultancy of choice for clients around the world. With dedicated teams in all aspects of river and wetland management and restoration, we have an enviable breadth of skills and expertise at our fingertips. Our experts provide a comprehensive range of skills and a detailed understanding of hydraulic, geomorphological and ecological processes that combine to provide robust and pragmatic solutions that offer real value to our clients.

To find out how we're solving some of our clients' greatest challenges and how we're helping to make the world a better place, contact Jo Cullis on **+44 1392 269 835** or **jo.cullis@jacobs.com.**



Challenging today. Reinventing tomorrow.



RRC Annual Conference 'An action strategy for river restoration' 19th – 20th April 2023

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Nature-Based Specialists for Freshwater & Coastal Environmental Management

River and Floodplain Restoration

- Nature-based restoration design
- Catchment-scale prioritisation
- Construction supervision
- Wetland development/ enhancement

Natural Flood Management (NFM)

- Floodplain reconnection
- Upland landuse management
- Flood hydrograph attenuation and de-synchronisation

Sustainable Nature-Based River Engineering and Management

- Large wood habitat enhancement and bank protection
- Integrated constructed wetlands and sustainable urban drainage
- Sediment management
- Asset protection through sustainable channel stabilisation

Fisheries and Barriers Management

- Habitat surveys
- Barrier assessment & fish pass screening evaluation
- Barrier management design
- Fisheries habitat enhancement design

Peatland Restoration

- Channel restoration
- Hydrological assessment
- Restoration planning and design
- Field surveys

Hydropower Support

- Geomorphic and hydrological assessments
- Scoping and design of measures to mitigate impacts to physical form/ process and aquatic ecology

Technical Services

hydrodynamic and sediment transport modelling; hydrological assessments; geomorphic surveys; topographic/ bathymetric surveys; GIS and AutoCAD; graphic design; construction supervision (including CDM roles) and licensing and application support. Please don't hesitate to get in touch.







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RRC Annual Conference

'An action strategy for river restoration'

19th – 20th April 2023

	Day 1	
08:30	Registration opens	
09:00	Networking and early viewing poster session	60 mins
	Session 1	
	Affinity 1 Chair: Martin Janes (River Restoration Centre)	
0:00	Opening announcements Martin Janes (River Restoration Centre)	10 mins
10:10	Action for river restoration Marc Naura (River Restoration Centre)	20 mins
10:30	Trialling approaches to blended funding Alison Baker (Environment Agency)	15 mins
10:45	Wyre Catchment NFM - the development of the UK's first green investment NFM project Thomas Myerscough (Wyre Rivers Trust)	15 mins
1:00	Discussion	15 mins
1:15	Short coffee break	30 mins
1:45	Biodiversity Net Gain and River Condition Assessments: Lessons learnt and their use to drive achievement of river restoration goals Simon Sherrington (Jacobs)	15 mins
12:00	Strategic design and delivery of integrated catchment restoration monitoring Chris Spray (Tweed Forum)	15 mins
2:30	Discussion	15 mins
2.45	Lunch in Affinity 2	75 mins

Notes



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		Session 2		
	Affinity 1 Ambitious urban restoration <i>Chair: David Hetherington (Arup)</i>	Belmont How to reconnect floodplains <i>Chair: George Heritage (Dynamic Rivers)</i>	Ashstead Working with farmers Chair: Hugh Clear Hill (River Restoration Centre)	
14:00	What Does it take to Restore an Urban River Catchment? Joe Pecorelli (Zoological Society of London)	Restoration on the cheap: Utilising past engineering to maximise naturalisation benefits George Heritage (Dynamic Rivers)	10 tips for better landowner engagement Peter Powell (Welsh Dee Trust)	15 mins
14:15	Delivering Urban River Restoration Sally Homoncik (AECOM)	Large Scale Restoration of the River Breamish SSSI-SAC Neil Williams (AECOM)	Countryside Stewardship Facilitation Fund Danielle Anderson-Hire (Tyne Rivers Trust)	
14:30	Mayfield: A new Urban River Park celebrating heritage and letting nature find a way Matt Hemsworth (JBA Consulting)	Enabling Naturalisation of a Dynamic and Farmed Floodplain Joe Taylforth (Tweed Forum)	Farmers: the obvious solution to river catchment restoration Gwen Maggs (Cornwall Wildlife Trust)	15 mins
14:45	A strategy for delivering ambitious urban river restoration schemes Jennifer Collins (WSP)	Discussion	Successful tactics for engaging agricultural landowners in river restoration on Tweed Chris Spray (Tweed Forum)	15 mins
15:00	Discussion	Discussion	Discussion	15 mins
15:15	Pc	osters & Exhibition in Affinity 2 with tea & co Vote for your favourite poster!	offee	45 mins



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		Session 3		
	Affinity 1 Chalk stream challenges Chair: Jo Cullis (Jacobs)	Belmont The benefits of citizen science <i>Chair: Christianne Tipping (River</i> <i>Restoration Centre)</i>	Ashstead Design & decision-making tools <i>Chair: Marc Naura (RRC)</i>	
16:00	Generating floodplain restoration options for chalk rivers: the opportunities and challenges posed by working in historical landscapes Imogen Speck & David Sear (University of Southampton)	Greater Manchester Ecology Project: improving catchment understanding through citizen science Mike Beard (Natural Course/Greater Manchester Combined Authority)	Rapid 2D hydraulic modelling methodology for design of Stage Zero river schemes Charlie Bleasdale & Stuart Marshfield (Atkins)	15 mins
16:15	The challenges of urban chalk stream restoration design and implementation in highly constrained locations Sam McArthur (cbec eco-engineering UK Ltd)	The role of Citizen Science and Community Engagement in Unlocking the Severn Alice Moore (Severn Rivers Trust) & Kathryn Woodroffe (Canal & River Trust)	The development of hydrodynamic modelling to support river restoration Duncan Kitts (TUFLOW)	15 mins
16:30	Discussion	Achieving Social Outcomes from Wetland Construction Helen Leyshon & David Naismith (Mott MacDonald)	Natural Flood Management Gabrielle Powell (Stantec)	15 mins
16:45	Discussion	Discussion		15 mins
17:00		Short break to move to Keynote Session		10 mins



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Session 4

Affinity 1

Keynote session Chair: Martin Janes (River Restoration Centre)

Keynote Address Charles Rangeley-Wilson

Charles was born in Africa, moved back to England when he was small, went to a Catholic boarding school in Sussex and did his degree at The Ruskin School of Drawing and Fine Art, Oxford University. Charles used to teach Art but nowadays works as a writer, conservationist and river restorationist.

17:10 Charles' work has been published in various magazines and newspapers 25 mins including *Country Life, Countryfile, The Sunday Telegraph, The Field, Gray's Sporting Journal, Trout and Salmon Magazine, The Telegraph, The Times, The Guardian* and *The Independent*.

Charles is passionate about river conservation with a particular interest in the history, restoration and preservation of chalk-streams. He is a vicepresident of the Wild Trout Trust and an Ambassador for the Angling Trust, and the brilliant Wye and Usk Foundation. He is currently running a catchment-scale restoration programme on the River Nar in Norfolk.

17:35	Questions	10 mins
17:45	Poster competition winner & final announcements Martin Janes (River Restoration Centre)	15 mins

18:00

End of Day 1

Evening session

19:00 Drinks & networking



19:30 2023 UK River Prize & River Champions Awards Dinner

Notes



Thursday 20th April 2023

Day 2

08:30 Registration opens

Session 5

09:00	Choice of 1 workshop	session or 1 site visit 3.5 hours
A: Proposing a	Affinity 1 an action strategy for river restoration	<u>Belmont</u> B: How much Space does a river need & How do we get it?
Facilitators: Martin The aim of this d define the actions restoration comm more widely in or all advocating. We will discuss th restoring rivers, f across the UK. W matches the scal implementation a achieving ambition We will summaris funds, ambition, a address these. We will look at th schemes, initiativ how functioning r meeting goals ar We will discuss h morphology and and appreciated against, for exam pollution.	Janes (RRC), RRC directors iscussion workshop is to s that we, as the UK river nunity, need to see adopted rder to achieve what we are he current level of need for loodplains and catchments Ve will look at how this le and rate of and what this means for bus restoration targets. se the constraints of policy, capacity and how we might he emerging national ves and actions to discuss rivers fit, play their part in ad can leverage resources. now concepts of river natural processes are seen by the wider public, set aple, water quality and	Facilitators: Olly Southgate, Karen Slater, George Heritage, Alexandra Bryden (RRC) This workshop considers how to facilitate natural river behaviour in a managed landscape. River restoration is often constrained by a lack of space for natural channel processes and flooding and local community reticence to adapt to a new environment. We will consider the cultural, economic and natural value of floodplains, weighing up the balance between stasis and change and exploring the consequences of continuing to maintain the status quo.

12:30

Lunch in Affinity 2

60 mins



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	Sessi	on 5	
09:00	Choice of 1 workshop	session or 1 site visit	3.5 hour
<u>M</u> C: River re	eeting Room 4 estoration and heritage	<u>Ashstead</u> D: Monitoring – how muc how do we share, and I	h, for how long, how to fund it
Facilitators: Rebe Marc Naura (RRC Our rivers reflect ou The fragments of ou way that can engag designs. For many p processes simply is utilised cultural land challenging in desig recognised for their This workshop will I heritage and archae experiences of deliv Lake District from th navigated a cultural designation, floodin deliver a project wh explore the data and questioning how we rivers, and how dely projects. We will als studies can open th engagement with co support for river res capturing the spirit of Finally, we will explore this information. Wh	cca Powell (National Trust),) ar changing relationship with water. ar past can help tell this story in a le people and inform restoration places reinstating stage zero n't possible. We live in a heavily dscape. This can be particularly gnated landscapes which are cultural and natural significance. ook at rivers through the lens of eology. We will hear about the vering river restoration within the he National Trust, and how they landscape World Heritage Site g histories and SAC designations to ich benefited all of them. We will d evidence available to us, e think about the history of our ving a little deeper can help unlock so look at how cultural heritage ie doors to wider and deeper ommunity groups, helping to build toration through story telling and of a place.	Facilitators: Richard Fforde (RS Connect), Josh Robins (RRC) Monitoring is vital to underst effectiveness of projects, ho funded by grant awards or p investment. This workshop v much monitoring should be should that data be shared t projects and the greater field restoration practitioners. Ho funded?	SPB & Cairngorms anding the wever, it is rarely vrivate will look at how done? How to benefit other d of river w can this be
This workshop is the disciplines. There w perceptions, myth b two disciplines were restoration projects.	win it take and now much will it cost. e start of a conversation between vill be honest account of pusting and a frank account of how e brought together to deliver several		
12:30	Lunch in A	Affinity 2	60 mins



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Session 5 09:00 Choice of 1 workshop session or 1 site visit 3.5 hours Site Visit 1 Site Visit 2: Hatchford Brook at Sheldon Country Park **River Blythe & Alderbrook restoration** (Trent Rivers Trust Project) & Elmdon work at Brueton Park Park (Solihull MBC Project) Facilitator: Ruth Needham (Trent Rivers Trust) & Facilitator: Adam Noon (Environment Agency), Dan Hunt (Solihull Council) Tim Precious-Li (Warwickshire Wildlife Trust) The visit will include a walk along the This visit will involve visiting a 200m stretch Hatchford Brook, an urban, previously of the River Blythe at Brueton Park and a heavily modified stream, within a typical City 400m stretch of the Alderbrook, a tributary of the River Blythe. Various habitat creation Country Park. During the visit we will see the location of two former weirs, installation of in was carried out here in summer 2022 channel restoration features as well as including river renaturalisation through meadow, woodland and wet woodland removal of concrete bed and paved banks, restoration. The location of the work and large wood structure installation to presented a number of Project Management improve flow diversity and increase trout constraints and complications including an habitat. Offline and online pools were also excavated to offer further biodiversity abstraction for irrigation, Birmingham airport close by and flood risk. benefits. Delegates on this visit will learn how the different features were installed and see how they have settled in since installation. 12:30 Lunch in Affinity 2 60 mins

Notes



'An action strategy for river restoration'

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		Session 6		
	Affinity 1 Helping to inform strategies Chair: Josh Robins (RRC)	Belmont Robust monitoring to evaluate success <i>Chair: Phil Boon (Freshwater Biological</i> <i>Association)</i>	Ashstead Addressing barriers Chair: Alexandra Bryden (RRC)	
13:30	Healthy Soils, Healthy Rivers Heather Stott (Wyre Rivers Trust)	Staying agile is the secret to successful monitoring Charles Crundwell (Environment Agency)	Dee River Restoration Max Fini (AECOM)	15 mins
13:45	Innovative river restoration: a case study of the River Greet involving Stage 0 and canopy cover Nerea Gordejuela Alonso (Environment Agency)	Monitoring nature-based river restoration: vision, management, learning Lucy Shuker (QMUL/Cartographer)	Nature-based solutions to sediment management issues at an Icelandic hydropower plant Hamish Moir (cbec eco-engineering UK Ltd)	15 mins
4:00	MoRPh Estuaries: assessing and monitoring the physical habitat of transitional waters Geraldene Wharton (Queen Mary University of London)	Using robust science to demonstrate the benefits and limitations of restoration in an urban environment Daniel Perkins (Roehampton University) & Toby Hull (South East Rivers Trust)	Against All Odds; Removing Bowston Weir Neil Entwistle (University of Salford)	15 mins
4:15	Discussion	Discussion		15 mins
4:30		Short break to move to final session		10 mins

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Notes



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	Session 7	
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	Affinity 1	
	Action	
	Chair: Martin Janes (River Restoration Centre)	
14:40	River restoration for the mighty molluscs of Cymru – An Extinction Prevention Project Oly Lowe & Tristan Hatton-Ellis (Natural Resources Wales)	15 mins
14:55	Landscape Recovery D-J Gent (Environment Agency)	15 mins
15:10	Discussion	10 mins
15:20	An action strategy for river restoration RRC directors	30 mins
15:50	Closing remarks & summary Chair	5 mins
16:00	End of Conference with tea & coffee	

ARUP

Nature Positive Catchments



Find us at our corporate stand at the conference if you would like to talk to us more about what we do!







On Wednesday 19th April 2023, one of the shortlisted finalists will be announced as the winner of the 2023 UK River Prize.

ARUP

The River Restoration Centre (RRC) awards the UK River Prize to celebrate the achievements of those individuals and organisations working to restore our rivers and catchments, and recognises the benefits to society of having a healthy natural environment. After much deliberation the judges selected the four finalists below. The overall 2023 Winner will be presented with the trophy on Wednesday evening.

The 2022 Winners were:

River Life Together, River Ribble, Lancashire & Yorkshire, England Catchment-scale award Partners: Ribble Rivers Trust, Ribble Life Catchment Partnership



Swindale Valley Restoration Project, Swindale Beck, Cumbria, England

Project-scale award Partners: RSPB Haweswater, United Utilities, Environment Agency, Natural England





Sustainably Managing Rivers

The future of our rivers depends on what we do today. Whether it be developing catchment management strategies, designing river realignments or delivering habitat creation through restoring rivers and wetlands, our water team are committed to creating a better environment for now, and for the future.



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'River Champions' seeks to celebrate the outstanding efforts of individuals contributing to river restoration. Below is a brief introduction to the 2023 River Champions, more information about each will be showcased by the RRC over the next year on our website and social media platforms.

Chris Brooks

Chris was instrumental in setting up Scole Pocket Park alongside the River Waveney on the Norfolk/Suffolk border and is Chair of Scole Nature Trails Trust.

David (Barney) Lerner

Barney was the initiator, and is Chairman, of Friends of Bradford's Becks and a founder trustee of The Aire Rivers Trust.

Emma Wren

Outside of her day job, her passion for improving her local watercourses is fundamental to her voluntary roles in the wider community.

Hannah Pearson

Hannah is a champion of Westcountry River Trust's Citizen Science Investigations programme, collecting vital and valuable data across a range of sites

James Elliott

Jim volunteers for the Lincolnshire Chalk Streams Project, helping at numerous volunteer practical days to help keep our precious chalk streams in tip top condition.

John Pring

John has been actively involved in championing the restoration of the rivers in Ullswater for over 20 years.

Mike Kent

Mike is a pillar of his local community, working with Westcountry Rivers Trust to identify sample sites.

Mike Williams

Since 2001 Mike has been instrumental in helping manage as a volunteer the Tidcombe Fen SSSI.

Mitch Perkins

Over the several years Dorset Wildlife Trust have known Mitch, she has proved herself to be an exceptionally dedicated volunteer member of the Riverfly Monitoring Scheme.

Paul Powlesland

Paul is deeply inspirational in his dedication to the River Roding and his ability to gather willing teams of volunteers.

Philip Robson

Phil has been Chairman of the Wyre Rivers Trust (WRT) since 2012, overseeing its development from a volunteer led organisation to one with 7 staff in 2023.

Vicky Whitworth

Vicky is a Citizen Science Investigator, coordinating her community to collect water quality samples.





Meet the RRC Team

Martin Janes - Managing Director

Martin's role combines expert advice and business management. He works with our core funders to ensure RRC provide the expertise they need. He uses his restoration experience within the technical team, represents the river restoration community on steering groups, and oversees RRC management.

Marc Naura - Science & Technical Manager

Marc provides technical advice and expertise on river restoration schemes, helps develop research bids, develops decision support tools and plans training courses. He is interested in what technology and science can do to help practitioners and environmental managers in their decision-making.

Joshua Robins – River Restoration Adviser

Josh provides technical river restoration advice to enquiries and projects. He assists with all project stages including scoping new projects, site visits, providing best practice advice, and evaluating success. Josh manages RRC's annual events program, and plans and delivers training courses and site visits.

Alexandra Bryden - Information Officer

Alex manages the National River Restoration Inventory (NRRI), RiverWiki and UK Projects Map, edits the bulletin and social media platforms, updates the RRC website, and supports events planning and project site visits. She also helps out with technical enquiries and training course preparation and delivery.

Jackie Hinton – Accounts Technician

Jackie undertakes the management accounting functions of the business and works alongside the Managing Director and Science and Technical Manger with business planning, project management and support to the Board. Jackie carries out invoicing and purchasing tasks, as well as day to day accounts.

Nicola Mackley – Centre Administrator

Nicola runs the bookings process for the Annual Network Conference and acts as the RRC's Membership administrator, managing the contacts database and distribution lists. Nicola assists the team with everything that happens in the office and manages incoming calls and emails for the organisation.

Imogen Speck - Science & Technical Assistant

Immy joined the team in January 2023. She will be helping to support RRC projects. Immy has recently finished an MSc in Biodiversity and Conservation and has previously worked as a Research Assistant. She has worked on projects quantifying carbon storage in floodplains and using palaeoenvironmental techniques to guide river restoration design.

Jane Prady – Science & Technical Support Officer

Jane joined the team in January 2023, helping to support projects. Jane completed her PhD in 2010, focused on microscopic marine plankton in the North Atlantic and Arctic. Jane studied at Swansea University and conducted Arctic fieldwork onboard a British Antarctic Survey ship, in collaboration with the Scottish Association for Marine Science in Oban.

Sam Austin – Science & Technical Support Officer

Sam joined the team in January 2023, helping to support projects. Sam is an ecological geomorphologist. Her PhD focused on chalk stream habitats and their management for salmonid populations. Her previous work includes; sediment field and lab based investigations, fish population field surveys, modelling catchment sediment sources, investigating organic sediments and SOD determination and fluvial geomorphology surveys.

Adam Ixer – Science & Technical Support Officer

Adam joined the team in February 2023, helping to support projects. Adam has a background in IT and software development, having worked as a Business Analyst for a number of years. He will help RRC with the development of new tools and technology.

Scientific Advances in River Restoration (SARR) Conference

6th – 8th September 2023 Liverpool University, UK

SARR

The SARR conference will synthesise multi-disciplinary global research advances on river restoration and identify critical knowledge gaps. Scientists worldwide can present their work, discuss ideas, create new collaborations and help advance river restoration science to inform real world solutions.

www.therrc.co.uk/SARR





RRC Training Course Series

RRC training courses are open to anyone with an interest in the topics we offer, including NGO's, wildlife and river trusts, statutory agencies, consultants, contractors, and early-stage researchers interested in linking science to practitioner's needs. These are the courses we currently offer:

Introduction to Hydromorphology (Level 1)

This practical 1-day overview course will introduce participants to hydromorphology.

Developing a Catchment-wide Restoration Plan

This course introduces participants to a methodology for developing a catchment-wide restoration plan to help identify pressures and impacts.

River Habitat Survey Certification

This is a 4-day course where surveyors are introduced to the basics of hydromorphology through fieldwork and presentations. We recently amended this course to be able to hold as a hybrid with some online modules followed by fieldwork.

Mapping for Natural Flood Management (NFM)

This course uses aerial photo interpretation, GIS, fieldwork, lab work and geomorphology to indicate historical floodplain boundaries, surface runoff pathways and demonstrate potential areas of flood storage.

Hydromorphology for River Restoration (Level 2)

This course builds on the introductory course and provides more indepth knowledge of hydromorphological driver/process/form/pressure interaction.

Desk-based assessment for river restoration planning & catchment management

This course teaches you to find, display and interpret existing data to aid river restoration projects and catchment strategy.

Advanced Hydromorphology (Level 3)

This course builds on and applies the concepts of the Level 1 & 2 courses. It involves detailed hands-on application of basic sediment transport equations and flow regime equations.

River Erosion Management

This course will provide an introduction to the types and drivers of river bed and bank erosion, techniques for monitoring erosion, and approaches to manage and control erosion in different settings.

Putting Ecology into River Restoration: An Introduction

This course provides an introduction on how ecological principles can be incorporated within river restoration strategies, with specific reference to freshwater macroinvertebrates.













Find out more about courses & register interest on the RRC website <u>www.therrc.co.uk/rrc-courses-and-workshops</u>



the River Restoration Centre

Working to restore and enhance our rivers

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agencies to develop

and implement River

Basin Management

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construction operations and

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They take an integrated approach to plans and projects in the areas of coastal, river and spatial development, water management and water treatment.



Abstracts and treats 517 million litres of water a day and supplies around 2.2 million customers.



First time at the RRC Conference? Here is a walk through of the conference and tips to get the most out of the 2 days! Head to the registration desk to receive your badge! Head through to the **exhibition room**. Grab a coffee and chat to the sponsors Attend Session 1. This is a Day 1 Lunch break is an presentation session in the main room opportunity to network with delegates and talk to the sponsors. Plus, meet the Choose 1 of the parallel presentation RRC team on our stand! sessions to attend in Session 2 Visit the **Poster session** and vote for your favourite! Choose 1 of the parallel presentation sessions to attend in Session 3 Head back to the main room for the Keynote Address Attend the 2023 UK River Prize Dinner <u>Day 2</u> Attend a workshop or site Choose 1 of the parallel presentation sessions to attend in Session 6 Attend Session 7, the final plenary presentation Please complete a feedback form and hand it back to the RRC team Safe trip home & see you next year!

DRIVEN BY OUR PASSION FOR RIVERS, WETLANDS, AND THE ENVIRONMENT







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Abstracts

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Session 1

TRIALLING APPROACHES TO BLENDED FUNDING

A. BAKER¹

1 Environment Agency

The environmental sector recognises the need to deliver nature-based solutions at scale and pace to tackle our climate and biodiversity crises. In this rapidly developing area, the Environment Agency are piloting blended funding approaches and trialling governance structures through several initiatives to explore these issues, including:

- Natural Environment Investment Readiness Fund
- Shared Outcome Fund for nature-based solutions for climate change at a landscape scale
- Catchment/ecosystems markets

Through our work we are:

- gauging land managers' attitudes towards nature-based solutions
- testing a range of revenue streams from ecosystem services
- understanding investors' requirements
- defining regulatory boundaries for ecosystems markets

By providing a pipeline of projects and exploring mechanisms, we are helping to shape Defra policy and inform other programmes.

We hope to provoke thought and discussion, by sharing our programme at RRC, as we aim to build confidence in this space, ultimately resulting in significant investment in our environment.

WYRE CATCHMENT NFM - THE DEVELOPMENT OF THE UK'S FIRST GREEN INVESTMENT NFM PROJECT

T. J. MYERSCOUGH¹

1 Wyre Rivers Trust

Since 2020 The Rivers Trust, Triodos Bank and the Wyre Rivers Trust have been collaborating with a range of partners to develop the the Wyre Catchment NFM project. A project that will see the delivery of 70Ha of NFM interventions and 39Ha of woodland creation in the Upper Wyre and Calder catchments, helping to alleviate flooding in Churchtown, which sits on the banks of the River Wyre near Garstang. In addition to this the project will also have benefits for water quality, water quantity, biodiversity and carbon sequestration. The project will be funded by private investment, which is repaid by beneficiaries of the ecosystem services produced by the project. Land managers, farmers and landowners will be paid to host and maintain the interventions, initially for 9 years, with the potential for further extensions to 30 and 50 years. The learnings of the project have paved the way for a raft of further investment readiness projects, including larger green finance NFM projects.

BIODIVERSITY NET GAIN AND RIVER CONDITION ASSESSMENTS: LESSONS LEARNT AND THEIR USE TO DRIVE ACHIEVEMENT OF RIVER RESTORATION GOALS

S. E. SHERRINGTON¹

1 Jacobs

From November 2023, planning developments are required to achieve a 10% net gain in biodiversity within their planning application boundaries. As a consequence, river condition and biodiversity net gain assessments have the opportunity to become highly influential in the restoration of river channels, riparian zones and floodplains. However, with less than 12 months remaining until the adoption of the mandatory target, further work is required to improve their programming to ensure they are used as key tools in delivering river restoration goals. This paper will share experiences from undertaking both assessments over the past 18 months. It will discuss lessons learnt and queries raised relating to effective programming, undertaking assessments (including off-site interventions), and concludes with how river condition and biodiversity net gain assessments fit into the wider context of river and floodplain restoration.

STRATEGIC DESIGN AND DELIVERY OF INTEGRATED CATCHMENT RESTORATION MONITORING

C. J. SPRAY¹ & A. Z. BLACK²

1 Tweed Forum, 2 University of Dundee

The Eddleston Water project, Scottish Government's long-running study of the impact of natural flood management measures on flood risk and habitat restoration, provided the chance to review restoration monitoring at a strategic and operational level. The project implemented a large range of restoration measures in the river and across the 69km2 catchment. We review the monitoring strategy and show how the monitoring network developed tried to meet the strategic aims, and what subsequent changes were required. Covering a range of scientific disciplines, we explore how these were integrated to provide a comprehensive assessment of restoration success. Lessons to help inform other river restoration monitoring programmes include the importance of a scoping study, capturing the full range of environmental variables pre-restoration; limitations of BACI designs; and the need to focus integrated monitoring on a process-based framework and impact cascade covering the trajectory of recovery.


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Ambitious urban restoration

WHAT DOES IT TAKE TO RESTORE AN URBAN RIVER CATCHMENT?

R. GRAY¹, J. PECORELLI² & R. HAINE³

1 Crane Valley Community Interest Company, 2 Zoological Society of London, 3 Frog Environmental

The pressures on urban catchments are numerous and challenging. In West London a partnership of Friends of River Crane Environment, Frog Environmental and ZSL has been working toward restoring the Crane since 2014, bringing community groups along with them within the Citizen Crane project. The spotlight on the river and the coordinated community support for it has made it an ideal catchment for Thames Water to pilot their Smarter Water Catchment (SWC) approach and use it as an urban case study. SWC investment has accelerated work on the river and highlighted some of the challenges of muti stakeholder catchment planning and delivery of environmental improvements. This presentation will summarize our learnings from nine years of working toward our vision of an urban river corridor teeming with wildlife and unconstrained by pollution, serving as a vital community resource.

DELIVERING URBAN RIVER RESTORATION

S. C. HOMONCIK¹ & H. REID²

1 AECOM, 2 SEPA

AECOM, in collaboration with SEPA and local authorities, backed by the Water Environment Fund, have delivered two urban river restoration schemes; the Tollcross Burn in Sandyhills Park, and the Levern Water in Barrhead. AECOM designed a daylighted channel for the Tollcross Burn to encourage natural processes, improve access, amenity and biodiversity. The Levern Water in Barrhead was modified by past industrial activity and flowed through a brownfield site with concrete walls, channel realignment and a redundant weir impacting its status. Locals felt unsafe, with antisocial behaviour prevalent. The design includes channel realignment, reprofiling and landscaping, and removal of the weir. These schemes were challenging to deliver, taking many years to reach construction and requiring multiple design iterations, encapsulating the difficulties of restoring rivers in urban areas with a long history of industry. However, the lessons learned are vital to streamline and guide future projects.

MAYFIELD: A NEW URBAN RIVER PARK CELEBRATING HERITAGE AND LETTING NATURE FIND A WAY

M. HEMSWORTH¹, C. BYRNE² & B. BOULTON³

1 JBA Consulting, 2 Buro Happold, 3 Environment Agency

Designed through a collaborative approach by multiple stakeholders, Mayfield is one of the leading regeneration schemes in the UK which exemplifies urban river restoration as a core part of place making whilst working with challenges that industrial legacies bring and celebrating heritage. The landmark regeneration project has transformed a 24-acre derelict area of central Manchester into a vibrant new community with sustainable ecology at its core as part of the 6.5-acre public park. The project aimed to tackle long term biodiversity loss and it has re-opened a long-forgotten section of river. In a pioneering approach to collaboration the EA Green Growth Team has provided advice throughout the project, working closely with

the design team to ensure an optimum approach to river restoration has been achieved whilst being sympathetic to site constraints.

A STRATEGY FOR DELIVERING AMBITIOUS URBAN RIVER RESTORATION SCHEMES

J. COLLINS¹

1 WSP

WSP are actively leading a number of highly ambitious urban river restoration projects to facilitate the delivery of new developments. Both our public and private sector clients aim to implement a range of enhancements from small scale habitat enhancements to challenging de-culverting and weir removal projects to meet their environmental objectives. Mandatory biodiversity net gain (BNG) provides an exciting opportunity to achieve ambitious urban restoration in areas where previously projects may have been deemed technically infeasible or disproportionately costly. Using lessons learned from various case studies of urban development (including road improvements and private housing developments), we share our strategy for achieving ambitious restoration and highlight some of the challenges faced in realising BNG on urban sites. Collaboration with rivers trusts has been crucial to our success to date and we see these organisations as critical to the future of sustainable urban development

How to reconnect floodplains

RESTORATION ON THE CHEAP: UTILISING PAST ENGINEERING TO MAXIMISE NATURALISATION BENEFITS

G. HERITAGE¹ & N. ENTWISTLE²

1 Dynamic Rivers, 2 University of Salford

Lowland and upland river systems in the UK are unbalanced having been subject to centuries of subjugation, suppressing any signs of local dynamism and enforcing an artificial disconnect between watercourses and floodplains. Natural river processes are not in line with the imposed engineered restraints on behaviour but have not been destroyed. This can be seen at certain 'hot spots' during extreme floods where the river overwhelms the controls placed on its functioning and briefly breaks free! Reverse engineering of the restraints on dynamism at these 'hotspots' can turn them into conduits for accelerated change. We report on the impact of very low cost targeted 'hotspot' intervention on both lowland and upland systems. Monitoring data suggests that change has been widespread compared to the scales of intervention, both in-channel and valley bottom dynamism has been significantly altered and the ecology is slowly responding to a more diverse and changing assemblage of wetter habitats.

LARGE SCALE RESTORATION OF THE RIVER BREAMISH SSSI-SAC

N. D. WILLIAMS¹, A. LAVERTY², H. HARRISON² & E. HOBBAH²

1 AECOM, 2 Environment Agency

AECOM, the Environment Agency and Natural England, with the Tweed Forum and a private landowner, are restoring a major site on the River Breamish, part of the Till-Tweed SSSI and SAC. This work is part of the LIFE WADER project co-funded by the European Union. The existing channel is straightened between agricultural flood embankments for over a mile. The restoration design uses minimal engineering to breach embankments at palaeochannels, and nature-based solutions to evolve the river back to its meandered course through floodplain wetlands. Modelling and visualisations were presented to the landowner at their farm, in open discussions about options for managed recovery of channel migration patterns and flooding, and the land use changes that would need to be agreed. Substantial Countryside Stewardship payments were then formulated to manage changes in land productivity. The scheme shows how large scale river restoration can be achieved through ambitious engagement and green funding.

ENABLING NATURALISATION OF A DYNAMIC AND FARMED FLOODPLAIN

J. E. TAYLFORTH¹

1 Tweed Forum

The River Glen SAC is a high energy river with a long history of management to protect farmland (embankments, dredging and bank protection). Over the past 15 years, the river has tried to avulse (switch course) on several occasions, driven by sudden embankment failure during large flood events. On each occasion, the river was trained back to its original course to keep the status quo. Over the last decade Tweed Forum, the Environment Agency and

Natural England worked with the four affected farms to ease the transition to a more natural system, while improving resilience to farmland and infrastructure. In 2021, working with Dynamic Rivers, we employed a light touch approach, strategically removing 1.5 km of flood embankments to reconnect 40 ha of floodplain and creating 1km of new embankments to protect arable farmland. These actions have improved river and floodplain connectivity, allowing flood energy to dissipate over a wide area and encouraging more dynamism and diversity.

Working with farmers

10 TIPS FOR BETTER LANDOWNER ENGAGEMENT

P. POWELL¹

1 Welsh Dee Trust

Engaging agricultural landowners can be a difficult but very important aspect of river restoration. I (Peter Powell, CEO of Welsh Dee Trust) grew up on a dairy farm and have been engaging agricultural landowners on projects for over 10 years, focusing on both pollution and habitat restoration. There are a huge variety of aspects which are important for clear and successful engagement such as being clear about your and their goals, creating win-win situations, and ultimately working as a partnership to tackle problems together. My talk will go through 10 tips for engaging landowners with some anecdotes and a couple of big mistakes which should be avoided. This will hopefully leave all participants with some key ideas to go away with for improving their landowner engagement.

COUNTRYSIDE STEWARDSHIP FACILITATION FUND

D. ANDERSON-HIRE¹

1 Tyne Rivers Trust

Working with landowners and land managers through the Countryside Stewardship Facilitation Fund to improve the natural environment on a landscape scale. Knowledge transfer workshops have been delivered throughout a three-year period on subjects such as;

- Water quality
- Natural flood management
- Habitat creation
- Soil health

Farmers have been working together to identify issues throughout the Tyne catchment, by networking with partners as well cross project working. The Trust have been able to deliver environmental improvements such as; tree planting, bankside erosion repairs, a livestock bridge, sediment trap and a muck bay to reduce diffuse pollution and improve water quality. Tyne Rivers Trust have delivered three Facilitation Funds since 2017, working with over 120 farmers and covering a large land area of over 34,000Ha. Facilitation Funds can be found throughout England and are inputting to the new Environment Land Management Scheme as case studies for future grant schemes.

FARMERS: THE OBVIOUS SOLUTION TO RIVER CATCHMENT RESTORATION

G. MAGGS¹

1 Cornwall Wildlife Trust

The farming sector plays a vital role in river restoration and for the past 10 years the Cornwall Wildlife Trust has been effectively engaging with farmers to improve water systems and biodiversity. Here we outline key components to successful engagement: 1) relationships – approaching farmers openly, without judgement and co-designing solutions for the environment and farm businesses, 2) knowledge – providing expert advice through farm

advisors and ecologists, 3) time – having multiple visits and taking the time to ensure farmers feel valued, 4) continuity - ensuring the same people work with farmers to avoid engagement fatigue, 5) support – financially through grants, logistically with paperwork and physically through volunteers for manual tasks and 6) learning – providing training and knowledge exchange opportunities within farming committees. These components demonstrate how to ensure the farming sector is part of the solution, not the problem, to river catchment restoration.

SUCCESSFUL TACTICS FOR ENGAGING AGRICULTURAL LANDOWNERS IN RIVER RESTORATION ON TWEED

C. J. SPRAY¹, L. COMINS¹ & H. ROBERTSON¹

1 Tweed Forum

For the last 30 years, Tweed Forum has been engaging agricultural landowners and other stakeholders from communities across the 5,000km2 cross-border catchment of the river Tweed. Much of this has focussed on working with individuals and groups to facilitate the restoration of rivers and their immediate catchments. Experience of successes and failures has helped us develop a strategic approach to our engagement, recognising the potential opportunities and barriers for effective two-way communication. Key elements include: Listening – and waiting; Agreement what the problem(s) are before we start talking about potential solutions; Language; Recognition of others' position; What success looks like for different audiences (especially in financial terms); Transparency; Evidence, monitoring & review; Reporting back to stakeholders; and most important of all - Respect and Trust.

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Chalk stream challenges

GENERATING FLOODPLAIN RESTORATION OPTIONS FOR CHALK RIVERS: THE OPPORTUNITIES AND CHALLENGES POSED BY WORKING IN HISTORICAL LANDSCAPES

I. R. SPECK¹, B. PEARS¹, C. RANGELEY-WILSON² & D. A. SEAR¹, D. KITTS³

1 University of Southampton, 2 CaBA, Chalk Stream Restoration Group, 3 TUFLOW

The floodplains of chalk rivers are hotspots for carbon storage and biodiversity. Historically, they were also areas of early and intensive modification by humans. Drawing on a recent example of floodplain restoration on the River Stiffkey, Norfolk, we explain how the environmental history stored in floodplain sediments, coupled with the preservation of historical features of modification, combine to generate both opportunities to assist and constraints on the restoration options available. We highlight a conflict between those policies that encourage floodplain and river restoration and those within the heritage sector which seek to protect and preserve archaeology and historical landscapes. We conclude that communication needs to be improved between the heritage sector and those seeking to restore natural floodplain processes. At an operational level, these conversations must occur early on to ensure that design objectives account for heritage features within the floodplain.

THE CHALLENGES OF URBAN CHALK STREAM RESTORATION DESIGN AND IMPLEMENTATION IN HIGHLY CONSTRAINED LOCATIONS

S. G. MCARTHUR¹

1 cbec eco-engineering UK Ltd

Restoration of rivers in urban environments is often a highly constrained activity, with constraints imposed by available green space, existing buildings, community requirements and maybe most importantly, the natural capacity of the river to recover. Despite these constraints, cbec successfully helped deliver the design and implementation of a heavily impacted section of the River Darent in Dartford, Kent. In this presentation, we will discuss how this concrete-lined section of a 'chalk stream' with generally poor ecological quality was restored to a more natural, sinuous planform. Furthermore, we will demonstrate the importance of working with our project partners, and how in doing so, we combined natural restoration measures with softer bank protection materials to reproduce the more visually appealing 'eco-geomorphic characteristics of a lowland chalk stream.

Session 3 The benefits of citizen science

GREATER MANCHESTER ECOLOGY PROJECT: IMPROVING CATCHMENT UNDERSTANDING THROUGH CITIZEN SCIENCE

M. F. BEARD¹

1 Natural Course/Greater Manchester Combined Authority

Natural Course is an EU LIFE Integrated Project accelerating progress towards the objectives of the Water Framework Directive and developing an integrated approach to water management. Greater knowledge via professional surveys and citizen science is vital for the project. A novel variation of the BTO's Wetland Bird Survey sees volunteers monitoring the River Irwell. Comparing 5 years of results to other data examines the impact of a new adjacent flood basin. Citizen scientists have complemented a professional survey of Giant Hogweed and Japanese Knotweed on the River Irwell Catchment. This eye-opening map has been used to create an INNS control strategy for these problem plants. The Otter Bridge Survey of this charismatic apex species, carried out entirely by volunteers, has created an indicator for the health of waterbodies. Partnership working has empowered citizen scientists to gather data which is then used to develop evidence and to plan projects and interventions.

THE ROLE OF CITIZEN SCIENCE AND COMMUNITY ENGAGEMENT IN UNLOCKING THE SEVERN

A. MOORE¹ & K. WOODROFFE²

1 Severn Rivers Trust, 2 Canal & River Trust

A talk to detail the role that Citizen Science and Community Engagement has played in the Unlocking the Severn Project. This work has been a critical element of the project in educating people and re-engaging them with the river. Citizen science methods included visual bankside counts, night time spawning monitoring, collecting eDNA samples and unique remote volunteer opportunities. As the project's fish passes have been completed, volunteers have played a crucial role in helping determine the efficacy of the remediation work. Wider community engagement has included work with schools and colleges, mindfulness workshops and exhibitions and tours of Diglis island and fish pass. Hosting a symposium and digital communications has allowed engagement on a national and international scale. Alongside there being a benefit to the project, volunteers and participants have provided fantastic feedback on the wellbeing benefits and positive impacts of being involved in the project.

ACHIEVING SOCIAL OUTCOMES FROM WETLAND CONSTRUCTION

H. SIMPSON¹, H. LEYSHON¹, A. AFIONTZI² & D. NAISMITH¹

1 Mott MacDonald, 2 Severn Trent Water

Mott MacDonald and MMB jointly delivered a biodiversity improvement scheme via wetland creation for Severn Trent Water. The project created wetland habitat so flows in Cinderford Brook benefit from storage and release of water and provide ecological resilience to low flows through biodiversity enhancement. Community engagement was embedded in project delivery to positively impact the local area. We aligned with the social outcome themes of Accessibility,

Inclusion, Wellbeing, Empowerment and Resilience. Community engagement highlights include a customer drop-in event, a planting day with community members and sessions with a Brownie group about the importance of habitat creation and a poster competition for local children. The project provided a chance to promote the benefits of nature-based solutions, to empower and educate young people and to ensure a far-reaching impact beyond a client deliverable which would last for generations.

Design & decision-making tools

RAPID 2D HYDRAULIC MODELLING METHODOLOGY FOR DESIGN OF STAGE ZERO RIVER SCHEMES

S. MARSHFIELD¹ & C. BLEASDALE¹

1 Atkins

HEC-RAS is a freely available hydraulic modelling package, which adopts a sub-grid method that pre-processes level-volume relationships for each 2D cell using the detail of the underlying terrain. This reduces the number of computations required and greatly speeds up run times while capturing detail. With the increasing availability of topographic and hydrological data, it is quicker than ever to build informative models of river reaches and catchments. At Atkins, we are utilising HEC-RAS to investigate the flood risk benefits of nature-based solutions. Once a baseline model is established, intuitive terrain modification tools are used to test restoration features. The quick run times and access to high-resolution data, coupled with the ability to quickly modify the terrain and interrogate results anywhere in the model, creates a rapid assessment methodology and powerful toolkit to test and refine design ideas and create striking material to engage with stakeholders.

THE DEVELOPMENT OF HYDRODYNAMIC MODELLING TO SUPPORT RIVER RESTORATION

D. R. KITTS¹

1 TUFLOW

For the past few decades, hydrodynamic modelling has played a key role in supporting river restoration to assess flood risk and geomorphological impacts. Continuous development, both in terms of software functionalities as well as computational hardware, has added to the capabilities of hydrodynamic modelling. Whereas originally, hydrodynamic modelling was 1D in nature, the benefits of 2D and even 3D modelling techniques are now being used to help inform river restoration design. Early application of hydrodynamic models also utilised proxy outputs such as flow velocity or bed shear stresses to represent geomorphological processes whereas we can now model sediment transport and other processes in detail. Using examples of the modelling of large wood impacts, reach-scale sediment transport and temperature modelling and whole catchment models for Natural Flood Management, recent developments in 2D and 3D hydrodynamic modelling functionalities will be presented.

NATURAL FLOOD MANAGEMENT

G. POWELL¹, K. THISTLETHWAITE¹ & R. RIDDINGTON¹

1 Stantec

Stantec developed a method for South West Water (SWW) to meet EA criteria under WINEP driver Natural Environment and Rural Communities. This project identifies where habitat improvements in the catchment could improve flood resilience at 3 at-risk SWW assets. Through opportunity mapping and collaborative working, opportunities for natural flood management (NFM), river restoration, habitat creation, and biodiversity gains were identified. Unsuitable catchment areas were cut using the EA NFM Studio and ArcHydro Stream

Definition layers. Current and potential NFM projects were mapped over SWW landholdings alongside landholdings with the highest scoring areas. A multi-criteria assessment ranked the total potential for 3 NFM types (Woodland, River and Floodplain, and Runoff), prioritising areas with greater ecological and habitat benefit. This identified potential locations for SWW investment and collaboration. This method is a template for future asset resilience and habitat programmes.



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Image is of river restoration undetaken on the River Beane, Hertfordshire, for Clients Hertfordshire County Council and the Environment Agency. Photograph by Peter White.

Session 6 Helping to inform strategies

HEALTHY SOILS, HEALTHY RIVERS

H. L. STOTT¹ & T. J. MYERSCOUGH¹

1 Wyre Rivers Trust

To address the issue of soil degradation an innovative soil health index has been developed by the Wyre Rivers Trust. This has involved conducting soil surveys that assess a range of biological, chemical, and physical soil properties on fields known to be at high risk of soil degradation and fields with good soil management practices. These measurements have guided the development of Upper Wyre Catchment specific, theoretical minimums and maximums, and the relationships between these values to healthy soils, to develop a soil health index model. This model allows the Wyre Rivers Trust to survey soils and produce a quantitative value of soil health, pinpointing areas for improvement with recommendations for land management practices that reduce soil degradation and restore soil functioning. Through a monitoring programme the benefits of the changes in land management can also be quantified, supporting farmers transition to regimes which protect their soils and in turn our rivers.

INNOVATIVE RIVER RESTORATION: A CASE STUDY OF THE RIVER GREET INVOLVING STAGE 0 AND CANOPY COVER

N. GORDEJUELA ALONSO¹, S. J. DUGDALE² & J. WELLS³

1 Environment Agency, 2 University of Nottingham, 3 Trent Rivers Trust

A Stage 0 restoration and an analysis of the canopy cover were performed in 3 reaches of the River Greet. A desk-based methodology was developed for the integration of the two approaches, looking for canopy and stage 0 synergies and complementarities. This methodology allowed some adjustments for the practical implementation of a restoration plan, considering common constraints that usually happen in highly anthropized basins. Two zones on reach 2 and three zones on reaches 6-7 were found to be the most suitable to carry out the restoration, meaning the improvement of the river-floodplain system in 3.8 and 3.4 Ha, respectively. Interaction with the canopy was minimal due to the virtual absence of riparian forest, but it served to delimit the extent of restoration actions. Application of the proposed methodology revealed a high influence of human-related restrictions, which may indicate how today's streams are embedded into a broader socioeconomic fabric.

Robust monitoring to evaluate success

STAYING AGILE IS THE SECRET TO SUCCESSFUL MONITORING

C. CRUNDWELL¹

1 Environment Agency

We will explain the importance of being agile when developing and delivering a multi-year monitoring programme. The bid stage of the Unlocking the Severn project proposed extensive monitoring of the twaite shad. This would help steer the restoration, engage the public and produce new science. Over 7 years as the projected moved through bid, development, delivery, and post project appraisal the techniques have changed. If we were not agile but remained fixed to the those proposed at the outset, then the project would not have been such a success. It will focus on bid wording, why and when to change techniques and the importance of a dynamic monitoring group to steer decisions based on collective thinking and common goal. The lessons learnt will help others as they start their restoration journey, promoting monitoring and project appraisal to the heart of the project from the very beginning.

MONITORING NATURE-BASED RIVER RESTORATION: VISION, MANAGEMENT, LEARNING

L. SHUKER¹, T. HULL² & A. M. GURNELL¹

1 QMUL/Cartographer, 2 South East Rivers Trust

The outcomes of ambitious or innovative nature-based restoration cannot be certain. Robust, targeted, repeat monitoring is essential to capture evidence of the short and medium term outcomes of such restoration actions. Monitoring changes through time using a BACI design (Before-After-Control-Impact) allows outcomes to be (i) judged against the initial condition and restoration vision, (ii) used to introduce appropriate adaptive management, and also (iii) to promote learning that can feed into future similar restoration projects and strategies. We illustrate these benefits through an analysis of data from six surveys of the Beverley Brook, Wimbledon Common capturing pre-project conditions in 2018 through four years of post-project recovery (2019-2022) to characterize the ways in which a straight, historically-resectioned, morphologically-simple reach evolved in response to the introduction of locally-felled trees and large wood pieces, and in comparison with restoration objectives.

USING ROBUST SCIENCE TO DEMONSTRATE THE BENEFITS AND LIMITATIONS OF RESTORATION IN AN URBAN ENVIRONMENT

D. PERKINS¹ & T. HULL²

1 University of Roehampton, 2 South East Rivers Trust

River restoration is a common activity, however the effectiveness is often questioned, especially in urban settings, hampered by limited or absent monitoring to demonstrate long-term impact. In 2016 a range of commonly used techniques were implemented to restore 600m of the Beverley Brook. Invertebrate and fish communities were monitored before works and for five years post restoration. Across the monitoring period, invertebrate abundance was up to 148% higher. Fish biomass increased by 282%, demonstrating significant ecological responses across trophic levels. However, changes were primarily observed in the abundance

of existing taxa, rather than changes in species richness & development of novel assemblages, suggesting that external anthropogenic impacts associated with urban environments can hamper recovery. Yet despite this, the results suggest that a restored section of river can bring significant benefits in terms of providing increased resilience to ecological communities.

Addressing barriers

DEE RIVER RESTORATION

M. FINI¹, N. WILLIAMS¹ & K. BARNETT¹

1 AECOM

AECOM and Natural Resources Wales have designed river restoration solutions to improve fish passability at a number of weirs along the River Dee as part of the LIFE Dee River project, which is part of the LIFE WADER project co-funded by the European Union. Detailed design has been completed for the partial removal of Erbistock Weir, which is 4m high and 55m wide. To manage risks for such a large structure, we used predictive models of flow patterns and hydraulically-driven erosion, sediment transport and deposition. The geomorphological changes were investigated via a semi-quantitative sediment transport analysis carried out using CAESAR-Lisflood, a Landscape Evolution Model. Both 'lower' and 'higher' scale of change scenarios were developed to understand any potential geomorphological risk. This project shows how sediment modelling can be implemented to inform the design of naturallike solutions implemented to achieve ecological connectivity for a broad range of fish species.

NATURE-BASED SOLUTIONS TO SEDIMENT MANAGEMENT ISSUES AT AN ICELANDIC HYDROPOWER PLANT

H. J. MOIR¹

1 cbec eco-engineering UK Ltd

A multi-scale nature-based project on the Andakilsa River, Iceland is presented, relating to sediment management associated with a hydropower scheme. Initially, a site-specific bank erosion issue was addressed by applying an extensive nature-based 'large wood' design. However, wider scale issues responsible for the bank erosion (i.e. loss of sediment supply due to the HP scheme) required to be addressed. A sustainable sediment management strategy involving a 'retro-fitted' variable head spillway crest that allows the natural passage of coarse sediment over the structure and downstream during high flow events is presented. However, the HP scheme receives artificially elevated sediment supply rates, owning to upstream land-use practices. To 'naturalise' sediment supply, planting of native riparian tree cover in the upper catchment is proposed with an associated cost-benefit analysis demonstrating the significant value of such a longer-term management approach.

AGAINST ALL ODDS; REMOVING BOWSTON WEIR

N. ENTWISTLE¹, P. EVOY, O. SOUTHGATE & G. HERITAGE

1 University of Salford

Spanning 37 metres across the width of the River Kent SSSI/SAC and standing 3 metres high, Bowston weir was the largest weir to be removed in 2022 under river restoration. This project was almost abandoned on multiple occasions and this talk details the key issues fought to get this 5-year project to completion. Built in 1874, the removal allows the river to renaturalise benefiting both people and wildlife with a 44% uplift in biodiversity, reduced flood risk, improvement to sediment transport and fish migration. Monitoring, post removal, has provided evidence to visually show and quantify that the river has reacted magnificently; with an abundance of varied upstream habitat, sediment movement and settlement within the reach, and a series of pools and riffles have emerged from the previous weir pond. Finally, we detail three imperative points for the future of weir removals in the UK:

- 1. National Government must provide incentives for structure owners to remove unnecessary barriers
- 2. Local Planning Authorities must prioritise applications for approval that evidence multiple benefits.
- 3. Funding must be available for pre- and post-completion monitoring to provide qualitative evidence of change for project support and dissemination.

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Royal HaskoningDHV is an environmental and engineering consultancy with a strong track record in the planning, design and implementation of river restoration, fish passage enhancement and catchment management projects across the UK.

We use our 'Nature Driven Design' approach to improving the water environment through the restoration of natural processes, recognising the importance of working with natural river processes to deliver sustainable river improvements in a multi-use landscape.

Our current projects include:

- River channel and floodplain restoration: Design of channel restoration and gravel augmentation measures on the River Torridge, Devon and identification of restoration options on tributaries of the River Nith, Dumfriesshire.
- Fish passage enhancement: Design of fish passage solutions on the Pembroke River, Pembrokeshire and River Wandle, Sutton.
- Consenting and site supervision: Construction project management and site supervision of restoration measures on the River Nith, Dumfriesshire and consenting for the restoration of the Ugbrooke Stream, Devon.
- Nutrient and contaminant management: Development of a nutrient budget calculator and design of treatment wetlands to deliver nutrient neutrality in the River Frome, River Lambourne, River Wensum, River Clun and River Camel, and monitoring and design of a nature-based solution to immobilise mercury-contaminated sediments in the North River, Surrey.



Any questions? For further information about our work, come and visit our stand, or contact Dr lan Dennis, Water Environment Sector Lead on ian.dennis@rhdhv.com or 01444 476632

RIVER RESTORATION FOR THE MIGHTY MOLLUSCS OF CYMRU – AN EXTINCTION PREVENTION PROJECT

O. LOWE¹ & T HATTON-ELLIS¹

1 Natural Resources Wales

An ambitious river restoration project in northwest Wales to lessen the plight of the critically endangered Freshwater Pearl Mussel. Describing the unique site history, cumulative damage from dredging, land management practices and morphological processes of past and present structures to the river. Outlining how sediment changes impact mussels and showcase the numerous restoration measures undertaken in 2022 to restore this special river. This case study includes logistics of dismantling a 12ft high embankment to reconnect the river with its floodplain, reintroducing 854 tons of boulder/cobbles and 333 tons of gravel to rebuild the riverbed from the bottom up, removing fords, weirs, building bridges, modifying dams, altering management practices, and working with key stakeholders within the local community. We will showcase the goals of the Pearl Mussel strategy and discuss how this has been implemented creating Wales first Ark area ready for reintroductions of captive bred mussels.

LANDSCAPE RECOVERY

D-J GENT¹

1 Environment Agency

Landscape Recovery is part of the developing Environmental Land Management schemes. Landscape Recovery is innovative, working with natural processes and blended finance, implementing nature-based solutions, it has multiple benefits and will generate much learning. Round 1, saw 22 projects selected. Each cover an area of between 500 and 5,000 hectares. They involve groups of land managers and farmers, including tenants, working together to deliver a range of environmental benefits across farmed and rural landscapes. Collectively, the successful projects aim to restore nearly 700km of rivers and protect and enhance species such as water vole, otter, pine marten, lapwing, great crested newt, European eel and marsh fritillary. The Environment Agency is leading the delivery of round 1, 'Restoring England's streams and rivers' projects. This talk will be an update on the journey so far, challenges yet to come, and opportunities for the future.



Harnessing nature's power

We find solutions to society's toughest challenges by integrating nature. The most effective and efficient solutions are often embedded in nature, and we believe wholeheartedly that nature-based solutions increase benefits for the projects we work on, and integrating them in our work is the right thing to do for our environment and the legacy that we want to leave.



Julia Baker Technical Director of Nature Services Julia.baker@mottmac.com

Salix

BUILDING WITH NATURE

- River restoration
- Wetland habitat creation
- Natural flood management
- Native plant nursery

Contact details: Tel: 0330 002 1788 Email: info@salixrw.com Website: www.salixrw.com I @SalixBio

RRC Annual Conference 'An action strategy for river restoration' 19th – 20th April 2023 Poster list Taylor & Francis Group Quantifying runoff attenuation feature (RAF) performance through detailed drone DEM survey 1 R. JENNINGS¹, E. PEARSON¹ & S. ROSE¹ 1 JBA Consulting Model-led design of Natural Flood Management measures increases their efficacy 2 E. PEARSON¹, R. JENNINGS¹ & S. ROSE¹ 1 JBA Consulting Opportunities for restoring natural process in heavily modified historic **Milling Systems** 3 W. CLARK¹, E. HOYLE¹ & J. SOWDEN 1 Cain Bio-Engineering Delivering bank softening solutions along the urban River Aire R. ING¹ & H. DODD SACHDEV¹ 4 1 Mott MacDonald Resilience under extreme water stress in Monterrey, Mexico 5 L. J. DE ROSENZWEIG¹ 1 Terra Habitus Understanding the geomorphic impacts of different Leaky Woody Dam (LWD) designs used in River Restoration 6 C. CARTER¹ 1 University of Hull, Environment Agency Levern Water river restoration 7 L. STEWART¹ 1 SEPA It's not just weir removal L. STEWART¹ 8 1 SEPA An Exploration of Engagement using Social Network Analysis 9 V. SMITH¹ 1 Arup **Chester Wetlands Centre: Feasibility and Detailed Design** 10 M. BOOTHROYD¹, N. HILL¹, H. REED¹ & J. HERRIOT¹ 1 Binnies



RRC Annual Conference

'An action strategy for river restoration'

19th – 20th April 2023

	Poster list CRC Press
11	Watery Wallington: Landscape-scale nature recovery in the upper Wansbeck catchment H. HAYDOCK ¹ , E. MORE ¹ , P. HEWITT ¹ & D. WISHART ¹ 1 National Trust
12	Hatchford Brook: Complications in Restoring an Urban Watercourse R. NEEDHAM ¹ , A. GRAHAM ¹ & R. THIRKELL ² 1 Trent Rivers Trust, 2 Envireau Water
13	GIS-based natural capital mapping in the Loddon catchment K. BAUER ¹ , A. PEARSON ¹ , P. TAYLOR ¹ & L. SYKES ¹ 1 South East Rivers Trust
14	Gravel bed river restoration: understanding the past to manage the future M. P. UNDERWOOD ¹ & J. MOON ² <i>1 Envireau Water, 2 Hydro-Morph</i>
15	Treasure in the hills: discovering the South East's lost chalk streams H. GRAY ¹ , C. GARDNER ¹ & P. TAYLOR ¹ 1 South East Rivers Trust
16	Wetting the Weald - demonstrating catchment solutions for water resources K. BAUER ¹ , T. HULL ¹ & N. HALE ¹ 1 South East Rivers Trust
17	Championing MoRPh Estuaries through Citizen Science G. WHARTON ¹ , L. SHUKER ² , T. MYERSCOUGH ³ & J. BRYDEN ⁴ 1 Queen Mary University of London, 2 Cartographer Studios Ltd, 3 Wyre Rivers Trust, 4 Thames21
18	Black Country Blue Networks: Delivery in a urban landscape T. A. HARTLAND-SMITH ¹ & K. N. ROBERTS ¹ 1 Severn Rivers Trust
19	River Lark Catchment River Restoration R. RIDDINGTON ¹ , F. HAINE ¹ & G. BOWLES ¹ 1 Stantec



Binnies is at the forefront of the development of innovative and sustainable water infrastructure and protecting and restoring the natural environment.

Our Sense of Purpose - enhancing lives, communities and the environment aligns with these most pressing challenges that our world faces.

We provide engineering excellence that preserves and enhances the environments in which we operate, whilst supporting the UN Sustainable Development Goals.

> We are creating a culture where innovation, continuous improvement and thought leadership shows no limits. It is our people who will create a future of positive influence.

> We are all capable of great things and when we work together we go from great to truly amazing achievements.

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Enhancing lives, communities and the environment

We are 🥝 ecosulis





Delivering Nature-Positive Solutions

We are dedicated to recovering nature, by designing and delivering efficient and scalable nature-based solutions for people and planet. We offer both consulting and practical services, with expertise in habitat creation and restoration.

We work with clients to identify nature-based solutions that deliver high biodiversity gains on sites across the UK and beyond, with minimal interventions. By crafting these solutions to fit the site, we cost-effectively deliver high quality results that stand the test of time.



Wetland & River Restoration



Ecosystem Analysis



Wetland Specialists

Experience of restoring river and ponds and creating new wetlands. Expertise in nutrient mitigation and NFM.



ICWs

Maintenance





Habitat Creation



Management Plans



Biodiversity Net Gain



Maximising Biodiversity

Minimising interventions while maximising biodiversity. Creating balanced, self-healing ecosystems.



Practical Restoration

Designing and delivering practical nature recovery projects. Creating costeffective nature-based solutions.











Smase



RRC Annual Conference *'An action strategy for river restoration'* 19th – 20th April 2023

Delegate list

As compiled on March 9th 2023

Kindly sponsored by:



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Rebecca Chiazzese Alex Clark Will Clark Caroline Clay Phoebe Clayson-Lavelle Jennifer Collins Kate Comins Lewis Coupland **Rich Cove** Dale Cox Maddie Crabb Tim Cross Jack Crowshaw **Charles Crundwell** Jo Cullis Sally Curran-Parry **Faye Cuthbert** Susan Dalziel * Will Davidson **Becky Davies Bella Davies** Jenny Davies Nicole Del Tedesco Kelly Ann Dempsey Ian Dennis Jacob Dew Shannon Dicks Oda Dijksterhuis * Naomi-Beth Dixon Kimberley Dodge Róisín Donovan Fran Dore **Alison Douglas** Peter Duffell Duncan Dumbreck Nicola Edgar **Richard Edwards** Lewis Elmes * Judy England Neil Entwistle Caroline Essery Peter Evoy **Chris Farmer Emily Farrell** Duncan Ferguson **Richard Fforde**

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Massimiliano Fini

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Text us with comments, questions, queries and suggestions throughout the conference

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