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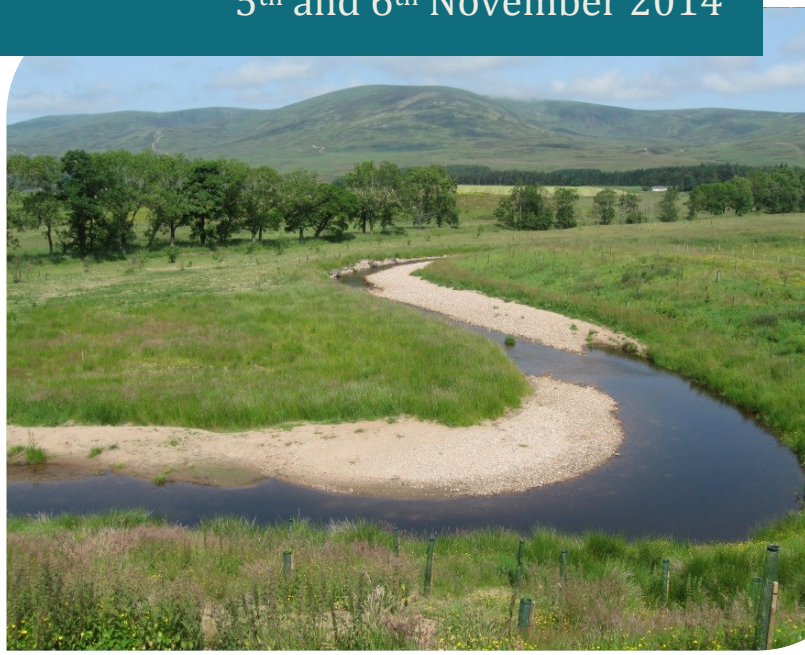
Scotland's centre of expertise for waters

IUCN NCUK River restoration & biodiversity expert workshop report

5th and 6th November 2014



IUCN | National Committee United Kingdom

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Cover photograph courtesy of: Stephen Addy (the Rottal Burn, Angus, Scotland in July 2013 after re-meandering was completed in August 2012)

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1.0 Executive summary

Background to research

Restoration of river habitats by restoring physical habitats offers significant opportunities for improvements to biodiversity. To date in the UK and Republic of Ireland (RoI) there have been many different examples and types of restoration work undertaken. Despite this progress there remain issues relating to the quality of the evidence base for restoration, its implementation and its promotion as a viable strategy to improve river biodiversity, ecosystem status and maintain the key services that we rely on.

To help promote river restoration throughout the UK and RoI, a three-phase project is being carried out with the support of the International Union for Conservation of Nature (IUCN) National Committee UK (NCUK). Phase 1 reviewed the literature on river restoration (Ecus Ltd., in press). As part of the second phase of the project, a workshop featuring the combined expertise of specialists in river restoration was held on 5th and 6th November 2014 in Liverpool to discuss:

1) The progress of river restoration in the UK and Ireland.
2) The evidence base for the effectiveness of restoration projects.
3) How the success of projects should be communicated.
4) The future directions and priorities for river restoration.

In total, 44 experts from 28 different institutions and groups attended. This document summarises the activities and discussions from the workshop.

Main findings

- To date, river restoration activity has mainly been driven by fishery interests with a smaller number of projects driven by interests in water quality, morphology, policy (e.g. Water Framework Directive) and wider social issues (e.g. managing flood risk). The majority of river restoration projects have been undertaken in lowland areas and in rivers with a low energy status.
- A key constraint on river restoration is the lack of an evidence base for its effectiveness. This is needed to help promote and inform its wider implementation. A further barrier is a lack of awareness of the purpose and need for river restoration. Pre-conceived perceptions within communities need to be challenged in order to gain support for projects.
- The value of monitoring is impaired by limited timeframes (typically <5 years), an under-appreciation of its importance as a key component of any restoration project and a lack of measurement of key factors (e.g. costs, social benefits and biological response). A greater commitment to robust monitoring over longer timescales that aims to measure the full range of costs, benefits and biophysical responses in selected 'flagship sites' would greatly improve the evidence base.
- Effective and early communication is important for gaining support from stakeholders to implement restoration projects. A range of education tools have been successfully used to gain project buy-in but there is a need to provide tangible incentives and, in some cases, negotiate to reach a compromise position.

- Combining an ecosystems services approach with the biodiversity conservation agenda may represent a way forward to strengthen the case for river restoration strategies.

2.0 INTRODUCTION

On the 5th and 6th November 2014, the International Union for Conservation of Nature (IUCN) National Committee UK (NCUK) invited 44 experts from the UK and Ireland to share their experiences and identify future directions for river restoration. The workshop formed part of Phase 2 of a three phase project that aims to promote river restoration in its role of conserving or improving biodiversity and ecosystem services in the UK and Ireland. The workshop was hosted and supported financially by IUCN NCUK and convened under the banner of the IUCN. The workshop organising group was Chris Mahon (IUCN NCUK), Phil Boon and Angus Tree (Scottish Natural Heritage) and Martin Janes (River Restoration Centre).

The delegates who attended the workshop (see Appendix I for full list of participants) came from a wide range of backgrounds, including academia, consultancy, government agencies, fishery boards and NGOs. Of the 44 that attended, 17 were from England, 14 from Scotland, 5 from Wales, 4 from Ireland and 4 from Northern Ireland. Over the two days, brief presentations and intervening discussions were themed around the following topics:

- Current state of river restoration in the UK and Ireland.
- The need and evidence for process-based restoration.
- How to improve understanding and evidence in those areas where there is still significant uncertainty.
- Measuring the success of river restoration projects.

The full programme of the workshop is shown in Appendix II and brief summaries of the presentations are given in Appendix III.

At the end of the workshop, participants offered position statements on a range of aspects of river restoration and these were put to the vote. The aim of this exercise was to determine the degree of consensus relating to implementation, the evidence base and how to proceed in the future. Section 3.5 and Appendix IV give the statements made and voting results. After the workshop, participants were given the opportunity to offer additional statements and vote on these.

3.0 WORKSHOP FINDINGS

3.1 State of current river restoration implementation

Current drivers of river restoration

- The main drivers for river restoration are:
    1. Scotland, England and Northern Ireland: improving fish populations and other flora and fauna, morphology, Water Framework Directive (WFD) classification and water quality.
    2. Wales: reducing flood risk.
    3. Ireland: improving the status of fish populations and water quality.
- Fish access and habitat improvement continue to be major drivers. Smaller numbers of restoration projects are being driven by water quality and wider social motivations, such as improvements for wildlife or creating more accessible natural areas in cities.
- Wider ecological and ecosystem motivations are emerging as important drivers but projects still tend to work at much smaller scales.

River restoration techniques

- River restoration in the UK and RoI is mainly undertaken in low altitude and low energy river systems.
- Early projects used engineering approaches that sought to recreate river form and tackle single problems. Projects today generally consider and aim to reinstate processes to produce multiple benefits.
- Process-based restoration has become the accepted best approach to river restoration and can be undertaken where a river has sufficient energy to realise its own improvement.
- Enhancements through re-sculpting work are still carried out where constraints are high or when specific opportunities exist. For example in the RoI where enhancement work for fisheries is undertaken as part of the maintenance of the artificial drainage network.

Planning river restoration projects

- There is no 'one size fits all' approach available for assessing river restoration actions. Walkover surveys and community consultation are needed in all cases to gather local knowledge and gain acceptance to inform restoration options.
- A recent Europe wide study of river restoration (REFORM) showed that few projects had well defined endpoint criteria. River restoration goals must be carefully set at the outset so they are well defined, achievable and possible to evaluate at the end of a project.
- Setting certain goals – for example, decreasing flood risk and erosion risk – may be easier than setting wider ecosystem services goals.

The evidence base for river restoration

- European studies have demonstrated positive relationships between river restoration actions (e.g. large woody material, buffer strips) and biodiversity in some cases, but the majority of studies suggest limited or no significant benefit.
- REFORM European wide river restoration study: river restoration project success rates of 23.7% (biological), 9.96% (morphological) and 3.6% (physio-chemical) were reported. For each of these categories, 70-80% projects had no monitoring or evaluation information available.
- In the UK and RoI there are examples of ecological recovery in response to water quality improvement but few relevant to physical habitat restoration.

Practical constraints

- Ideally, physical restoration must be preceded by improvements in water quality as the benefit of physical improvement may be negated by water quality pressures.
- In lowland river restoration projects, there are potential pitfalls of high sedimentation rates that may overwhelm any improvements in morphology and difficulties of altering channel slope due to human constraints.
- Urban river systems can respond rapidly following restoration work but it may be difficult to improve ecological status (e.g. WFD objectives of good ecological status/potential) because of the severity of pressures in these settings.

Regulation and funding constraints

- To attract funding for river restoration implementation (e.g. in Northern Ireland) there is a need to demonstrate that restoration achieves more than just the improvement of biodiversity.
- Gaining consent from statutory bodies (e.g. Environment Agency) for river restoration is often demanding, costly and requires too much detail.

Social constraints

- The implementation of river restoration fundamentally depends on the support of local communities.
- We have grown accustomed to engineered and managed rivers, therefore alternative management and river restoration may not be seen as required until an unwanted issue arises that threatens communities.
- A major challenge is that powers to make landowners improve areas of historic degradation are limited. In Scotland, the Flood Risk Management Act (2009) allows local authorities to undertake compulsory purchase of land which could, in rare cases, facilitate restoration work if it is of benefit for flood risk management.

3.2 Monitoring river restoration projects

Challenges

- Typically, monitoring is undertaken over short time frames of 3-5 years. Reliable detection, especially of ecological change, may be impaired since recovery may lag behind the completion of physical habitat improvements.
- During a monitoring period there may be confounding factors at work, so detecting the effects of river restoration measures is often difficult.
- We need to know the costs and benefits of river restoration projects to attract the funding to undertake restoration elsewhere, but this information is often lacking.
- Focused monitoring is difficult if expecting many benefits or if unexpected benefits appear.
- Ecological indicators – for example, macroinvertebrate indices – are not sufficiently developed to be reliably sensitive to changes of physical river conditions in contrast to those developed for measuring water quality improvement.
- A lack of funding, especially for post-project monitoring, because of 1. under-appreciation of the importance of monitoring; 2. lack of strategic will; 3. lack of funds; 4. opportunistic nature of some river restoration projects limiting preparation for monitoring.

Possible future directions

- Because of the costs of monitoring, aim to concentrate on several key 'flagship' sites for robust scientific monitoring beyond five years and consider the use of cheaper, easier methods at other sites – for example, River Habitat Survey (RHS), System for Evaluating Rivers for Conservation (SERCON) and citizen science approaches.
- Quantify the full benefits, ecosystem services and costs of river restoration to attract future funding and aid promotion.
- Set specific monitoring objectives and monitor measureable aspects.
- Increase the evidence base to include a greater range of river types, environments (including floodplains), scales, and biota other than fish and macroinvertebrate assemblages.
- Re-assess why past projects succeeded or failed based on more recent understanding of natural processes.

3.3 Communicating river restoration

Problems

- Scientific findings are sometimes lost in translation because of the way science is communicated to the general public e.g. too much terminology within a report for the target audience.
- Rivers are inherently interesting for river specialists, but to attract wider support there is a need to associate rivers with something that is of tangible interest and benefit to the public.
- A lack of understanding about river restoration, pre-conceived images and politics may perpetuate 'myths' of river functioning (e.g. 'meanders only exist in the lowlands') that could lead to project rejection by some communities.

- Changing the culture of river restoration practitioners (e.g. digger drivers) may be difficult if they have been shaped by another work culture (e.g. drainage maintenance).
- Practitioners need to be properly informed of the requirements of any particular river restoration project on which they are embarking.
- A lack of community involvement and support from the outset (e.g. River Cole restoration project) may jeopardise acceptance of river restoration work undertaken and limit future funding.
- Discussion of project failures is rare perhaps because of a fear of alienating people.

Current successful communication approaches

- Early and long-term involvement of the community (e.g. River Skerne restoration project) is vital to ensure project acceptance, to maximise the use of local knowledge, to inform the public on the benefits of river restoration and to help promote future river restoration projects.
- Employing a trusted intermediary (e.g. catchment management partnership, river trust) between the practitioners and the local community without the expectation of action being taken until support has been secured.
- Using the following to communicate the vision of river restoration to stakeholders has been successful:
    1. River site visits to help educate and allay concerns.
    2. Appropriate pictures and diagrams (both conceptual and data based).
    3. Physical 3D models (e.g. Tweed Forum catchment model http://tweedforum.org/research/catchment_model) and portable flumes (e.g. Emriver; http://www.emriver.com/).
    4. Using 'iconic species' to 'badge' river restoration projects as a means of promoting the concept for those who might not understand the other benefits of river restoration.

Challenges and potential avenues for future communication

- Practitioners and academics have neglected the need to compromise over proposed river restoration actions. A willingness to negotiate to reach acceptance and a consensus from the public is required. At the same time it is necessary to state clearly which parts of the scientific message are non-negotiable.
- Consider providing a clear motivation to stakeholders for river restoration action, for example communicating potential tangible benefits such as reducing downstream flood risk.
- Communicating and discussing more openly both successes and failures to aid 'learning by doing'.
- Communicating information to the people politicians talk to as well as river managers to help shape future policy.
- Consider appointing a PR or media specialist to help promote river restoration.

3.4 Supporting and implementing river restoration in the future

Supporting science needs

- Aside from the need for further monitoring (see above), efforts must be made to support key areas of scientific understanding that strengthen the evaluation and justification of river restoration, specifically:
    1. Continued research of biophysical linkages to understand how alterations (especially to physical conditions) created by river restoration will affect biota.
    2. Understanding linkages between biodiversity and ecosystem services to predict potential return on investment for public funding.
    3. Producing reliable biological indicators of physical change.

Future goals and the process of implementing river restoration projects

- Simple but achievable and measureable targets may make it easier to promote river restoration to the general public and funders – for example, by using guiding images and simple singular aims such as increasing habitat area through re-meandering.
- The REFORM study emphasises that successful river restoration projects need:
    1. To capture risks and uncertainties.
    2. To consider efficacy in different river styles.
    3. To recognise biological responses have long timescales.
    4. Tools that account for social–ecological coupling.
    5. Tools for managing expectations and describing milestones and include timescales.

Future strategies for implementing river restoration

- A 'bottom-up' approach of empowering sympathetic landowners with cheap, quick and 'no-regrets' options may speed up the process. Examples include selective breaching of flood levee defences to improve floodplain connectivity and letting the natural energy of the river system complete the restoration process.
- Broadening the extent of river restoration by including it within a strategy that strives for restoration at the scale of whole environments may help to maximise the benefits by tackling extensive pressures.
- Balancing the need for the benefits of the conservation and restoration of key ecosystem services (e.g. carbon storage, water quality and fisheries) against food production and with the overriding pressure of climate change, will be a major challenge. One approach will be to strive to increase restoration efforts in some areas to allow intensification of production in others. Such an approach will lead to conflict and trade-offs but a payment for an ecosystem services approach may represent a way forward.
- Combining ecosystem services and valuation approaches as an adjunct to efforts to conserve and enhance biodiversity may help to promote and attract funding to implement river restoration as part of the larger landscape restoration initiative.
- Communicating the added value of river restoration may be achievable through considering, for example, the flood risk management benefits of such action. SEPA is currently demonstrating the potential dual benefits of river restoration for river ecosystems and flood mitigation through the Pilot Catchment project.

- Re-introduction of the beaver as a key ecosystem engineer has been promoted as a method to initiate restoration of natural processes in the UK but the feasibility of re-introduction has been refuted by some (e.g. constraints of lack of woodland, space, adequate water quality and landowner agreement).

Future policy, incentives and regulations for supporting river restoration

- A drive for better policy will change regulations and incentives to implement river and wider environmental restoration. Reallocation of funds or the funding of new resources will be required to make this happen.
- Agricultural schemes (e.g. SRDP in Scotland and Environmental Stewardship scheme in England) are one way to help implement large scale restoration. However, making it viable for landowners is difficult. For example, measures such as riparian enhancement represent a permanent style of land-use change for which farmers only receive temporary funding.
- In the case of the Environment Agency, new Environmental Permitting Regulations are being devised to streamline and simplify the process of implementing river restoration.
- Greater regulations and powers (e.g. especially in Wales) to enforce the conservation of rivers would help to stem their degradation and in turn reduce the need for restoration.
- There is potential to obtain more funding from other sources. For example, water companies might fund restoration if it can be demonstrated that water quality can be improved, thereby reducing treatment costs.

3.5 Position statements

Overall most statements attracted a clear majority in agreements, with few disagreeing but often with around 1/3 abstaining. It is assumed that people did not abstain due to disagreement. We concluded that in these cases participants either did not have a strong view one way or the other, or that the statement may have been unclear or in several parts.

Setting the scene

All of those who voted agreed that 'there is evidence of widespread damage to rivers across the UK and Ireland thus emphasising the need for a strategic approach to river restoration'. However 1/3 of the group abstained. The fact that no-one disagreed with the statements suggests that it was the link to the need for a strategic approach.

Ecosystems approach

There was strong support for the use of an ecosystem services approach to complement biodiversity conservation in river restoration.

Regulations

All who voted agreed that better regulations and incentives are needed for river restoration.

Links to other plans and priorities

It was proposed that National Biodiversity Action Plans should be reflected in river restoration plans. However, the majority of the group abstained suggesting that many could not see how this could be achieved, rather than disagreeing with the premise.

The majority agreed with a need for projects targeted at making improvements for iconic species such as the freshwater pearl mussel, although four disagreed. The majority also agreed that such species can be useful flagships for promoting the purpose and concepts of river restoration.

Funding and incentives

There was strong agreement on the need for long-term funding. It was also agreed that there should be encouragement for land managers to undertake river restoration by promoting the opportunity to reduce costs to the business.

Communication

Several statements relating to an overall need for better communication at all levels, including between practitioners, were agreed on by all. A need to better understand people's motivations for supporting river restoration projects was also proposed.

Evidence and monitoring

The need to develop an improved evidence base using the best available science was agreed. The majority agreed that two scales of monitoring are required – the implementation of a strategic and long-term programme of research, complemented by simple and targeted monitoring for individual projects. The group was split on the current level of confidence in our knowledge about relationships between habitats and biotic requirements. It was agreed by a strong majority that statutory monitoring may not be sufficient to measure the successes or failures of river restoration schemes.

Scales and scope

There was strong agreement that a range of scales must be considered in river restoration. This includes lateral connectivity, consideration of changes through time and the range of bio-physical processes that should be considered.

Vision

Looking to the future, the group agreed that restoration should be seen not just as a means of replacing lost environments but as a means of protecting key resources against future change. It was proposed that the concept of a 'guiding image' should be used to provide a target for restoring rivers and for visualising and monitoring river restoration schemes, but the majority abstained from this vote.

Terminology

The group agreed that the use of the term 'woody debris' is not an appropriate term to describe wood in rivers. Alternatives suggested included simply 'wood', 'dead wood' or 'woody material'.

Partnership working

It was agreed that there is a need to identify synergies between different sectors in order to maximise the success of river restoration projects.

4.0 CONCLUSIONS

By bringing together leading experts from the UK and Ireland, the workshop provided a constructive opportunity to gain insights from a range of perspectives on the progress of river restoration, current constraints and future opportunities.

Participants described the progress that has been made from applying form-based, engineering techniques to those that consider processes, the multiple benefits and 'quick-wins' of physical restoration measures such as weir removal, and the recent positive biological response to water quality improvements in UK rivers. Experiences were shared on findings from existing restoration projects, future projects, datasets and communication tools such as 3D physical models to explain river functioning.

A number of issues were raised about the current state of river restoration. Projects are being undertaken on a small scale (i.e. reach) and are piecemeal rather than tackling the problems at the scale at which they exist, they are often poorly monitored and lack goals that are tangible to society. This means that the full range of potential benefits are not being realised through restoration. Constraints cited included cost, lack of community support due to a lack of education or incentives, and the prohibitive nature of some regulations.

Suggestions to support wider promotion and funding of river restoration included:

- Improving the evidence base through robust, long-term monitoring at 'flagship sites' that also includes the quantification of ecosystem services accrued by restoration. To complement this, cheaper, simpler monitoring methods were advocated at other restoration sites.
- Communicating more effectively to stakeholders the merits of river restoration to allay concerns and provide incentives to encourage support – for example, reduced flood risk to properties. It was recognised that in some instances negotiation is needed to reach a compromise where stakeholder backing is problematic.
- Streamlining regulation procedures and making bottom-up, small-scale and low-cost approaches to restoration more viable for sympathetic landowners.
- Using alternative sources of funding such as water company funds with the incentive that restoration will reduce treatment costs.
- Presenting river restoration as policy relevant to engage with politicians and attract funding.

Discussions of the future direction for river restoration included a need for improved legislative powers to help enforce the protection of rivers from degradation. This would help to conserve river habitats and biodiversity and reduce the need for river restoration in the future.

A future need for openness among practitioners to exchange knowledge of project successes and failures was also emphasised. The workshop itself contributed to this aim, with information being shared on new projects, available datasets, and communication tools. Such knowledge sharing will greatly aid the process of 'learning by doing' needed to improve the evidence base and strengthen the case for river restoration.

5.0 APPENDICES

Appendix I: List of participants

Name	Affiliation	Country
Ian Morrissey	Atkins Global	England
Judy England	Environment Agency	England
Glenn Maas	Environment Agency	England
Helen Reid	Environment Agency	England
Paul St Pierre	Environment Agency	England
Ian Cowx	University of Hull International Fisheries Institute	England
Chris Mahon	IUCN NCUK	England
Nicholas Clifford	Kings College London	England
Chris Mainstone	Natural England	England
Jenny Wheeldon	Natural England/Environment Agency	England
Dave Gilvear	Plymouth University	England
Martin Janes	River Restoration Centre	England
Alistair Maltby	The Rivers Trust	England
Malcolm Newson	Tyne Rivers Trust	England
Terry Langford	University of Southampton	England
Marc Naura	University of Southampton	England
Fiona Bowles	Wessex Water	England
Jake Gibson	Department of Environment	Northern Ireland
Mary Toland	Department of Environment	Northern Ireland
Judith Bankhead	Rivers Agency	Northern Ireland
Gareth Greer	Rivers Agency	Northern Ireland
Alan Cullagh	Inland Fisheries Ireland	Republic of Ireland
Karen Delanty	Inland Fisheries Ireland	Republic of Ireland
James King	Inland Fisheries Ireland	Republic of Ireland
Gerry McCafferty	Inland Fisheries Ireland	Republic of Ireland
Hamish Moir	cbec Eco-engineering UK	Scotland
Simon McKelvey	Cromarty Firth Fisheries Trust	Scotland
Kenny MacDougall	Envirocentre Ltd	Scotland
Stuart Brooks	IUCN NCUK/The John Muir Trust	Scotland
Steve Addy	James Hutton Institute/CREW	Scotland
Susan Cooksley	James Hutton Institute/CREW	Scotland
Nikki Dodd	James Hutton Institute/CREW	Scotland
Roberto Martinez	Scottish Environment Protection Agency	Scotland
Phil Boon	Scottish Natural Heritage	Scotland
Kath Leys	Scottish Natural Heritage	Scotland
Angus Tree	Scottish Natural Heritage	Scotland
Hugh Chalmers	Tweed Forum	Scotland
Chris Spray	University of Dundee	Scotland
Nigel Willby	University of Stirling	Scotland
Steve Ormerod	Cardiff University	Wales
Catherine Duigan	Natural Resources Wales	Wales
Tristan Hatton-Ellis	Natural Resources Wales	Wales
Dave Johnston	Natural Resources Wales	Wales
Oliver Lowe	Natural Resources Wales	Wales

Appendix II: Workshop agenda
RIVER RESTORATION AND BIODIVERSITY: A workshop organised by IUCN NCUK, University of Liverpool, 5-6 November 2014

Wednesday 5 November

13.30-13.35 – Welcome by Stuart Brooks (Chair, IUCN UK National Committee)

13.35-13.45 – Workshop introduction: Phil Boon (Scottish Natural Heritage)

Workshop session 1: Progress in restoring rivers in the UK and Ireland

13.45-13.55 – Introduction to session 1: a summary of Phase 1 conclusions: Martin Janes (River Restoration Centre)

13.55-15.00 – Short informal presentations, each followed by discussion:

1. Chris Spray (University of Dundee)
Why organisations do river restoration

2. Alastair Maltby (The Rivers Trust)
Are you sure? The challenge of linking river restoration activities, biodiversity outcomes, and financial mechanisms

3. Jenny Wheeldon (Natural England)
Restoring river SSSIs in England

4. Dave Gilvear (University of Plymouth)
Progress in river restoration in Scotland over the past 25 years

5. James King (Inland Fisheries Ireland presenting on behalf of Nathy Gilligan, RoI)
Restoring rivers in the Republic of Ireland for their biodiversity

15.00-15.30: General discussion

Workshop session 2: The need and evidence for process-based river restoration projects

15.50-16.00 – Introduction to session 2: a summary of Phase 1 conclusions: Steve Addy (James Hutton Institute)

16.00-17.00: Short, informal presentations, each followed by discussion:

1. Nick Clifford (King's London)
Trends in river restoration over the past 20 years

2. Helen Reid (Environment Agency)
Improving communication of the evidence base for restoring dynamic rivers in Cumbria

3. Kenny MacDougall (EnviroCentre Ltd)
Design, construction and monitoring of the Rottal Burn restoration scheme

17.00-17.30: General discussion, including comments on relevant sections of Phase 1 report

Thursday 6 November

Workshop session 3: How to improve understanding and evidence in those areas where there is still significant uncertainty

09.00-10.00: Short, informal presentations, each followed by discussion:

1. Malcolm Newson (Tyne Rivers Trust)
Engaging stakeholders with hydromorphology: refuting the myths

2. Hamish Moir (cbec eco engineering)
Restoring natural geomorphic process to river environments influenced by practical design constraints

3. Steve Addy (James Hutton Institute)
Monitoring the physical response to river restoration

10.00-10.30: General discussion

Workshop session 4: Measuring the success of river restoration projects

10.50-11.45: Short, informal presentations, each followed by discussion:

1. Terry Langford (University of Southampton)
On the need for simple indices for assessing restoration success

2. Ian Cowx (University of Hull)
Measuring success of river restoration actions using end-points and benchmarking

3. Steve Ormerod (Cardiff University)
The ecology of restoration and recovery: a high-level view

11.45-12.15: General discussion

12.15-12.45: Summing up, and proposals for Phase 3

12.45: Lunch and depart

Appendix III: Summaries of presentations

Stuart Brooks (IUCN chairman) – Welcome from IUCN UK National Committee
Provided an overview of the remit of the IUCN NCUK, which includes engaging in global political activities and working with government and NGOs. Described three IUCN projects: Putting Nature on the Map, Peatland project and the River Restoration and Biodiversity project.

Phil Boon (SNH) – Workshop introduction
Summarised background to the IUCN river restoration and biodiversity project and stated the aims of the workshop.

Martin Janes (River Restoration Centre) – Introduction to session 1: a summary of Phase 1 conclusions
Summarised Phase 1 report conclusions on assessment of physical damage and drivers of river restoration. For Scotland, England and Northern Ireland, the main drivers were improving the status of fish populations, morphology, biology, WFD classification and water quality; for Wales, reducing flood risk, and; for RoI, improving the status of fish populations and water quality.

Chris Spray (University of Dundee) – Why do organisations do river restoration?
Stated that the balance of services as the desired end state of a project (i.e. following restoration actions and recovery) is a societal construct; different groups carry out river restoration for different reasons, depending on their remit and interests. Emphasised that where we can bring groups together (a multi-approach) we may get multi-benefits, and that local community engagement is key to the success of river restoration projects.

Alastair Maltby (The Rivers Trust) – Are you sure? The challenge of linking river restoration activities, biodiversity outcomes, and financial mechanisms
Gave an overview of The Rivers Trust (a total of 53 trusts exist in England, Wales and Northern Ireland; 28 exist in Scotland under RAFTS; and 3 proto-trusts exist in RoI) and the major drivers for river management: water provision, waste water treatment, flood risk reduction, urban development and agriculture. Provided examples of opportunities and finance that could be mobilised for catchment water management; referred to bathing water and water treatment costs in the North West of England.

Jenny Wheeldon (Natural England) – Restoring river SSSIs in England
Provided an overview of the long-term, whole-river restoration approach to designated rivers adopted by Natural England since 2005, which is focused on strong stakeholder engagement, low level intervention and allowing natural recovery whenever possible.

Dave Gilvear (University of Plymouth) – Progress in river restoration in Scotland over the past 25 years.
Summarised change in river restoration approach from engineering and re-sculpting to process-based approaches. Stressed that monitoring has not yet produced a clear understanding of the benefits and magnitude of change created by restoration and highlighted the importance of longer monitoring programmes, quantification of linkages between river restoration and increase in ecosystem services, and of bridging the gap between academia and river restoration practitioners.

James King (Inland Fisheries Ireland) – Restoring rivers in the Republic of Ireland for their biodiversity
Described the nature and extent of arterial drainage in RoI following WW2, and the provision for continued channel maintenance (undertaken by The Office of Public Works). Explained that the challenge in RoI has been to carry out proactive work in these channels to maintain and enhance

habitat conditions for fish through altering river-bed profiles and creating physical heterogeneity while maintaining the drainage function of the channels.

Steve Addy (James Hutton Institute) – Introduction to session 2: a summary of Phase 1 conclusions
Highlighted report findings that few studies assess both physical and ecological response to river restoration; active restoration usually results in improved habitat diversity but does not necessarily equal improved diversity of biota. Stated need to improve evidence base of process-based river restoration across multiple river types and scales, produce biological indicators of physical modification, and to target key pressures to instigate recovery.

Nick Clifford (King's London) – Trends in river restoration over the past 20 years (focused on the UK)
Noted increase in river restoration as an academic pursuit. Raised points that rise of ecological and ecosystem drivers for restoration are not matched by the scale of our ambition, altitude of most river restoration projects is low and systems tend to be low energy, and wide ecosystem service goals may not be achievable. Highlighted the need for achievable, specific project goals, consideration of sediment transport rates and learning from existing data to improve current practice for different intervention types.

Helen Reid (Environment Agency) – Improving communication of the evidence base for restoring dynamic rivers in Cumbria
Highlighted the need to tailor communication to the specific target audience(s) e.g. the public, digger drivers, etc. to enable application of process-based science. Advocated use of real data and portable flumes to communicate concepts and sympathetic management.

Kenny MacDougall (EnviroCentre Ltd) – Design, construction and monitoring of the Rottal Burn restoration scheme
Noted difficulties in dealing with uncertainty in physical processes, how far along you take the investigation of natural processes and of communicating technical aspects to the public and landowners. Described the effects of a 1 in 10 year flood shortly after restoration of the Rottal Burn. Questioned whether innovative approaches to river restoration are being disseminated, and whether results of monitoring are being used to improve methods.

Malcolm Newson (Tyne Rivers Trust) – Engaging stakeholders with hydromorphology: refuting the myths
Spoke about the problems of educating stakeholders on the key concepts in river science in order to refute several 'myths' of river functioning that can present a major obstacle to gain community acceptance of river restoration projects and sympathetic river management. Village hall meetings, site visits, portable flumes and short briefings on key concepts have been used to educate and allay the concerns of stakeholders. Highlighted a need to develop appropriate tools to inform actions but also underlined the importance of walkover surveys to understand the particular river context.

Hamish Moir (cbec eco engineering) – Restoring natural geomorphic process to river environments influenced by practical design constraints
Summarised the range of restoration styles that are influenced by the degree of physical constraint and geomorphic dynamism. Range from 'assisted recovery' (e.g. Allt Lorgy scheme), to 'initial conditions design' (e.g. Eddleston Water) and 'functional design' (e.g. Mains of Dyce channel). Emphasised the need for understanding and appreciating risks in river restoration projects, using science to inform river restoration design, carrying out post-intervention monitoring and the lack of restoration actions tackling pressures outside the river corridor.

Steve Addy (James Hutton Institute) – Monitoring the physical response to river restoration
Spoke about the need for furthering understanding of geomorphic changes (styles, directions and magnitude of changes) in a greater range of river styles and restoration types. Also highlighted the role that advanced monitoring methods (e.g. use of UAV-based remote sensing) combined with cheaper, quicker methods play in broadening the evidence base.

Terry Langford (University of Southampton) – On the need for simple indices for assessing restoration success
Suggested that ignorance of ecological responses in restoration projects was due to a lack of simple targets, clear methods and indicators that are understandable to non-specialists. Believes lack of monitoring of geomorphology and ecology is probably because proponents of restoration don't want to know. Stated that ecology is often used as a 'smokescreen' to implement potentially controversial flood prevention schemes as conservation projects.

Ian Cowx (University of Hull) – Measuring success of river restoration actions using end-points and benchmarking
Summarised findings from a European wide review of river restoration (REFORM project) that included 671 case studies. Showed that monitoring is rarely quantitative with a lack of information on costs and benefits. Highlighted the importance of robust restoration project planning that considers risks, uncertainties, clear successes and outcomes.

Steve Ormerod (Cardiff University) – The ecology of restoration and recovery: a high-level view
Demonstrated the successful recovery of river biota to improvements of water quality in England and Wales between 1991 and 2008. Showed that some species in rural environments are in decline perhaps due to pressures of temperature rise and nutrient input. Outlined a major new research initiative that aims to examine the links between biodiversity and key ecosystem services provided by rivers (fisheries, clean water, birds for their cultural value).

Appendix IV: Agreed position statements and voting results.

Position statement			
Setting the scene			
There is evidence of widespread damage to rivers across the UK and Ireland, thus emphasising the need for a strategic approach to river restoration.			
Ecosystems approach			
An ecosystem services approach is needed to complement biodiversity conservation in river restoration but should not replace it.			
Regulations			
Better regulations and incentives are needed for river restoration.			
Links to other plans and priorities			
National Biodiversity Action Plan should be reflected in river restoration plans.			
We recognise the need for specific restoration projects to safeguard 'iconic' species.			
'Iconic' species can be useful vehicles for promoting river restoration concepts and projects.			
Funding and incentives			
River restoration projects require long-term funding.			
Businesses should be encouraged to explore options for river restoration that can reduce their costs while aiding natural processes.			
Communication			
We need to communicate which river restoration techniques are effective for achieving different goals.			
We need to learn from and share our failures in river restoration.			
River restoration needs a Government champion.			
To achieve river restoration benefits we need to understand the behaviour and motivation of people.			
To influence politicians, landowners, and the wider public we need to demonstrate and communicate that river restoration outcomes are beneficial.			
River restoration should always be discussed in the context of the whole catchment because this brings multiple benefits.			
Evidence and monitoring			
We need to ensure that we always use the best science for river restoration.			

We have sufficient confidence in what we know about the relationships between habitats and biota to help carry out and 'sell' river restoration.			
There is a need for a research approach to detailed, strategic, focused and long-term monitoring.			
There is a need for clear, simple and targeted monitoring before and after river restoration projects.			
It should not be assumed that statutory monitoring will be sufficient to measure the successes or failures of river restoration schemes.			
Scales and scope			
Lateral connectivity, including floodplain and riparian zones, should be considered more explicitly in river restoration.			
We should recognise that the results of river restoration are scale-dependent, both in space and time.			
Both physical and biological processes should be considered in river restoration.			
Vision			
Restoration should be seen not just as a means of replacing lost environments but as a means of protecting key resources against future change.			
The concept of a 'guiding image' should be used to provide a target for restoring rivers and for visualising and monitoring river restoration schemes.			
Terminology			
'Woody debris' is not an appropriate term.			
Partnership working			
Synergies between different sectors need to be identified to maximise the success of river restoration.			

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