

River Restoration Workshop 2

River naturalisation - background and workshop aims

The Water Framework Directive objectives require the restoration of river process as well as river form. Too often in the past, river restoration has engineered form without process or has utilised artificial structures to mimic natural morphology. It has also suffered from an emphasis on restoring for channel stability when all river systems should be naturally dynamic. This workshop session attempted to synthesise past approaches and lessons learned to date regarding restoring both river and floodplain form and process, focusing on the following key areas:

- Type of river on which measures have been tried
- Background information used to define a restoration methodology
- Restoration methodologies adopted
- River response to restoration and whether this was as desired
- Lessons learned - ways to improve methods for the future
- Other useful information including Contractors, EA contacts etc.



Workshop outcomes in summary...

Understanding the interactions between geomorphology (i.e. the physical processes in rivers), river dynamics and ecology are key aspects of river naturalisation. Of the four workshops, the river naturalisation session proved to be the most challenging in terms of our appreciation of the in-channel river morphology and our ability to assess what naturalisation is appropriate where. The question we focused on, which we felt is fundamental for successful river naturalisation, was "What are we restoring to?". In our answer we collectively produced a list of morphological, flow regime related and ecological features that we see

as the key elements of river naturalisation in different river systems.

Our discussions showed that the majority of river naturalisation projects have been undertaken in passive and active single-thread river reaches. We see river naturalisation as a way of re-creating natural processes, enhance self-sustainability of rivers, enhancement of biodiversity, connectivity and river dynamics. Using historic information, photography and mapping can help us with understanding how our rivers work. River naturalisation can easily be

perceived as a return to a 'no human intervention' state. However, we have recognised that this is a misleading concept, because people and their activities have historically been part of landscapes just as rivers have been. Working with natural processes to help create self-sustainable, dynamic river systems is therefore what we would call river naturalisation. However, as one of the attendees put it: "River is the boss".

In the following pages we present the key outcomes of this workshop session, including more detailed statistics.

River naturalisation – our view

What is naturalisation?

We understand river naturalisation as:

- Restoring/improving biodiversity
- Removal of man-made structures
- Supporting dynamism (erosion & deposition)
- Supporting natural processes (flow & sediment)
- Connectivity
- Self-sustainability
- No human intervention
- Reinstatement of features
- Restoring within historical context

What methods do we use?

Depending on the type of rivers, processes and issues, we:

- Remove structures
- Improve flow conveyance
- Enhance erosion and deposition
- Create habitats and enhance biodiversity
- Reconnect floodplains
- Change channel width

What are we restoring to?

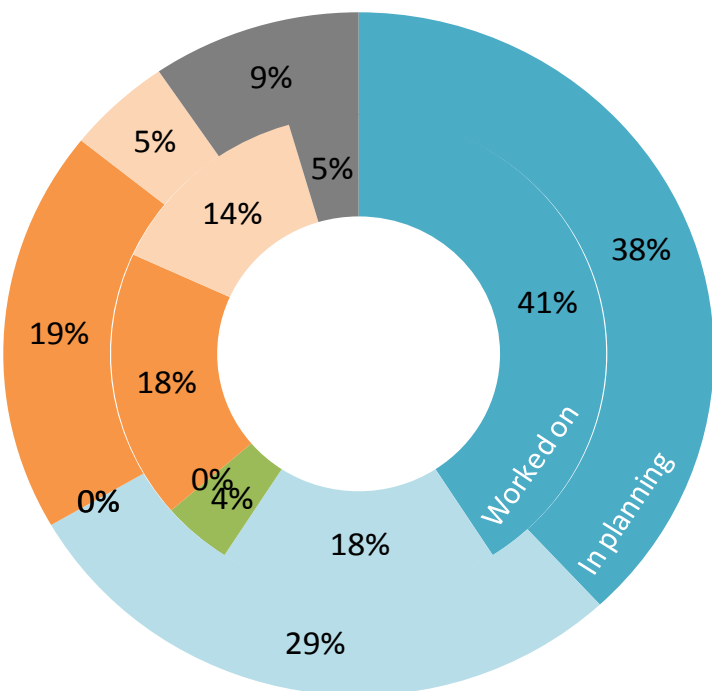
We discussed the kind of morphological, flow regime and ecological processes we understand see as dominant in different types or river reaches, including bedrock dominated, step-pool, pool-riffle, braided, wandering or active and passive single-thread river sections. To what degree do we let this understanding govern our river restoration projects, how do we understand our river systems?



- Create lateral and point bars, islands, berms
- Re-profile meanders, banks
- Introduce woody debris, pools and riffles, boulders

River reaches we worked on and are planning

Our experience shows that about 60% of river naturalisation projects were undertaken for passive and active single-thread rivers and the trend remains for the planned projects too. We have also worked in pool-riffle and bedrock influenced river systems and the planned work will also include step-pool, braided and wandering rivers.



- Passive single-thread
- Active single-thread
- Wandering
- Braided
- Pool-riffle
- Step-pool (pool-rapid)
- Bedrock influenced

River naturalisation - our view

Lessons learnt - what we know and still don't know in river naturalisation projects

Lessons learnt	Gaps to fill
Ensure your restoration design is appropriate for the river type	Not enough experience often leading to inappropriate design with regard to processes; opportunities not always maximised
Recognise natural opportunities - leave your desk and walk the river (not only the reach you are working in - inspiration may lie upstream or downstream)	Understand your river and the processes. The river could reject the naturalisation measures. 'Rivers do what they want, not what you assume them to do'.
Understand the wider context - understand your catchment and the flow regime	Differing views on what is appropriate and valuable naturalisation. Our efforts are not always helpful.
Set up long term monitoring to be able to evaluate success later	Evidence of the degree of success. Ensure the funding extends to monitoring.
Be aware and work with knock-on effects e.g for bird populations, landscape, people.	Problems with contamination. It is important to know about bank material, invasive species, protected species and similar before work commences
Try to promote regeneration of the whole area, not only the river.	Keep lid on scope to keep healthy, constructive communication with engaged groups and to avoid too many conflicting opinions, which add extra unplanned work and delays.
Engagement with communities and interest groups helps make your work success.	Be prepared to deal with landowner approval problems.
Use digital terrain model, historic and other data in your design	Promote partnership and team building with the contractor at early stage.
Good relationships mean good results (clients, consultants, constructors, community).	Ensure statutory consents are in applied for at an early stage, they could take a long time to be granted.
The river is the boss. Work with it, not against it.	There are no absolute answers to what naturalisation should be done where.
When planning the restoration work, don't forget to consider weather.	Weather can delay projects; make your programme flexible.