VALUING NATURE

The natural capital of temporary rivers

Characterising the value of dynamic aquatic-terrestrial habitats

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Background.

Introducing temporary rivers

T-rivers are:

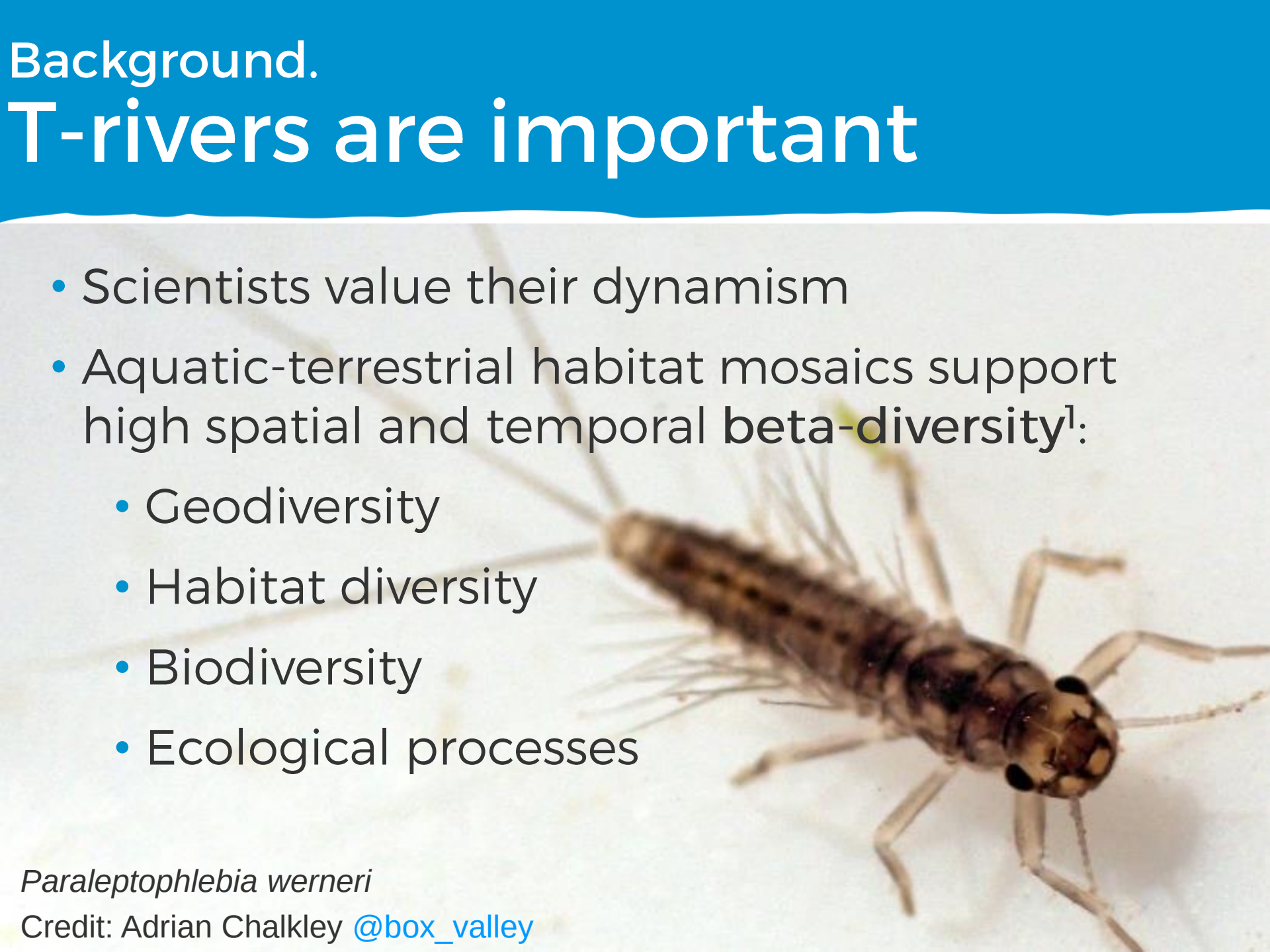
- Rivers; sometimes cease to flow and may dry
- Dendritic **channels**; sometimes inundated
- Aquatic-terrestrial **ecosystems** characterised by dynamism
- **Natural** (can also be artificial, or perennialised)

Photos: Thibault Datry (b–d) / Roland Corti (a, e, f). Reproduced with permission from https://doi.org/10.1093/biosci/bit027

Background.

T-rivers are important

- Scientists value their dynamism
- Aquatic-terrestrial habitat mosaics support high spatial and temporal **beta-diversity**[1]:
  - Geodiversity
  - Habitat diversity
  - Biodiversity
  - Ecological processes



Paraleptophlebia werneri

Credit: Adrian Chalkley @box_valley

Background.

T-rivers are important

- Ecological processes

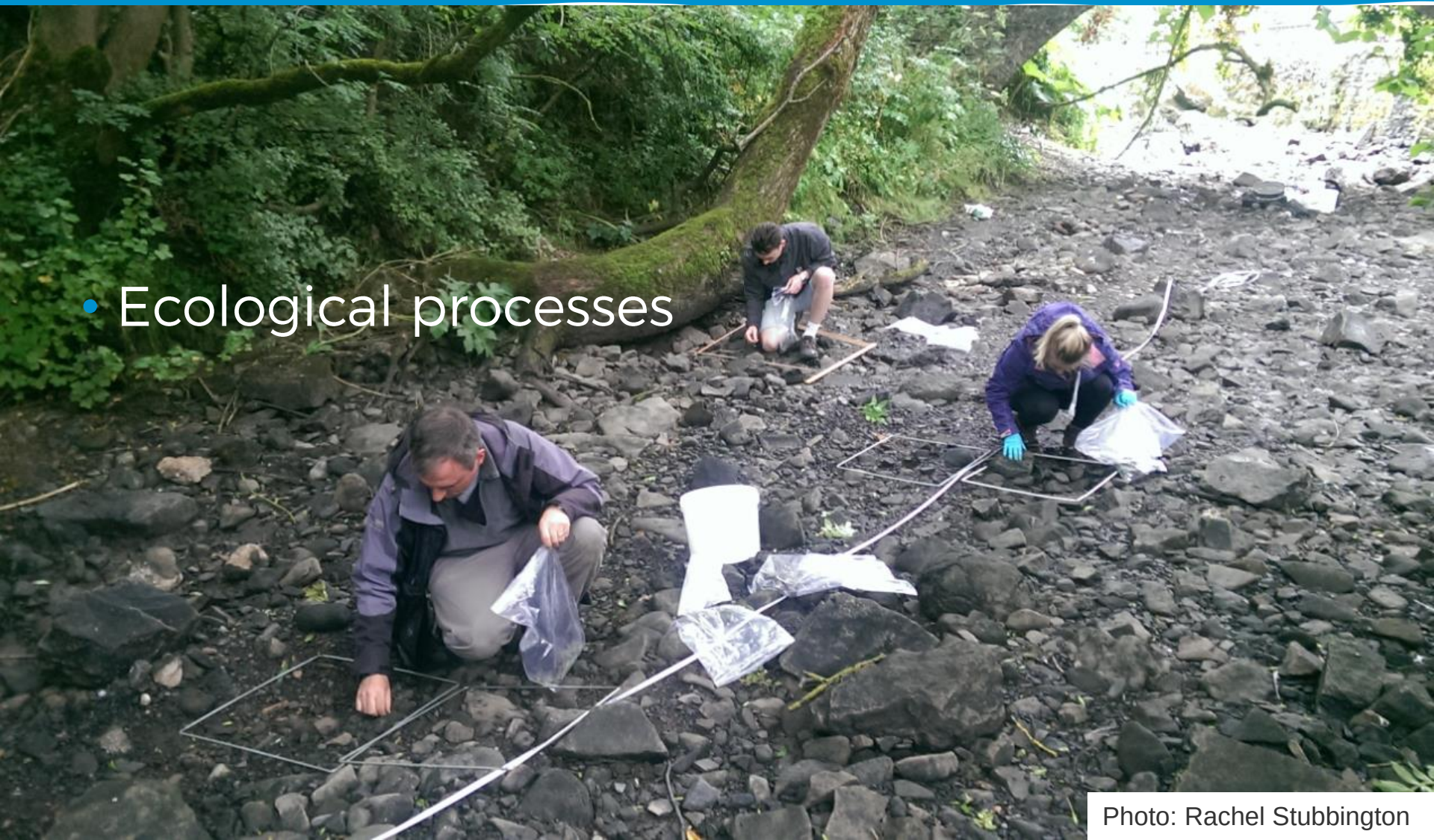


Photo: Rachel Stubbington

Background.
How valuable are t-rivers, to people?

- People value t-rivers during flowing-phases
- Dry phase assets / services are more subtle
- Dry channels symbolize human impacts

ChilternChalkStreams Retweeted

Five Rivers @FiveRiversEC · 13 Nov 2017

What a difference a year makes! #RiverBulbourne before during and after our #restoration works @BoxMoorTrust

ChilternChalkStreams Retweeted

Ver Valley Society @VerValleySoc · 3 Dec 2017

There used to be a river here. A precious #chalkstream too. Not looking good for a happy New Year #RiverVer.

Towards t-river natural capital metrics

To value t-river assets **across wet & dry phases**, we will:

1. identify and evaluate data sources
2. characterise natural assets: extent, distribution and condition
3. propose, evaluate, and rank metrics

ULTIMATE GOAL

Ecologically sensitive t-river **policies** and **management** strategies that the **public support**

Methods.

Team meeting 1: project planning

11 team members; 7 attending, representing

- Research organisations: Centre for Ecology & Hydrology; Catalan Institute for Water Research
- Water industry: Wessex Water
- Regulatory bodies: Environment Agency, Natural England
- Charities: Buglife, Freshwater Biological Association
- Universities: Loughborough, Nottingham Trent

+ remote involvement

Discussion to refine proposal

Methods.
Task 1. **Identify and evaluate data sources**

1. Define abiotic, biotic, combined assets
    - Geodiversity; freshwater
    - Biodiversity – genes, taxa, functions
    - Ecosystems
2. Compile information characterising assets
    - Published papers and reports
    - Unpublished data sets
3. Define inclusion criteria; rank the include-able.

Allocated time
5 days

Methods

Task 2. Characterise natural assets

4. Review evidence to characterise:
   - **Extent**: how much is there?
   - **Distribution** in space / time
   - **Condition**: is it in good nick?

   Compare with other ecosystems. Identify:
   - **unique** assets
   - **enhanced** assets

   Link assets to **processes**...

Credit: Adrian Chalkley @box_valley

Allocated time

5 days

Methods
Task 3: Identify, evaluate, and rank metrics

5. Task informed by:
   - Ecological metrics e.g. *richness* and *diversity*
   - Indices used in other ecosystems e.g. *Community Conservation Index*[1] in rivers
   - Existing natural capital metrics

   Evaluate, considering
   - Temporal / spatial flexibility
   - Responsiveness, uniqueness
   - Data availability

[1]Chadd & Extence (2004)

Allocated time
2 days

Methods
Task 4: Prepare report

Two team meetings:

- To plan report
- To evaluate advanced draft

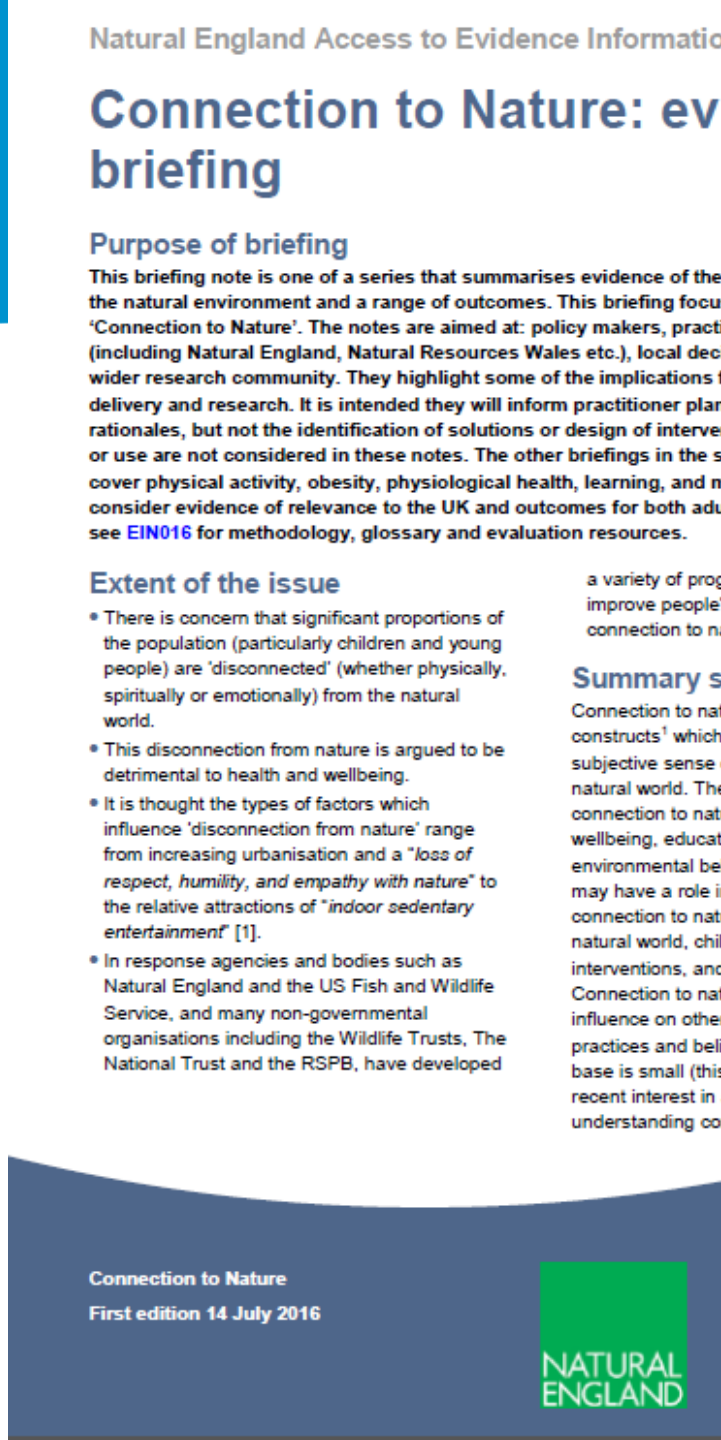
Report format

- Like a Natural England *Access to Evidence Note*
- Photos, summary figures etc.

+ information database

Allocated time

4 days


Natural England Access to Evidence Informatio

Connection to Nature: ev
briefing

Purpose of briefing

This briefing note is one of a series that summarises evidence of the
the natural environment and a range of outcomes. This briefing focu
'Connection to Nature'. The notes are aimed at: policy makers, practi
(including Natural England, Natural Resources Wales etc.), local dec
wider research community. They highlight some of the implications
delivery and research. It is intended they will inform practitioner plan
rationales, but not the identification of solutions or design of interve
or use are not considered in these notes. The other briefings in the s
cover physical activity, obesity, physiological health, learning, and n
consider evidence of relevance to the UK and outcomes for both adu
see EIN016 for methodology, glossary and evaluation resources.

Extent of the issue

- There is concern that significant proportions of the population (particularly children and young people) are 'disconnected' (whether physically, spiritually or emotionally) from the natural world.
- This disconnection from nature is argued to be detrimental to health and wellbeing.
- It is thought the types of factors which influence 'disconnection from nature' range from increasing urbanisation and a "*loss of respect, humility, and empathy with nature*" to the relative attractions of "*indoor sedentary entertainment*" [1].
- In response agencies and bodies such as Natural England and the US Fish and Wildlife Service, and many non-governmental organisations including the Wildlife Trusts, The National Trust and the RSPB, have developed

a variety of prog
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Summary s

Connection to nat
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understanding co

Connection to Nature

First edition 14 July 2016

NATURAL ENGLAND

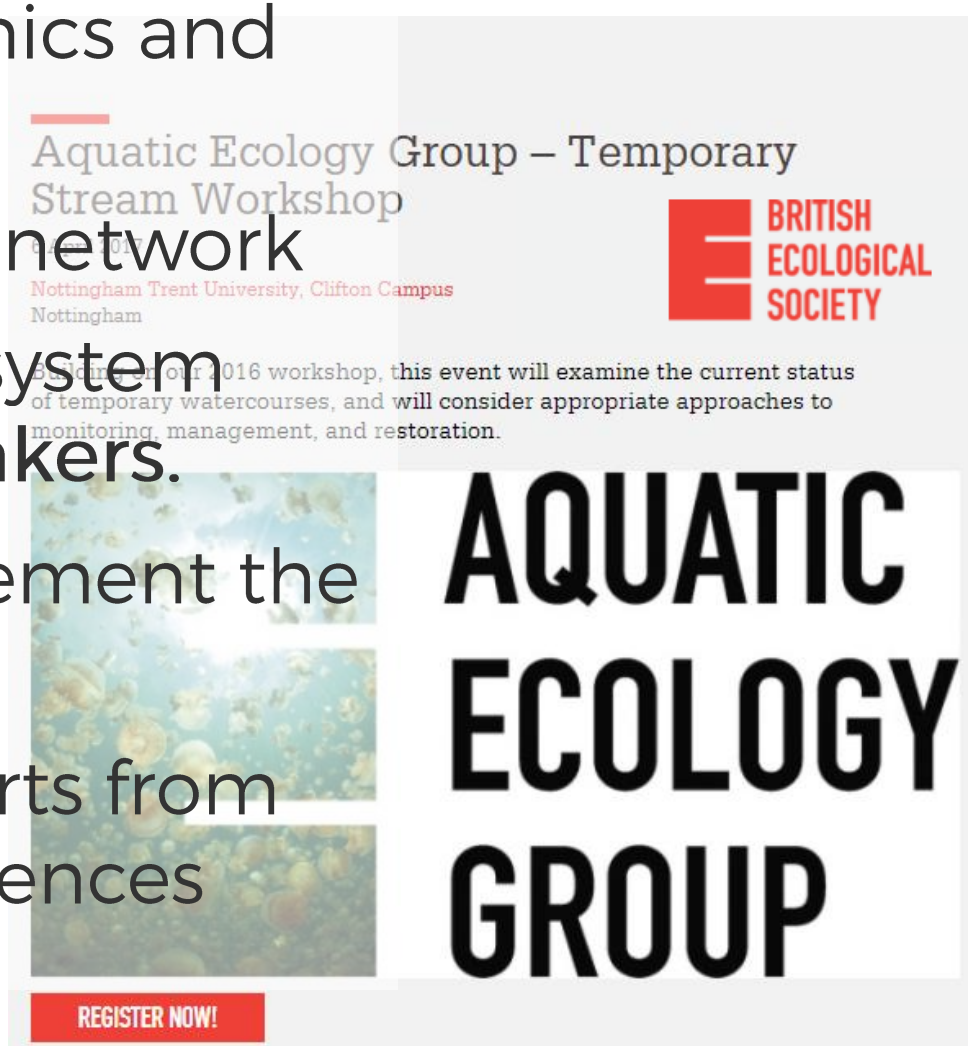
Engaging users.

During the project

Workshops bring academics and managers together

Team members expand network

- Water resource / ecosystem protection **policy makers**.
- **Managers** who implement the policies
- **Natural capital** experts from natural and social sciences



Engaging users.
Ensuring report and database **use**

Report / database[1] **launch event**

- Invited **funded** + **self-funded** people
  - **Team** members; their contacts
  - **Network** 'members'
  - **New** people e.g. twitter, JISC.
  - Need more **terrestrial** scientists

[1]The database: an online shared space, updated and updatable, an expanding resource repository

Natural capital of temporary rivers **team**

Leader

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Nottingham Trent University

Members

Mike **Acreman**

Adam **Bates**

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Chris **Mainstone**

Chris **Westwood**

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