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Nature Networks – a freshwater perspective

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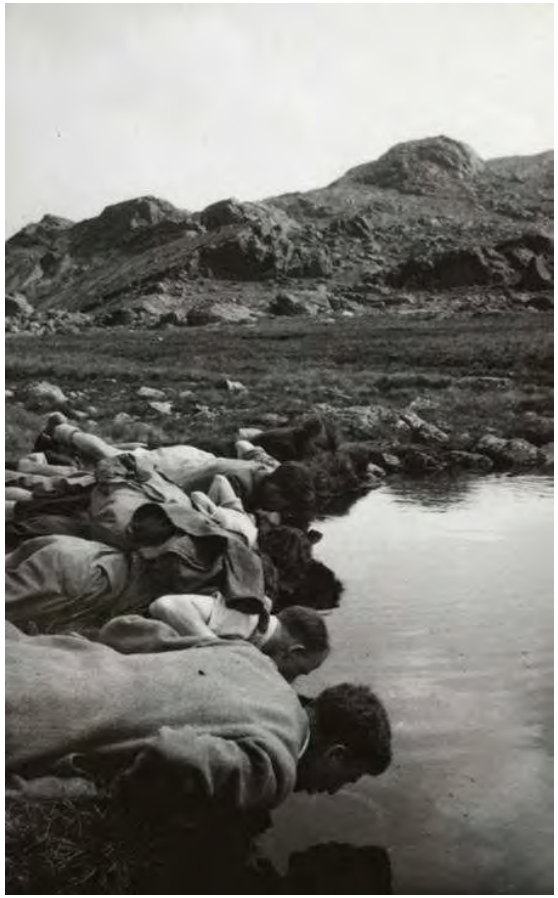
Who we are

We are an impartial **scientific authority** on **UK** and **international** nature conservation

Lake District & Freshwater Biological Association



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Nature based Solutions

Nature-based solutions are actions to **protect**, sustainably **manage** and **restore** natural and modified **ecosystems** in ways that address **societal challenges** effectively and adaptively, to provide both **human well-being and biodiversity benefits**.

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River Restoration

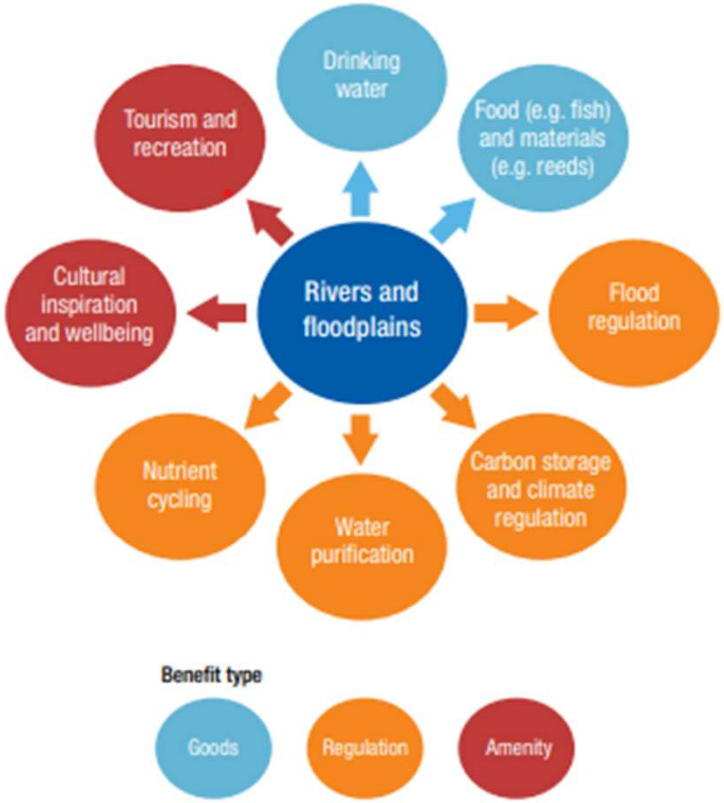
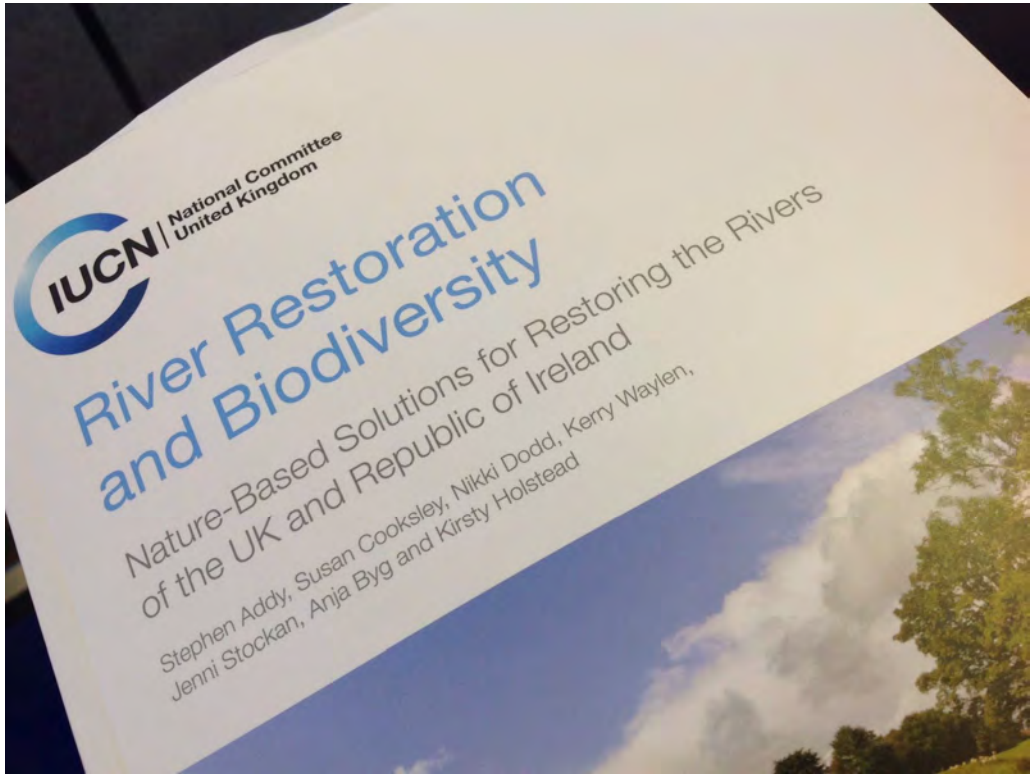


Figure 4.1 Benefits to society provided by rivers and floodplains. Poor management of our rivers could lead to over-exploitation of some of these benefits causing damage to the health of the river and the biodiversity it supports. Conservation and restoration strategies are needed to protect and reinstate the natural function of rivers to achieve this widespread range of benefits.



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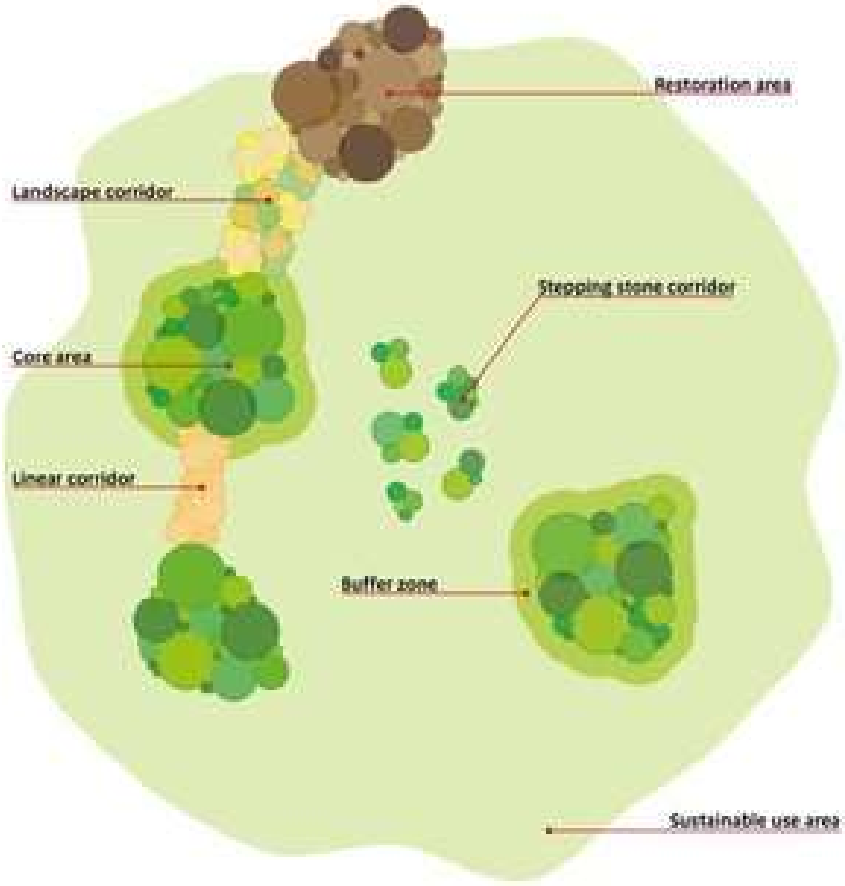
Lawton 2010



Natural England Image

Duigan, C., Ayling, S., Bassett, D., Crick, H.Q.P. & Weyl, R. 2020. **Terrestrial Nature Networks in the UK – A Review.** JNCC Report No. 659, JNCC, Peterborough, ISSN 0963-8091.

Find out more at BES Festival of Ecology – Conservation Science and Policy Session

Bigger, better, more joined up.

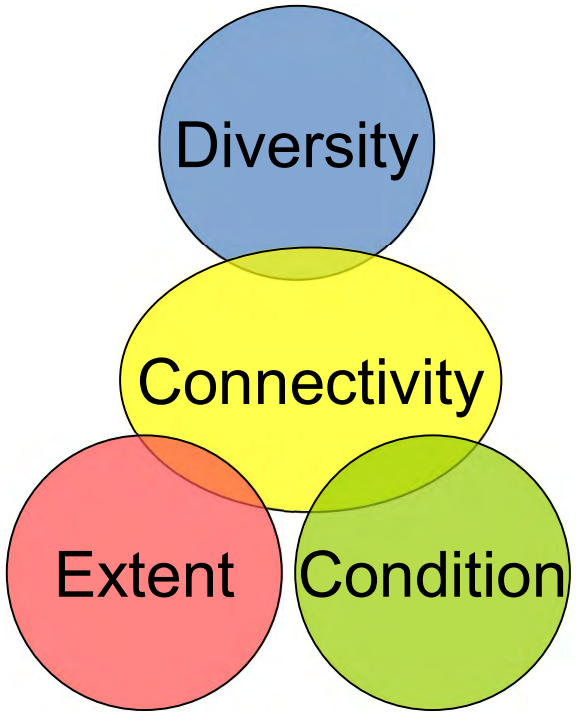
UK Network Policy Framework

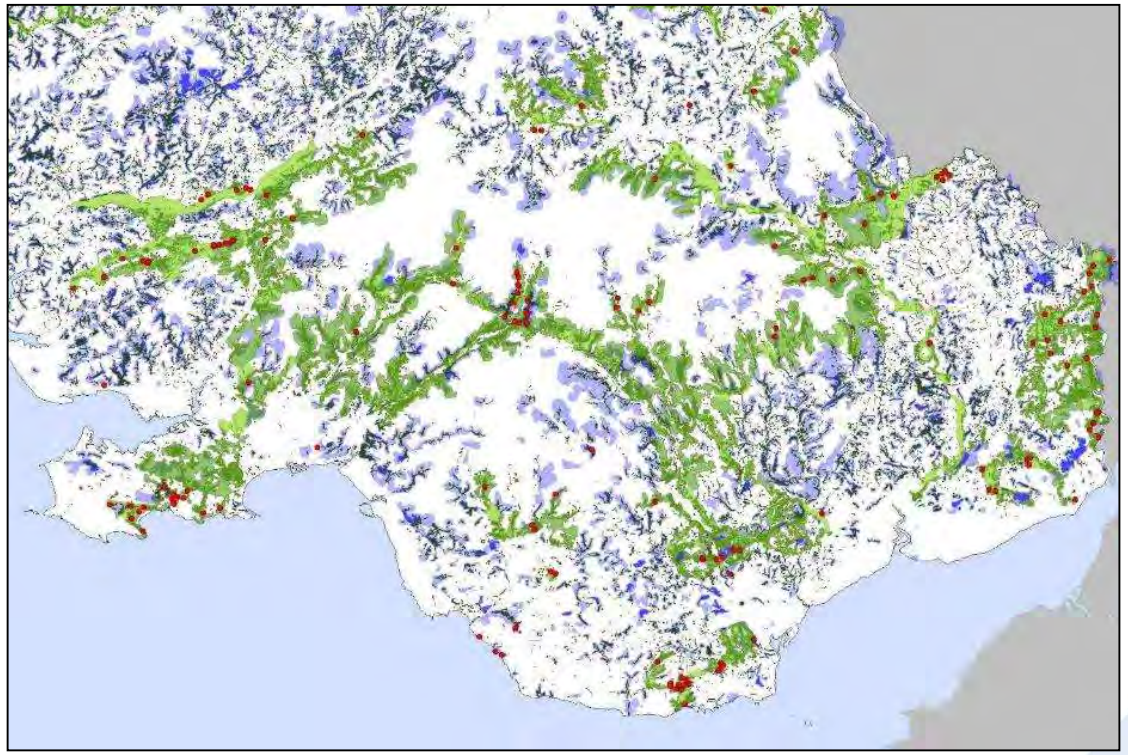
- Complex with focus on concepts of networks and resilience.
- **Key to future planning for nature and landscape conservation, ecosystems restoration and services.**
- Operational policy opportunities: agri-environment schemes, development planning, carbon storage and peatland restoration, and forestry strategy.

Polluted Pool at Maindee; Jack Crabtree (1938)
AC-NMW Collection

Wales – Resilient Ecological Networks

Welsh Government: "*Networks of habitat in good ecological condition joining up designated sites and other biodiversity hotspots to provide maximum benefit for biodiversity and our well-being.*"





Material provided by Dr. James Latham, Natural Resources Wales

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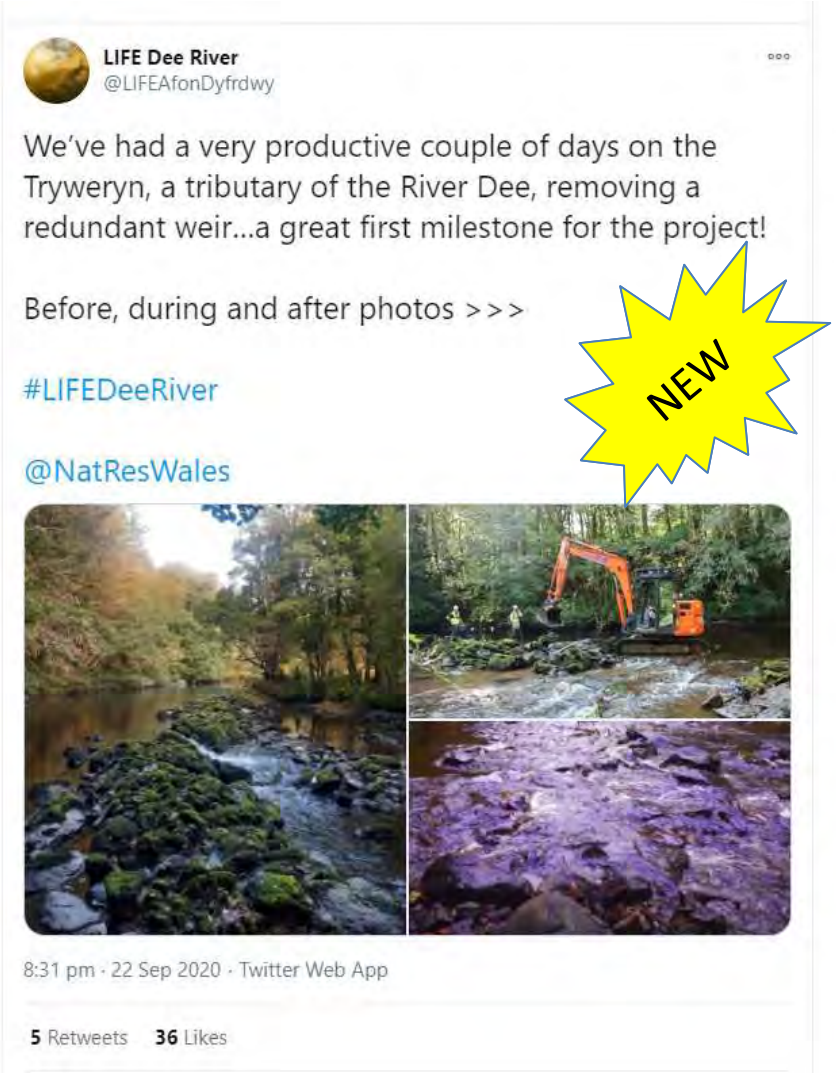
Diversity

Vegetation communities of British lakes: a revised classification; JNCC 2006

Vegetation communities of British rivers; a revised classification; JNCC 1999

Connectivity



Signal Crayfish, *Pacifastacus leniusculus* ©GBNNSS

Zebra Mussel, *Dreissena polymorpha* ©GBNNSS

Floating pennywort, *Hydrocotyle ranunculoides* *© SNPA*

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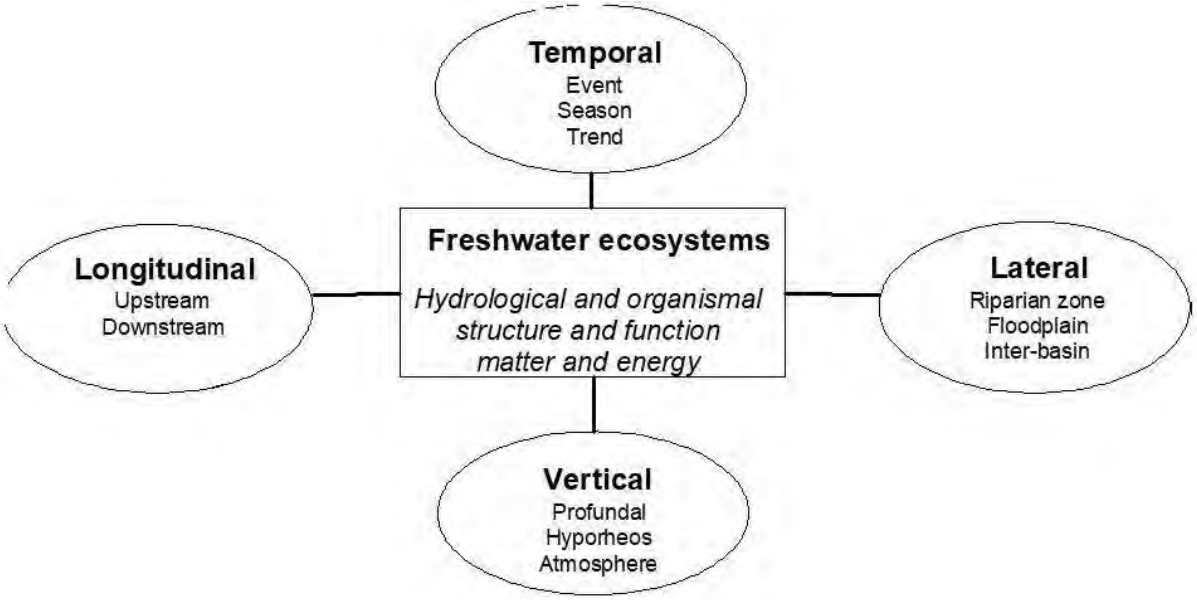
Connectivity



Ormerod SJ, Durance I, Hatton-Ellis TW, Cable J, Chadwick EA, Griffiths S, Jones TH, Larsen S, Merrix FL, Symondson WOC, Thomas RJ and Vaughan IP. 2011. *Landscape Connectivity of Freshwater Ecosystems: Strategic Review and Recommendations*. CCW Contract Science Report No: 932, 117pp, CCW, Bangor.

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Extent

- Resilience increases with extent of a habitat or species.
- **Many species have a minimum size of habitat**
- There is also an **influence of size on ecological processes and ecosystem services**
- For fresh waters connectivity and extent need to be considered together.

Condition

- Management (site vs catchment)
- Pressures
- Inputs and abstractions
- Stressed conditions have reduced capacity resist, recover, adapt
- For fresh water, tipping points need to be considered.

Shocking state of English rivers revealed as all of them fail pollution tests

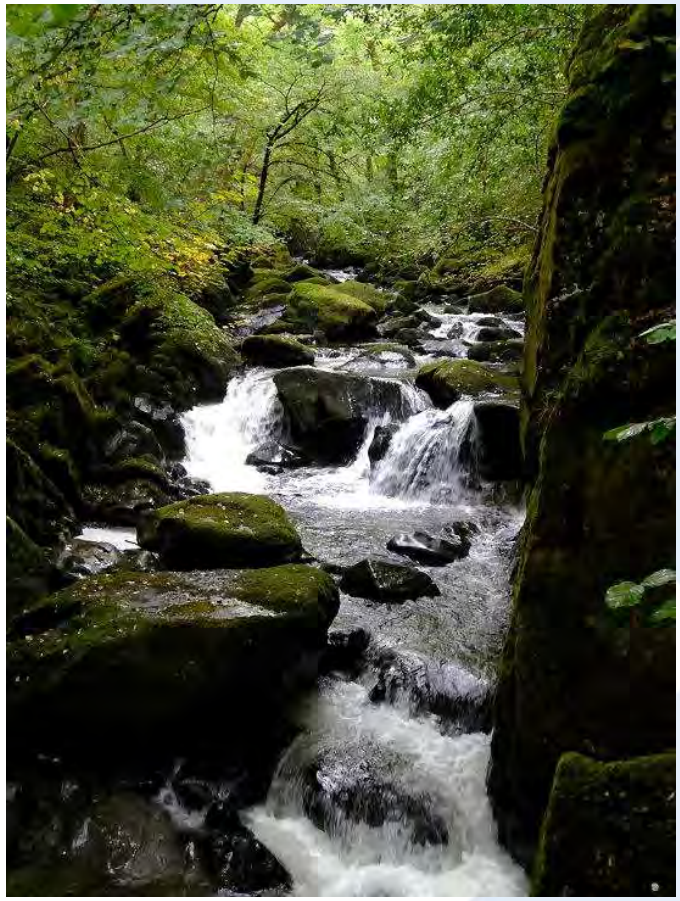
Data reveals just 14% of good ecological standard and none of good chemical standard

▲ Data reveals just 14% of English rivers are of 'good' ecological standard. Photograph: David Levene/The Guardian

All English rivers have failed to meet quality tests for pollution amid concerns over the scale of sewage discharges and agricultural and industrial chemicals entering the water system.

Data published on Thursday reveals just 14% of English rivers are of good ecological standard, a rating that suggests they are as close to their natural state as possible.

theguardian



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Research

Overarching Research Priority: Concepts of nature networks and increasing ecological resilience

Natural England Image

- High dependence on available land use data with expectation that EO will be common standard in future - Will this work for fresh water?
- Are the network modelling programs and mapping tools to produce a variety of spatial products at different scales applicable?
- Need to focus on developing and defining indicators of resilience and connectivity, which include fresh waters.

A lack of evidence should not necessary delay action

Adaptive management

NRN Toolkit for England

- Toolkit = Set of standard data available to all networks
  - Priority River Restoration Map for England
  - Priority lakes
  - Priority chalk rivers
  - Available through FBA Citizen Science Portal

https://www.indy100.com/article/the-beautiful-map-of-europe-drawn-by-its-rivers-and-streams--ZyzcQXdTdQW

Information provided by
Chris Mainstone,
Natural England

Catchment Based Approach

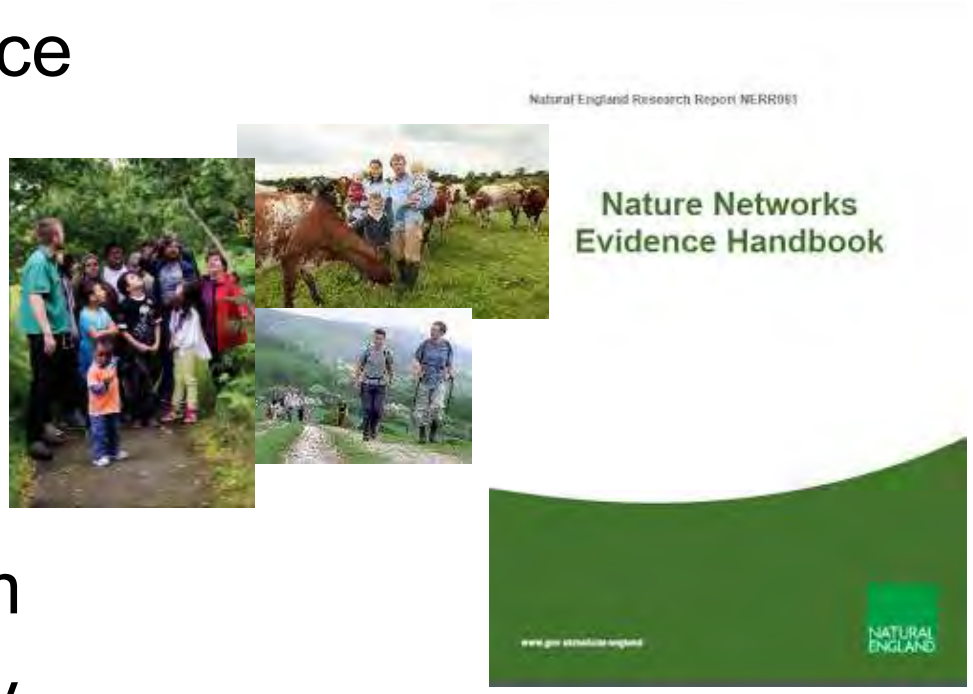
NATURAL ENGLAND

fba Freshwater Biological Association

Network Approaches

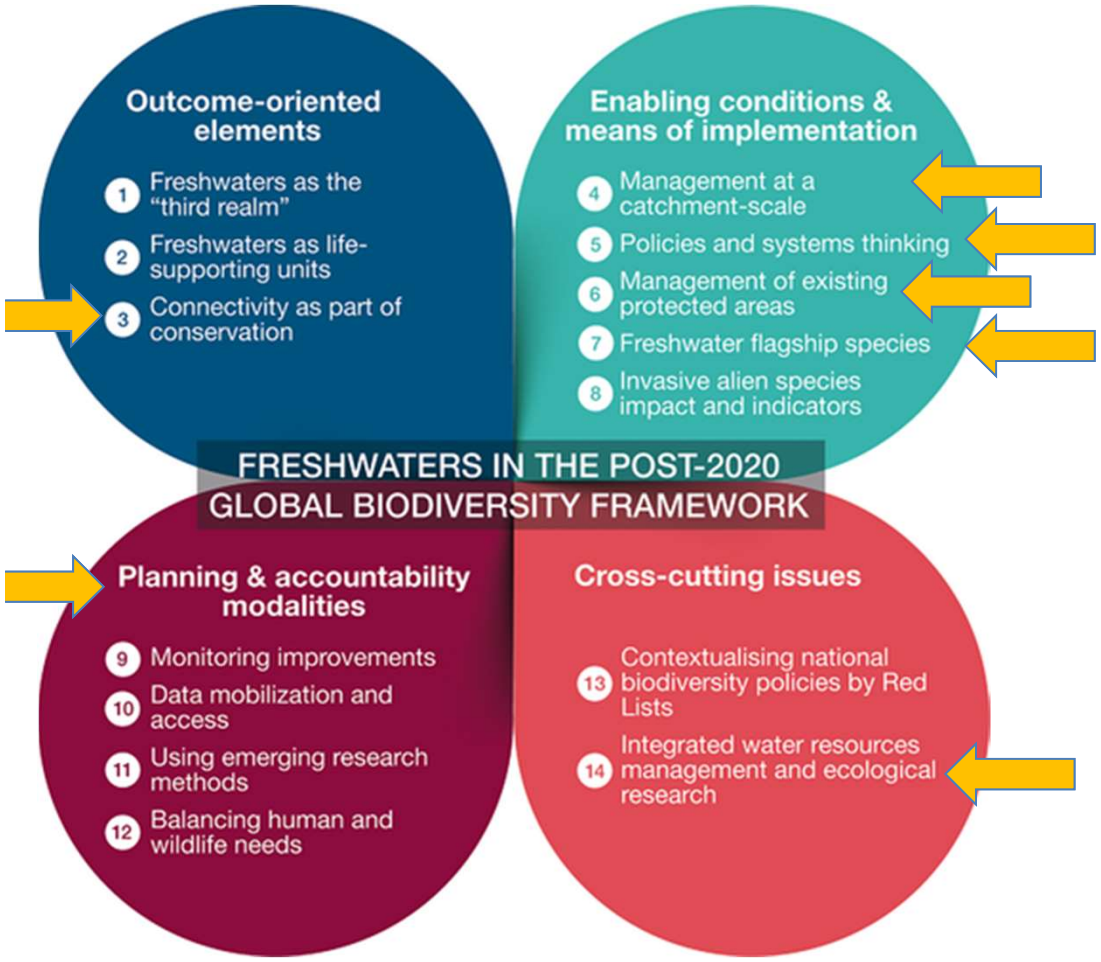
Nature networks are about people as much as nature

- Understand the place
- Create a vision
- Involve people
- Create core sites
- Build resilience
- Embrace dynamism
- Encourage diversity
- Think ‘networks’: rather than individual sites
- Start now but plan long-term
- Monitor progress



Natural England Image

Global Biodiversity Framework



Van Rees…Thackeray… 2020. **Safeguarding freshwater life beyond 2020: Recommendations for the new global biodiversity framework from the European experience.** *Conservation Letters*

"Act locally, contribute globally"

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