

Freshwater Habitats Trust

The Freshwater Network
Dr Naomi Ewald



A bit of history ...

Started in 1988 as Pond Action (Jeremy Biggs, Roger Sweeting, Anne Powell) and funded by WWF to ‘create a freshwater conservation organisation’

What we do: protect freshwater biodiversity,

How: use research to underpin policy and practice,

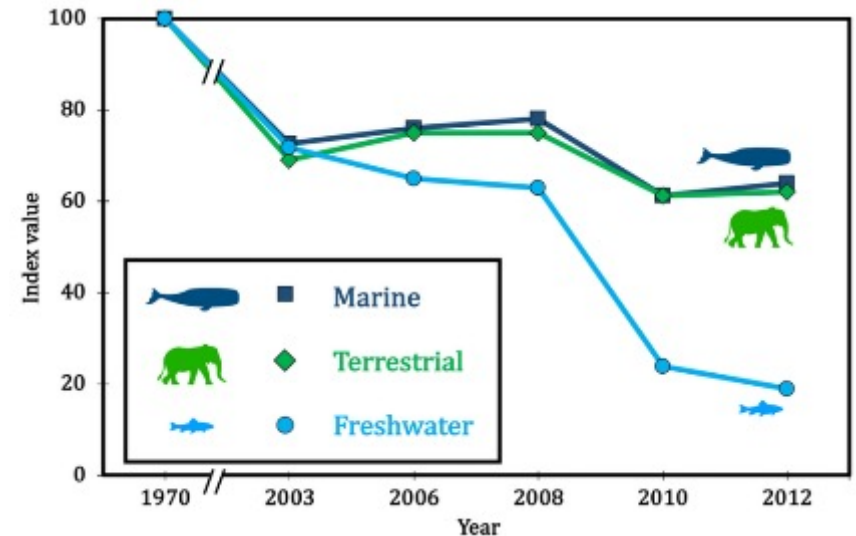
Special focus on:

- Small waters, especially ponds – because of the evidence of their importance for freshwater biodiversity
- Evidence-based solutions – freshwater biodiversity recovering as a result of our practical interventions
- What next ...

FRESHWATER BIODIVERSITY IN CRISIS

Global declines in freshwater species are 4- 6 times greater than those for terrestrial and marine ecosystems¹.

Most freshwaters are in poor condition. In 2022, only 16% of monitored surface waters achieved the modest 'Good' ecological status of the WFD².



Small waters and wetlands (which comprise the vast majority of waterbodies but are not routinely monitored) are also declining.

1. Collen, et al. (2014) Global patterns of freshwater species diversity, threat and endemism. *Global Ecology and Biogeography*. 23 (1): 40–51.

2. Technically, no WFD water bodies in England now achieve Good status because of recent changes (autumn 2020) to the way persistent chemicals are described. However, the limited number of sites and samples on which this information is based will probably lead to the assessment that no sites are achieving good status to be revised upwards when better information is available.

The big issue ... which remains

- Huge difference between clean, unpolluted, freshwaters and the state and abundance of degraded freshwater habitats
- Things are *still* getting worse:
 - freshwater species are declining and going extinct
 - protected sites shows statistically significant declines
 - plant abundance: 17% loss (30% for submerged species)
 - loss of rare species: 55% of sites
 - landscape scale wider countryside declines in freshwater plants
 - mean species loss of 1% pa
 - rare species loss of 2% pa



One example (of many) : a pollution sensitive species extinct in England on our watch the Glutinous Snail.

The Freshwater Network

If we want to reverse the declines in Freshwater Biodiversity in the UK we need a different approach. A **new national freshwater network, comprised of healthy unpolluted interconnected freshwater landscapes.**

- **Protect the best:** Strengthen within and build out from existing freshwater biodiversity hotspots at both national and local levels.
- **Use smaller waters and wetlands as ecological engineers:** About 80% of the freshwater environment is made up of smaller waters. They have the power to regenerate freshwater landscapes.
- **Treat freshwaters as a network of habitats:** The majority of freshwater species (c.2/3rds) use multiple waterbody types across the landscape. This approach is essential for effective biodiversity conservation.
- **Bring back clean water:** Clean water is vital for biodiversity. It is now a very scarce habitat, and restoring it to the landscape is a critical step for freshwater protection.

Some key background concepts

- Freshwater organisms exist in networks of waterbody types, not just rivers *or* ponds *or* lakes *or* wetlands.

There is clear evidence that the majority of freshwater species (c.2/3rds) use multiple waterbody types, with populations existing in this network of habitats across the landscape.

- Water plants living on pond margins are also found on river margins; common toads breed in lakes and ponds and slow-flowing river backwaters; mayflies of fast flowing water also live on well-oxygenated wave-washed lake shores. For the majority of freshwater plants and animals waterbodies don't need to be physically connected to provide a network of habitats.

Managing these networks of habitats is vital for effective biodiversity conservation.

- At present 'landscape scale' description and practical management of freshwater biodiversity is invariably based on one, sometime two, types of habitat e.g. river or lakes. Rarely is whole landscape freshwater diversity described (ponds, lakes, streams, ditches, rivers, wetlands), yet this is the true measure of where freshwater organisms occur and whether they are thriving.

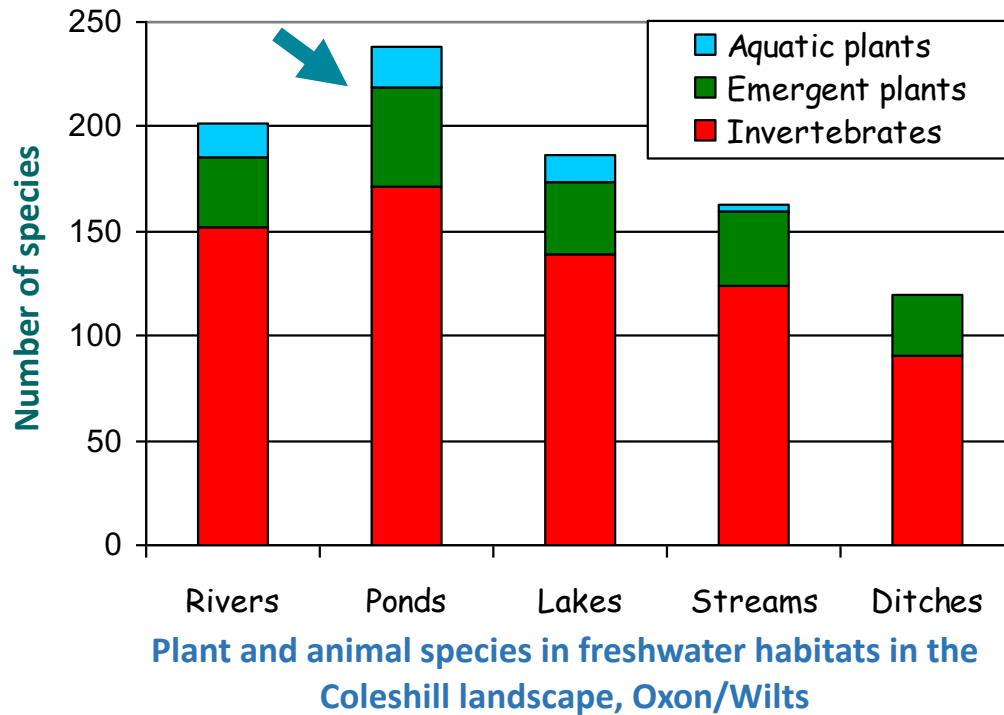
The original Coleshill dataset ...

One of first assessments to compare different waterbody types, and showed importance of ponds

At landscape level, ponds were richest habitat, a result echoed across Europe, and beyond



The Coleshill landscape study area described in Williams P, Whitfield M, Biggs J, Bray S, Fox G, Nicolet P, and Sear D, 2004. Comparative biodiversity of rivers, streams, ditches and ponds in an agricultural landscape in Southern England. *Biological Conservation* 115: 329–341.





Some key background concepts

- **Protecting the best is vital for freshwater recovery.**

Small freshwaters are vulnerable to the same stressors as larger freshwaters

- **Water quality**
- **Loss of grazing**
- **Recreation/proximity to the urban environment**

Freshwater habitats located on the edge of high quality or fragmented landscapes are showing greater rates of loss than those buffered within larger areas of semi-natural habitats.

However, creation or management of small freshwaters within or adjacent to high quality freshwater landscapes can result in recovery rapidly (incl. for rare species).

Step 1. Identify important freshwaters nationally and locally

Identifying the important areas for freshwater biodiversity

Methodology approved by national panel of academics, practitioners and freshwater species/habitats specialists.

Essentially two kinds of biological information:

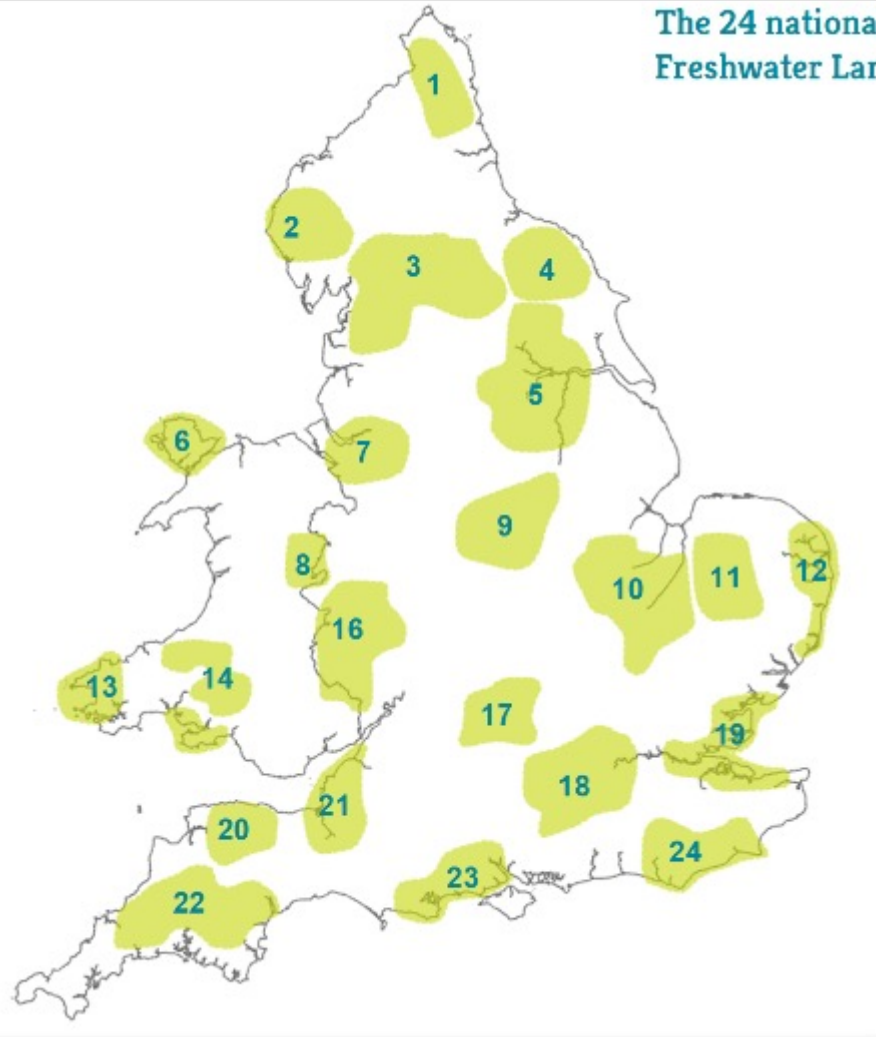
- Habitat data
- Species data

But also a 3rd category (to cover data deficient areas):

- Surrogates of biodiversity: clean water and places with natural hydromorphology

Important Freshwater Landscapes

The 24 nationally significant Important Freshwater Landscapes are:



1. Northumbria
2. North Lake District
3. Yorkshire Dales and Forest of Bowland
4. North York Moors and surroundings
5. Yorkshire Lowlands
6. Anglesey
7. North-west England
8. Montgomery Canal
9. East Midlands
10. Cambridgeshire Fens
11. The Brecks and surroundings
12. Norfolk and Suffolk Broads
13. Pembrokeshire heaths
14. South-west Wales rivers
15. Gower
16. Shropshire rivers
17. Oxford area
18. Thames Basin
19. Thames Estuary
20. Exmoor area
21. Avon and Somerset Levels
22. Dartmoor and West Cornwall
23. New Forest and Dorset Heaths
24. South Coast and The Weald



Identifying local Important Freshwater Areas

- Indicates important areas for both freshwater species and habitats
- Helps to identify areas that need protection (noting that core areas in this catchment are losing special species)
- Basis of planning projects to build out from these core areas by restoring natural processes (clean water, natural hydrology, high biodiversity)

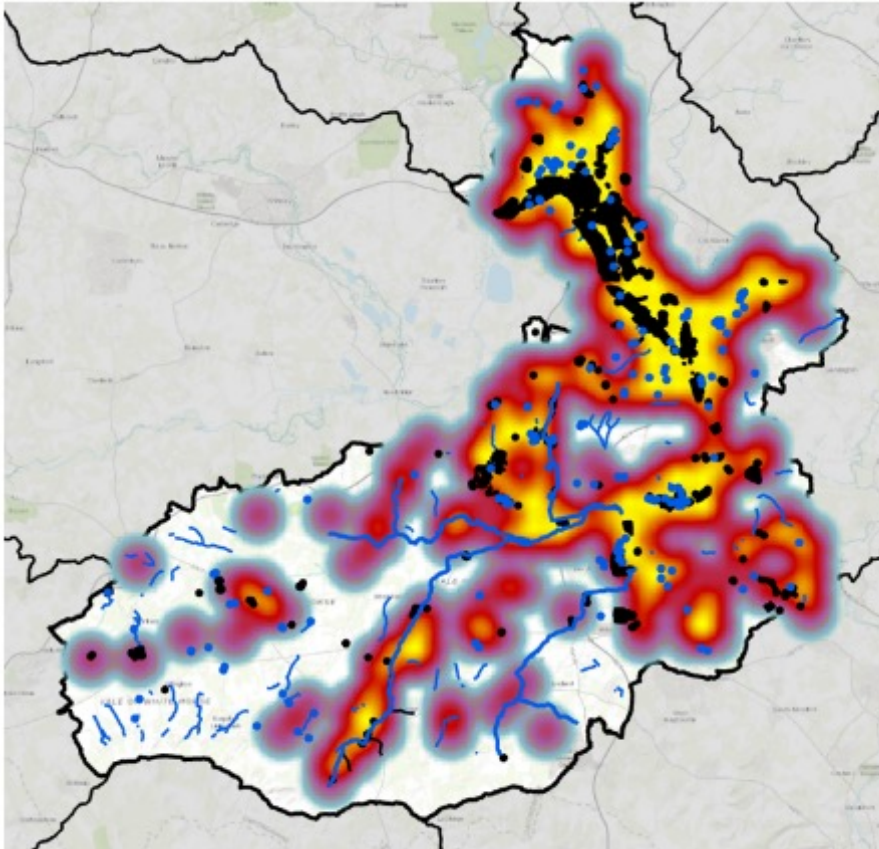


Figure 20 Heat map of the density of species per 1 km square in the Ock catchment, overlaid by priority habitats in black and in blue WFD High status rivers for invertebrates and phosphate and clean water sites.

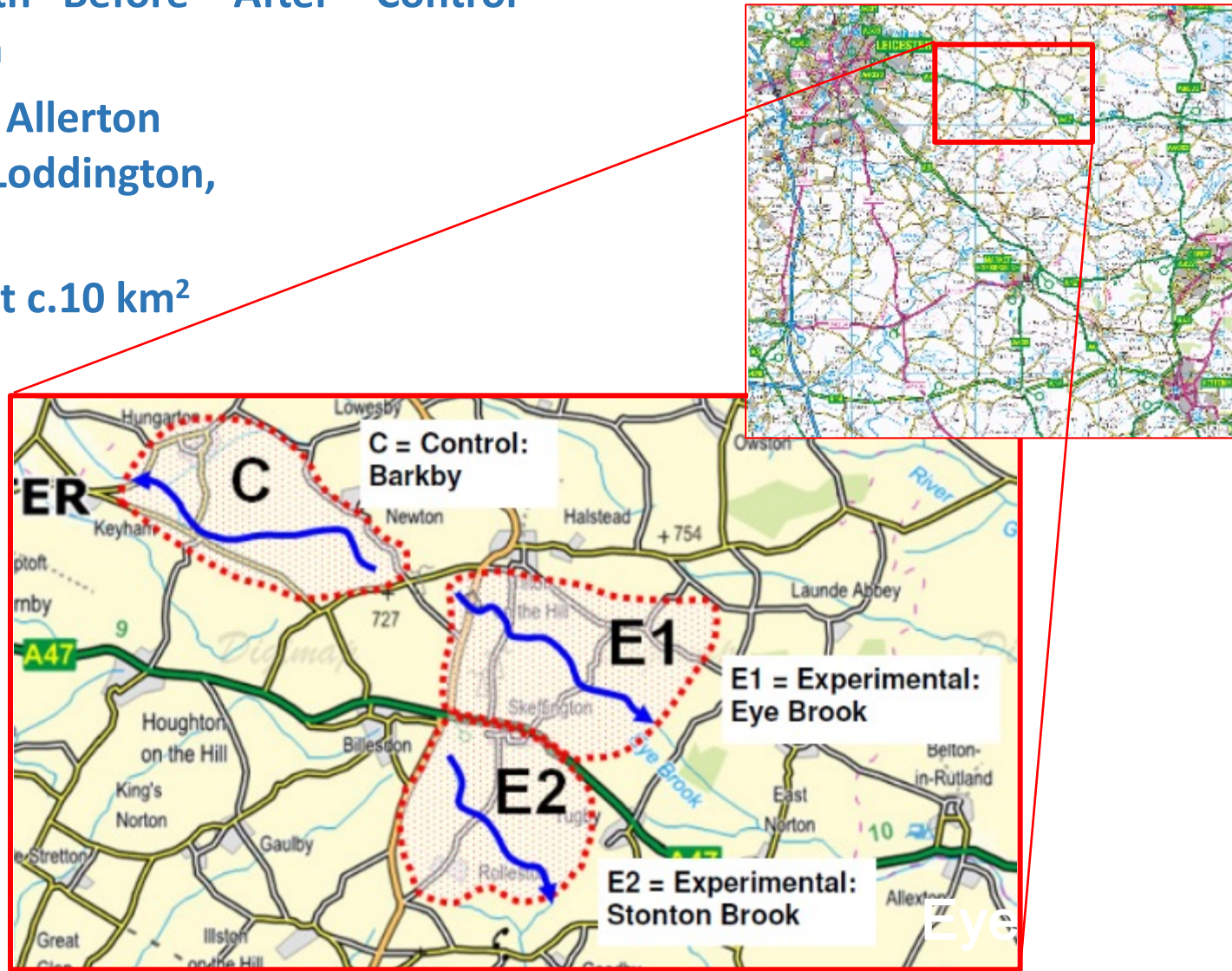
Some key background concepts

- Small freshwater habitats are at least as important for freshwater biodiversity as larger habitats, often more so.
- Problems for large waterbodies are difficult to solve and require agency led solutions. We don't know whether we can recover freshwater biodiversity in these habitats and *if* we can how long that will take.
- Evidence increasingly shows that freshwater biodiversity recovery is more likely to be achieved when focused on small freshwaters at landscape scale.
- Small habitat wins can be achieved by individual people or landowners – so many more people can contribute usefully to solutions.
- Small water bodies and wetlands are cheaper to create and manage than large waterbodies and evidence indicates rapid successful change is much more likely.

Step 2. Deliver project which result in landscape scale change

Water Friendly Farming

- Experiment with “Before – After – Control – Impact” design
- Close to GWCT Allerton Project site at Loddington, Leicestershire
- Each catchment c.10 km²



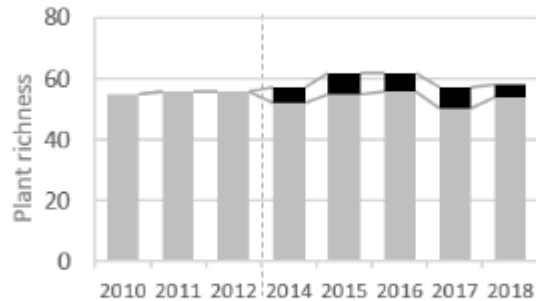
Effect of adding measures

Five years after ecosystem-services measures were added (bunded ditches, on-line ponds, interception ponds), these features increased the total number of plant species in their catchments by 9.5%.

This cancelled-out the background loss of richness but, importantly, did not restore the loss of rare plants.

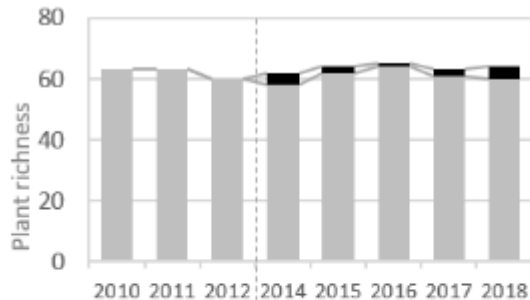
Effect of adding features.....

Eye: ecosystem services measures



- 9.5% gain in landscape wetland plant richness
- Mitigated loss (but not of rarities)

Stonton: ecosystem services



Addition of ecosystem services measures

■ Plant species in all waterbodies (streams, ditches, ponds)

■ Plant species added by the new measures ponds

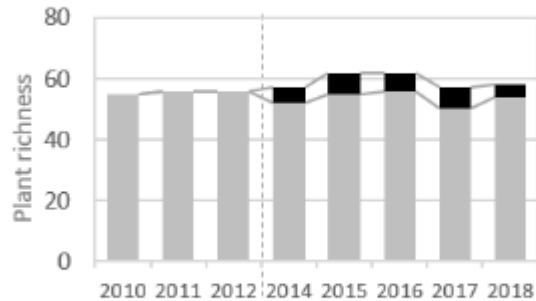
Benefits of clean water ponds

The addition of clean-water ponds as a biodiversity-only measure brought substantial catchment benefits:

- Increased number of wetland plant species by 27%, and the number of rare plant species by 190%. Populations of spatially-restricted species also increased and other resilience measures improved.

Effect of adding clean ponds.....

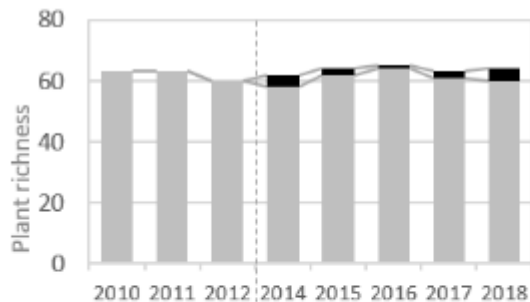
Eye: ecosystem services measures



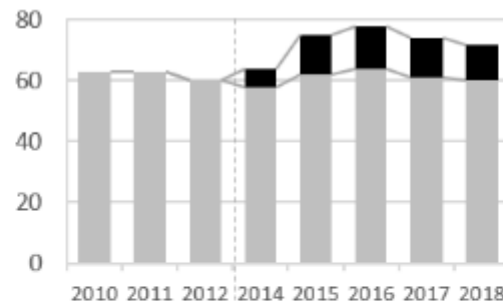
- 27% gain in landscape wetland plant richness
- First such evidence



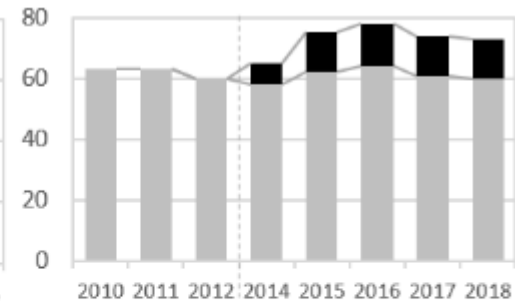
Stonton: ecosystem services and biodiversity measures



Addition of ecosystem services measures



Addition of clean water ponds



Addition of all nature based measures

■ Plant species in all waterbodies (streams, ditches, ponds)

■ Plant species added by the new measures ponds

New ponds have brought back uncommon plants to the catchment



Marsh Arrowgrass



Bristle Clubrush

e.g. Red Data Book Marsh Arrowgrass (probably came up from seed bank), bristle clubrush, mixed beds of stoneworts, pondweeds and water-buttercups

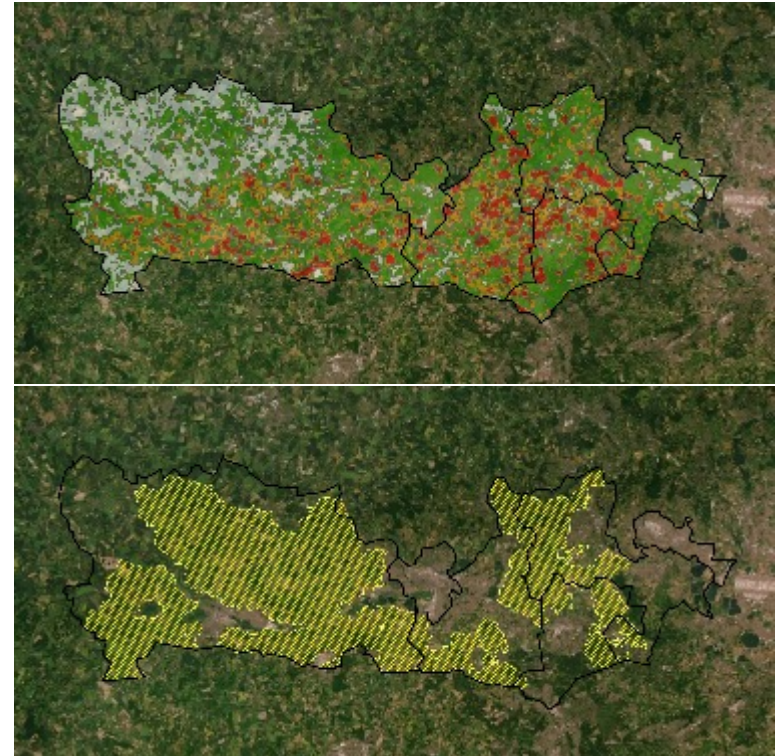
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Great crested newt District Licencing scheme: habitat creation and management

Focus on landscape scale

- Working in proximity to known Great Crested Newt populations - **Strategic Opportunity Areas**
- Improving connectivity by adding stepping stones and connectivity features
- Increasing numbers of high quality ponds
- Increasing extent of suitable terrestrial habitat



Great crested newt District Licencing scheme: habitat creation and management

Scheme progress

- Largest ever national pond creation scheme (c.3,500 ponds created or managed)
- Scheme running for 5 years (2018 – 2023)
- Working on only 6% of Great Crested Newt range
- Assessment shows that it has already had a significant positive net gain on the Favourable Conservation Status of Great Crested Newts



Great crested newt District Licencing scheme: habitat creation and management



Impact on non-target species

PSYM 'good' score: 2022=79%, 2023=83%

New ponds = new populations of rare and common but declining plant species

- Lesser Water-plantain (VU) and Common Bladderwort (LC but rare in Beds)
- Red Pondweed (VU) near Yardley Chase SSSI
- Lesser Marshwort (VU)
- Translucent Stonewort (new pop. for Glos) and Blunt-leaved Pondweed (Glos rare)
- Other *regionally* rare species from Shabbington Wood SSSI (with some new county records): Water Purslane, Common Yellow-sedge, Long-staked Yellow-sedge



Freshwater Network – Next steps for the New Forest Catchment Partnership

- Undertake a local Important Freshwater Area assessment for the New Forest which goes beyond land ownership and geo-political boundaries.
- **Deliver projects with stakeholders that recognise, protect and repair the most biologically important freshwater and wetland hotspots.**
- Build out from, and link, these areas with new networks of clean water habitats, either by making new habitats, or by restoring existing damaged habitats.
- **Increase the quality of the wider landscape for freshwater species by increasing the extent of clean water and naturally functioning freshwater habitats. Recognising that current funding models still fall short of what's needed for freshwaters.**
- Help people get the most from clean unpolluted freshwater: guarding against floods, trapping carbon, and providing people with places to engage positively with freshwater wildlife.
- **Integrate monitoring across the wider New Forest which informs SMART targets and answers the question “are we delivering for freshwater wildlife”?**