Freshwater Habitats Trust submission to the Independent Water Commission

The Independent Water Commission's call for evidence recognises the value of small waters, and acknowledges the risks posed to achieving EA21 targets if there is continued neglect of small waters in statutory monitoring and management (see especially para. 169).

Our submission here is chiefly concerned with responding to this point, and setting out the importance of, and potential pathways to, greater integration of small waters into water environment policy, including through future development of WFD Regulations. Integration of small waters would have substantial benefits for the water environment, encouraging cost-effective and rapidly achievable benefits, in contrast to existing management approaches.

We are happy to engage with the Commission on any of the points raised here, and provide further information as necessary. We will also submit a broader response to the Commission's questions via the Consultation Portal.

Background

Freshwater Habitats Trust is particularly well positioned to inform the development of monitoring and management systems which best reflect current the modern understanding of the water environment.

We are a science-led charity that protects and restores freshwater biodiversity through our research and evidence-based conservation. In the early 2000s, we published the first cross-landscape comparisons of the biodiversity value of freshwater biodiversity in different waterbody types. These revealed, to much surprise, that ponds and other small waters are the principal reservoirs of freshwater biodiversity.[1] This pioneering finding has since been validated by studies across the UK and internationally.[2–4]

The understanding that small waters form a core element of the network of freshwater habitats that make up the water environment is now widely accepted amongst freshwater scientists.[5–8] Indeed, as noted in the Call for Evidence, the Environment Agency and Natural England are beginning to acknowledge this, developing programmes of monitoring headwaters and ponds. However, the regulatory framework for freshwater management largely predates this increased understanding, and perpetuates a scientifically out-of-date view of the water environment. It continues to prioritise large rivers and major lakes, largely overlooking the smaller streams, ponds, ditches, small wetlands and headwaters that constitute the bulk of the freshwater environment, mediate virtually all of the ecosystem services it delivers, and support the majority of its biodiversity.

Our call for recognition of small waterbodies has been echoed by the Office for Environmental Protection (OEP). In their most recent review of government's progress on the Environmental Improvement Plan they note that '…trends in small waters, which make up a significant proportion of the water environment, are poorly understood.'

Over the past 35 years, Freshwater Habitats Trust has worked in partnership with public agencies, academic institutions, the water industry and environmental NGOs to address this systemic gap. This has involved the development of national survey and monitoring programmes, including the 1989 National Pond Survey, the development of the PSYM system (the UKs standard approach to assessing the quality of ponds and small lakes since 2000), the 2007 Countryside Survey and, most recently, the PondNet programme.[9] Although the PSYM system, in particular, was originally designed to support the UK's WFD monitoring programme, its final use was prevented by the UK's adoption of the System A typology (see Q18 below) in implementing WFD. System A excludes all standing waters below 50 ha in size (most lakes, all ponds), of which there are c. 237,000 in England and Wales.

In addition to its research and monitoring work, Freshwater Habitats Trust undertakes extensive practical conservation activity, focusing on the creation and restoration of freshwater habitats, as well as floodplain and river restoration projects. Critically, through this work, the organisation has demonstrated the significant potential of well-designed pond creation programmes to restore freshwater biodiversity at a landscape scale, described further below.

Based on a now robust evidence base, the Trust advocates strongly for increased action on small waters, in order to make rapid, urgently needed progress to protect freshwater biodiversity and support national environmental targets.

Q17. Do you believe changes are needed to the WFD Regulations, including for 2027 onwards? If so, which areas would benefit the most from change?

☒ *River Basin Management Plans (e.g. spatial coverage, scope, the length of the planning cycle, the programmes of measures)*

☒ *The monitoring system (e.g. the evidence base, the use of technology, data sharing for monitoring, reporting)*

Q18. If you feel the WFD Regulations would benefit from change, please expand on where you feel changes are necessary and the reasons why.

Freshwater Habitats Trust supports targeted reform of the WFD that retains its core strengths - particularly its outcomes-based biological monitoring - while expanding its scope to reflect contemporary scientific understanding of freshwater ecosystems.

<u>Incorporating small waters</u>

There is a particular need to address the persistent omission of **small waters** - particularly ponds, small streams and high quality ditch systems - from current monitoring and regulatory frameworks, including River Basin Management Plans.

- Scientific advances over the past two decades have established that small waters are primary reservoirs of freshwater biodiversity.[1,3,8,10]
- The Water Framework Directive still focuses on large rivers and lakes, largely because WFD was developed before the importance of small waters was fully understood. As a result, most sources of freshwater biodiversity are currently left out of WFD-based monitoring and management.
- Incorporating small waterbodies into WFD can drive significant improvements in ecological outcomes across entire catchments, promoting landscape-scale recovery of freshwater ecosystems and fostering resilience to future pressures.
- There is already evidence, from initiatives such as Water Friendly Farming, demonstrating that creating high-quality waterbodies across landscapes can lead to substantial and sustained improvements in biodiversity.[11] This contrasts with results achieved by the current focus on larger waterbodies, where gains have been minimal over 30 years, and the potential for further progress remains limited.
- Although the WFD's stated objective is to **protect all waters,** the UK's adoption of the 'System A' typology has meant that monitoring and classification are largely restricted to larger rivers and lakes. It excludes the UK's c.500,000 ponds (up to 2 ha in area) and c.30,000 small lakes (up to 50 ha). In practice, it also excludes small streams with catchments of less than 10 km^2 - of which there are many thousands - which are lumped into the larger downstream sections of waterbodies. However, the WFD Regulations already contain provisions that can be used to incorporate small waters.

> Specifically, adopting **System B in Annex II** of the Regulations would allow for the setting of thresholds that bring smaller standing and running waters into scope. This would require no legislative change.

Importantly, these changes build on developments already underway within the Environment Agency to create monitoring standards for headwaters, and programmes for pond assessment being developed by Natural England. As noted above, WFD-compliant methods for ponds already exist.[9,12] A number of monitoring approaches are possible to include small waters within the existing framework, without placing undue demands on resources. One option is to monitor a stratified sample of small water body types within river basin catchments. Their condition can be assessed independently as groups of small waters, or nested within the condition assessment for existing (larger) WFD waterbodies. Alternatively, all small waterbodies could be assessed together within area-based survey units (e.g. stratified 1 km squares – 'monads'), as in Countryside Survey and PondNet. Both approaches would support catchment-scale assessments, and promote rapid, urgently needed ecological gains.

Recommendation. Post-2027, our recommendation is to apply WFD 'System B' to enable appropriate monitoring of smaller waterbodies and expand the scope of RBMPs to include these habitats.

Reforming the blanket Good Ecological Status target

Reform of Good Ecological Status (GES) targets is needed to address stagnating improvements in riverine biodiversity and increase the cost-effectiveness of the current WFD approach.

By setting a single objective for all waterbodies (to achieve GES by 2027) we have been, very expensively, aiming for mediocrity. This approach is particularly unhelpful for maintaining the condition of high-quality sites, which are effectively deprioritised, despite 'no deterioration' being a key aim of WFD.

Going forwards, applying a tiered target system will better protect high-quality sites, whilst continuing to promote the restoration of degraded waters.

The WFD's current focus on achieving good ecological status presents two problems:

A. For high-quality waterbodies, good status is too low a bar

Freshwater Habitats Trust's CEO (Professor Jeremy Biggs) was an expert assessor in early EU intercalibration reviews, and has examined the biological data behind WFD ecological status boundaries (i.e. high, good, moderate, poor, bad).

To attain GES, a waterbody's biological community should *'correspond to that expected under undisturbed conditions, but may show slight signs of anthropogenic impact'*.

In practice, the implementation of GES has been much more lenient than this definition suggests. Rivers with good ecological status can still be badly degraded, with many of the sensitive invertebrate groups lost. In practice a site can meet GES whilst having lost nearly half of its expected invertebrate species.[13]

The approach has disincentivised protection of our best rivers and streams, which are critical in maintaining regional biodiversity, as refuges for rare and sensitive species. Indeed, the current framework permits backsliding on individual quality elements (e.g. macroinvertebrates, phosphorus) from high to good status (para 10.11 of River Basin Planning Guidance), despite the WFD's 'no deterioration' principle.

To achieve meaningful biodiversity gains in streams and rivers, it is important that a proportion of ecological targets are set at high status, for waterbodies where this is attainable.

B. For badly degraded waterbodies, GES is too ambitious

For many degraded waterbodies, GES is too ambitious. Retaining GES targets risks wasted resources and continued stagnation of progress in restoring the water environment.

Recommendation: Post-2027, we recommend a more **adaptive target system** to help direct effort where it is most needed - both protecting and increasing the number of high-quality streams and rivers and enabling appropriate improvement in degraded ones.

Targets needs to remain outcome-based, and centred on biological data, tailored to both a site's current status and its potential for improvement. This would ensure that:

- High-quality sites are protected and restored
- Resources are allocated where meaningful improvements are achievable.

Q19. Do you believe changes are needed to improve how we monitor and report on the health of the water environment? If so, what changes do you believe could lead to improvements?

☒ *Expanding out from the water body level to report on a whole catchment*

The Call for Evidence doesn't provide space for further comment on Q19 - however, we'd like to provide some further commentary here on the option:

'*Expanding out from the water body level to report on a whole catchment*'.

The comments below provide additional evidence on why this is important for freshwater habitats.

Important biodiversity declines are not picked up by WFD monitoring

More representative landscape-scale monitoring is critical, because there is evidence that declines in the condition of the freshwater environment are occurring that are not being detected by WFD monitoring.

For example, national surveying by the Botanical Society of Britain and Ireland (BSBI) shows that freshwater and wetland plants have markedly declined across landscapes since the early 1990s (Figure 1A).[14] This trend is mirrored by census data from our Water Friendly Farming project, which shows a significant 16% decline in whole-landscape freshwater and wetland plant richness over the past 13 years (Figure 1B).

These declines are not evident from WFD river biological monitoring, where the data indicate improvements followed by plateauing during this period. Indeed, these large-scale changes cannot be detected by WFD river monitoring which, although often imagined to be representative of freshwater as a whole, does not tell us what is really happening in our landscapes. Expanding WFD monitoring across whole catchments is clearly essential to capture trends (positive and negative) that are currently going unnoticed, ensuring that policy decisions are grounded in the most relevant evidence.

The interconnectedness of freshwaters

WFD is built on a now-outdated model of freshwater biodiversity, which treats waterbodies individually, as largely closed systems. Substantial evidence now demonstrates that metapopulations[*] of freshwater species are interconnected across freshwater habitats of all kinds, allowing species to spread between sites, recolonise after disturbances, and maintain genetic diversity. This

[*] A metapopulation is a group of populations of the same species which are separated by space but interact with each other – a 'population of populations'.

interconnectedness underpins the resilience of freshwater ecosystems: it is an essential part of their ability to recover from human impacts.

Expanding WFD monitoring to encompass smaller waters across the catchment would enable the health of this freshwater ecosystem network to be evaluated as a whole.

Small waters can bring back clean water

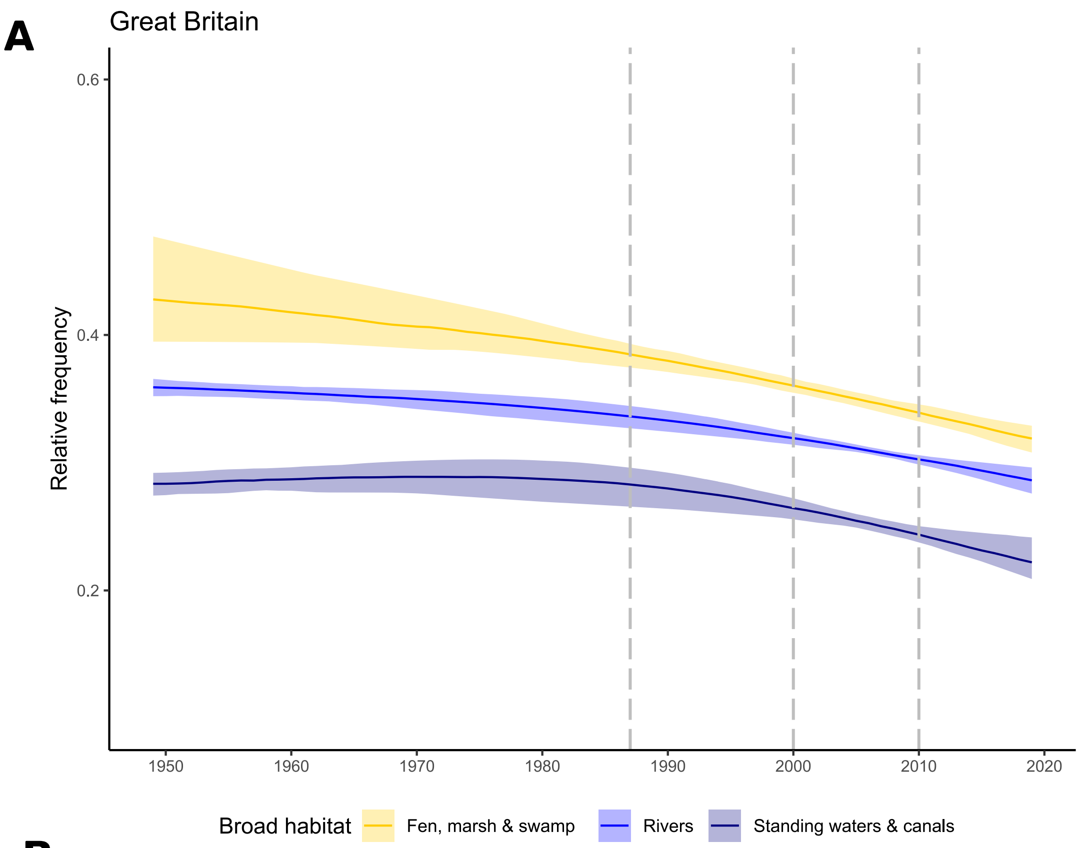
More comprehensive cross-landscape monitoring would also pave the way for much more effective restoration of the water environment at large – via an increased focus on small waters.

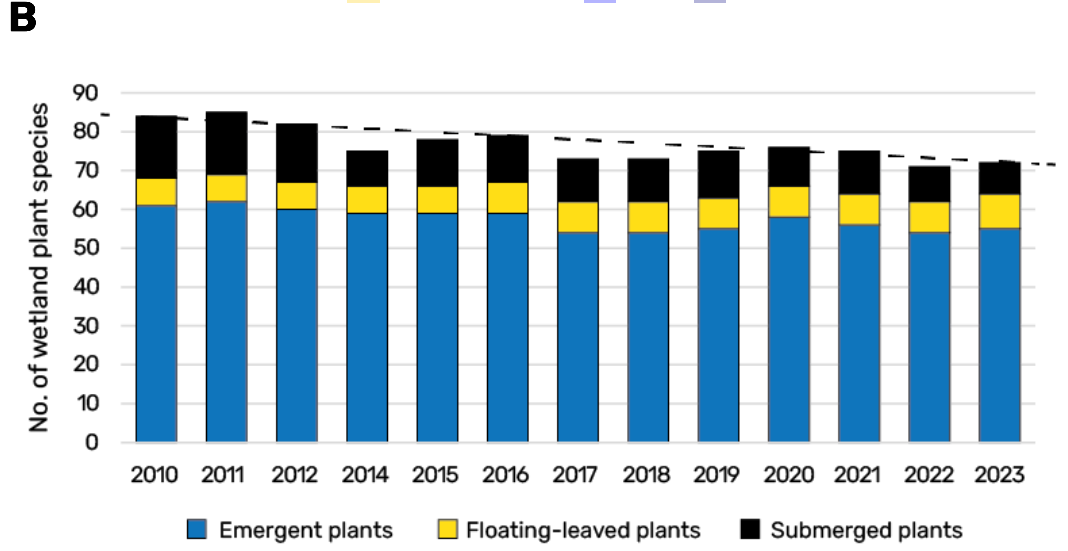
Because small waters have small catchments, they can be created or restored in pockets of unpolluted land, immediately adding to the clean water resource at landscape scale.[11] These interventions create refugia for declining pollution-sensitive species, preserving source populations of these species and buying time for longer-term efforts to mitigate pollution in large rivers and lakes. Figure 2 **Error! Reference source not found.**demonstrates the contribution that these measures can make to supporting freshwater biodiversity as a whole. These benefits generally occur faster (Figure 2) and at much lower cost than, for example, re-engineering bigger rivers.

The OEP has also noted that working with small waters in headwater catchments could be a particularly effective way of tacking diffuse agricultural pollution – something which is currently proving costly and largely intractable, with little chance of achieving targets. Specifically, in their most recent review of Environmental Improvement Plan progress, they note that:

> 'Larger changes in land use are likely to be required beyond the commitment of 10–15% of land on all farms to achieve freshwater outcomes. A practical intermediate step could be *to focus interventions on smaller upper catchments, where larger proportions of catchments could be de-intensified with greater ecological benefits.'*

Figure 1. A: Long-term national trends for wetland plant species, plotted as medians with 90% uncertainty intervals, from the Botanical Society of Britain and Ireland's Plant Atlas 2020. **B**: Persistent decline in wetland plant species richness over 13 yrs in the Barkby catchment (Leicestershire), from Water Friendly Farming project census data (ongoing). Updated from Williams et al. 2020.[11]





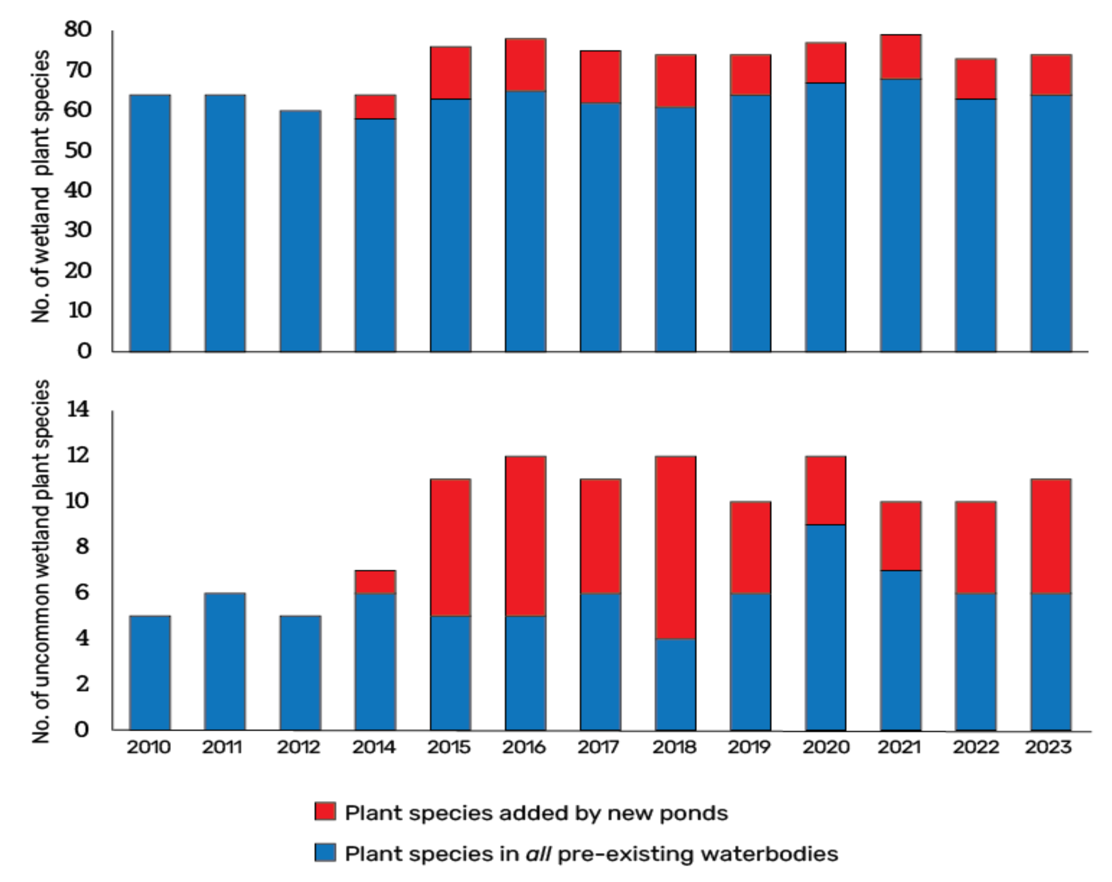


Figure 2. The value of pond creation.

Promoting pond creation can deliver significant and lasting biodiversity benefits at landscape scale. In the Water Friendly Farming project (WFF), doubling pond density by adding 20 clean water ponds across a 10 km^2 farmland area (total pond area < 3 ha) led to:

- A 16% increase in overall wetland plant species richness.
- An 80% rise in regionally rare species.
- Sustained gains maintained over 13 years.

WFF is a collaboration between Freshwater Habitats Trust, the Environment Agency, University of York and Game and Wildlife Conservation Trust.

Q54. Which of the following changes to water industry environmental regulatory requirements, if any, would improve outcomes from the sector? (Please select all that apply)

☒Legislative reforms to address current and emerging threats

In our view, the regulatory drivers for water industry environmental investment are poorly designed, and deprioritise investment in smaller wastewater treatment works, to the detriment of the water environment.

Environment Act wastewater target

The Environment Act wastewater target aims to cut the amount of phosphorus (P) in treated wastewater released into freshwaters by 80%, compared to levels in 2020. This target focuses on reducing the total volume of P released in treated effluent across the entire country's sewerage system, directing water sector investment to larger sewage treatment works, where it is cheaper to make these reductions. As a result, smaller works are generally neglected, even though many discharge into small streams with limited capacity to dilute pollution - meaning that a relatively small volume of P can cause severe ecological damage.

Headwater streams make up c.70% of the river network, and seem to have benefitted less from documented improvements to river water quality during the 1990s and 2000s – which may be a result of this underinvestment in small wastewater treatment works. A recent pan-European study found that headwater stream ecological status declined consistently with increasing percentage of effluent. Streams exceeding 6.5% effluent volume were shown to be unlikely to achieve high or good ecological status (**Error! Reference source not found.**).[15] Because of their position in the river network, small streams are not affected by cumulative upstream pressures in the same way as larger rivers, meaning upgrading problematic wastewater treatment works could deliver marked, 'silver bullet' improvements to water quality in many cases.[†]

If a biological, outcomes-focused water pollution target were instated (such as the OEP's recommended 'wildlife rich open water' target - see above), water industry investment could be directed to deliver greater environmental improvements, for instance by increasing the proportion of investment directed

[†] Following a detailed review by Freshwater Habitats Trust and water industry specialists, undertaken as part of the CaSTCo project, a new approach to these smaller works -recognising their importance and integrating upgrades with management of the whole water environment - has been developed. This 'Headstart' programme will put into practice work to capitalise on the benefits of mainstreaming headwater catchment management, and ensuring it is a key component of River Basin Management Plans.

towards smaller streams, and wastewater treatment works discharging into semi-natural catchments (e.g. the New Forest).

Expanding the scope of catchment-based measures

Catchment measures (e.g Catchment Nutrient Balancing) are intended to encourage the water sector to meet required nutrient reductions through alternative methods, such as mitigating agricultural pollution - rather than through wastewater improvements where this is likely to be less cost-effective.

The Environment Agency has reviewed Catchment Nutrient Balancing (CNB), finding it to be 'ineffective and unworkable as a regulatory mechanism', and has indicated its intention to withdraw CNB options in AMP8.

Our view is that the inefficacy of CNB arises from the regulatory drivers, rather than the approach itself. Current regulations are solely focused on reducing pollutant emissions to the main receiving water, limiting the scope of catchment-based measures. The water industry should be given greater flexibility to enhance catchments as a whole.

In this vein, we think a portion of water industry investment should be freed up for creation and restoration of offline freshwaters. Although these measures would not reduce pollution to the main river, they would add to the sum of clean water across the catchment. In many instances, the creation or restoration of offline freshwaters in pockets of land free from pollution will be the only way to quickly restore high-quality freshwater habitats to the catchment.

In addition, by focusing agricultural measures on smaller catchments, as recommended by the OEP (see above), there would be a much greater chance of meaningfully reducing nutrient pollution. This is because it is much more feasible to deintensify large proportions of small headwater catchments (e.g. arable to low input grass or woodland) - the only method reliably proven to substantially reduce nutrient inputs.

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