



The Freshwater Network

Wilder, wetter, cleaner, connected

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Freshwater Habitats Trust is the UK’s leading charity for all freshwaters. As an evidence-based conservation organisation, we carry out scientific research and practical conservation work to protect life in freshwater. With our partners, we are building the Freshwater Network, a national network of wilder, wetter, cleaner and connected freshwater landscapes, to reverse the long decline of freshwater wildlife.





The Freshwater Network

Wilder, wetter,
cleaner, connected

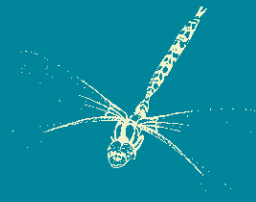
Freshwater biodiversity is declining,
and we need big ideas to protect it.

The Freshwater Network gives us
a chance to achieve a reset for
freshwaters. It brings together
the best of new scientific research,
rigorous analysis of established
practices and traditional
conservation concepts to build a
better future for freshwater.

The vision

The Freshwater Network is based on four principles

1



Protect the best

At the heart of the Freshwater Network is the simple, powerful concept: 'protect first, then repair'. Taking this approach means we can preserve high-quality habitats as a foundation for broader ecological recovery.

“ The UK has traditionally placed most emphasis on cleaning up pollution first, and protecting what is in good condition has often come second. Instead, by protecting and then building out from our most important freshwater habitats, we can create connected networks of freshwaters large and small, allowing species to spread to new sites and respond to climate change. ”



Professor Jeremy Biggs,
CEO, Freshwater Habitats Trust

2

Start with the smallest

The Freshwater Network means a radical rethink: focus on small waters and wetlands because of their power to regenerate freshwater landscapes. These small habitats are often overlooked, yet they make up 80% of the freshwater environment¹ and are critical for biodiversity.



“ We can make the quickest progress for freshwater life by putting small waters at the heart of water management. By focusing on small headwater catchments and creating new clean water ponds, we can rapidly establish high-quality habitats that drive the recovery of life in freshwater. ”



Dr Pascale Nicolet, Technical Director,
Freshwater Habitats Trust and CEO,
Newt Conservation Partnership

Treat freshwaters as a network



Freshwater plants and animals need a network of different types of habitats for their populations to thrive - not just individual isolated ponds or stretches of river. Through the Freshwater Network, we can manage waterbodies as interconnected and interdependent habitats.

“Treating freshwater habitats as a network is essential for biodiversity conservation because most freshwater species use multiple habitat types - not just rivers or ponds or lakes or wetlands. Managing waterbodies as interconnected and interdependent habitats, creating ‘freshwater landscapes’, is essential for effective biodiversity conservation.”

Pete Case, Technical Director, Freshwater Habitats Trust and Newt Conservation Partnership



Bring back clean water

Clean water is vital for biodiversity but is now a very scarce resource. The Freshwater Network will restore unpolluted water in the landscape, taking a critical step for freshwater protection.



“Tackling pollution in our larger rivers and lakes is vital, but we need to give equal weight to small waters. Because of their small catchments, small freshwaters can be protected from pollution, even in urban or intensively managed landscapes. By restoring and creating small waterbodies in pockets of land protected from pollution, we can bring clean water back to our towns and countryside.”

Dr Naomi Ewald, Technical Director, Freshwater Habitats Trust

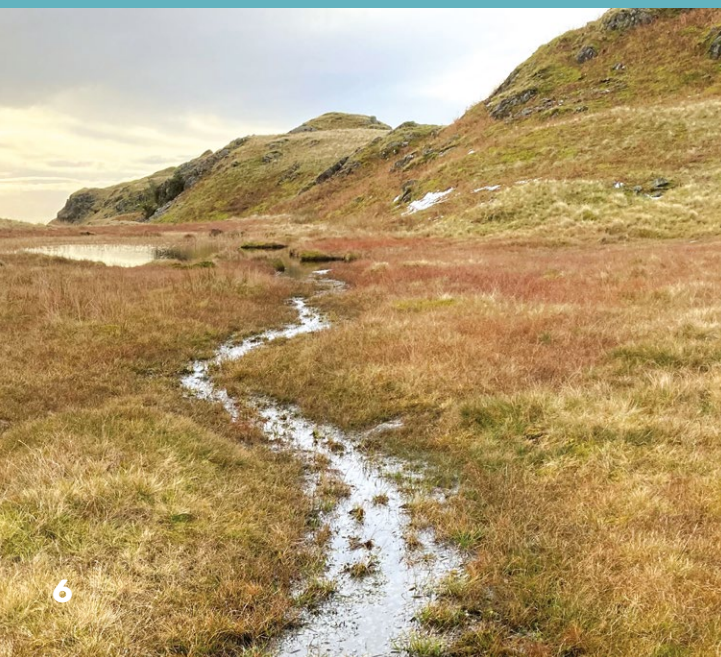




Not so small after all?

Researchers estimate that 80% of the network of freshwater habitats is made up of small waterbodies.²

Globally, about 60-70% of the running water network by length is made up of small streams. Ponds typically outnumber lakes 100:1.



A solution to the freshwater biodiversity crisis

Life in freshwater is under severe threat. Globally, these habitats and the plants and animals they support are among the most vulnerable parts of the natural world, prompting widespread calls for new measures to protect them. In the UK, freshwater wildlife is declining across the landscape, with pollution-sensitive species decreasing the fastest.

Freshwater habitats are under threat

Ponds have been lost in vast numbers since 1900, and there have been substantial losses of biodiversity in recent decades, even from nature reserves and Sites of Special Scientific Interest (SSSIs).

Our rivers are among the worst in Europe: very widely damaged by pollution and centuries of physical modification. They continue to be degraded by a cocktail of pollutants and other pressures, losing water plants and supporting a fraction of their historic biological riches.

Only 16% of English rivers and canals reach Good or High ecological status in the Water Framework Directive classification^{3,4}. Beyond the channel, about 70% of river floodplains are damaged by intensive land use, drainage and pollution, and are one of the least protected parts of the water environment.

Lakes are as widely degraded by human impacts as they have ever been. The north of Scotland is now the only region in Britain with larger lakes in good condition. The worst effects of acid rain have probably now passed in the uplands, but lakes have not fully recovered. Since 2010, the proportion of lakes classified as Good or High status under the Water Framework Directive has steadily declined, despite some local improvements from better nutrient pollution control.

Other freshwater habitats, including fens, ditches and headwater streams, are largely unmonitored and are facing the same threats.



Species are declining

Across the UK, habitat loss and pollution continue to drive species declines, with around 1,000 freshwater species now listed as rare or threatened: an alarming 25% of all those assessed.

Iconic species like Atlantic Salmon (*Salmo salar*), European Eel (*Anguilla anguilla*), White-clawed Crayfish (*Austropotamobius pallipes*), Water-violet (*Hottonia palustris*) and Freshwater Pearl Mussel (*Margaritifera margaritifera*) are on long downward trends. Freshwater plant species that were once widespread have become vanishingly rare. Recent evidence shows they have been declining by 1% every year since 2010 in agricultural landscapes typical of large parts of the lowlands.

Climate change is having a rapid and unpredictable impact and is affecting species in different ways. For example, it's allowing some species of dragonflies and damselflies to spread, while others are declining with their populations shrinking into ever more northerly areas. With so many of our freshwaters now isolated and polluted, vast areas are now inhospitable to the movement of species.

Other efforts are failing

In the UK, we've traditionally placed most emphasis on cleaning up pollution first and protecting what is in good condition second. This has led to a practical focus on piecemeal improvements to polluted and damaged sites through point source pollution control, attempting to reduce diffuse pollution and repairing damage to river morphology. Only sewage clean-up has had any large-scale measurable impact for biodiversity.^{5,6} Despite this, all of the freshwater environment remains damaged, stressed and threatened.

By safeguarding the remaining high-quality freshwater strongholds and expanding out from them, we can better protect freshwater biodiversity. This approach automatically shifts effort to where the most important biodiversity occurs. It moves us away from an historical focus on just rivers and large lakes, to encompass a much broader range of critical freshwater habitats – many of them small and manageable – where rapid and effective progress can be achieved.



Water for wealth and wellbeing

Freshwaters support recreation and tourism, with the total benefits of England's freshwater fisheries valued over £1.7 billion.⁷

In 2020, 2.2 million people in the UK gained health benefits from exposure to freshwater habitats, worth an estimated £739 million in avoided healthcare costs.⁸





European Eel (*Anguilla anguilla*)



Water-violet (*Hottonia palustris*)



Freshwater Pearl Mussel
(*Margaritifera margaritifera*)

Recovery is possible

Despite the worsening picture for freshwaters, recovery is eminently possible. It has happened for the Eurasian Otter (*Lutra lutra*) after highly toxic organochlorine pesticides were banned in the 1980s, and for Bittern (*Botularis stellaris*) as a result of wetland habitat creation.

But to achieve recovery for other species, we need to refocus. We need to put clean water back in the countryside. And we need to expand the range of habitats that we prioritise for creation and restoration.

Small waterbodies include many of the best remaining freshwaters. That's because their small catchments are more likely to be non-intensively used, so they are better protected from pollution.

We know from our own conservation work that it is relatively easy and cost-effective to create clean water ponds, which are quickly colonised by wildlife, including rare and threatened species. In a typical agricultural catchment in Leicestershire, adding just 20 clean water ponds to double pond density in a 1,000-hectare catchment increased whole landscape aquatic plant richness by 16%, and rare plant richness by 80%.⁸

We also know that restoring small fens can bring nationally declining species back from the brink. This is one of the many reasons the Freshwater Network pays more attention to these smaller habitats.

This shift in understanding of where biodiversity exists on the ground demands a complete reset in how we approach freshwater conservation.

“It's shocking to realise that we have no practical understanding of where the most critical areas for freshwater biodiversity are found in our landscapes. There is no map that identifies the key hotspots and what is found there. Without this information it is impossible to develop effective plans to protect and restore biodiversity.

“Until very recently, the most important areas for freshwater were assumed to be river focussed. But now that we've begun to map where important areas for biodiversity occur, a very different picture emerges: habitats

like fens, ponds and floodplain grassland often turn out to be critical hotspots.”



**Penny Williams, Technical Director,
Freshwater Habitats Trust**





The Critically Endangered Glutinous Snail (*Myxas glutinosa*) was once widespread in Britain but is now only found at Llyn Tegid in Gwynedd, northwest Wales, mainly due to water pollution. Llyn Tegid is also one of a dozen sites in Britain where the Whitefish (*Coregonus laveratus*), a freshwater herring known in Wales as the 'Gwyniad', is found. Llyn Tegid fails to reach Good status under the Water Framework Directive because of nutrient pollution.



For the majority of freshwater plants and animals (with the exception of most large fish species) waterbodies don't need to be physically connected to provide a network of habitats². Water plants living on pond margins are also found on river margins; Common Toad (*Bufo bufo*) – pictured here – breeds in lakes and ponds and slow-flowing river backwaters; the mayflies of fast flowing running waters also live on well-oxygenated, wave-washed lake shores.



The River Manifold near Leek in Staffordshire is home to one of Britain's rarest mayflies, the Northern Summer Mayfly (*Siphonurus alternatus*) and supports High status plant and aquatic invertebrate communities.

Building the Freshwater Network

The Freshwater Network will be created using two building blocks

1

Important Freshwater Areas

The remaining high-quality places, which will be protected and maintained.



2

Wetland Opportunity Areas

Places to improve, where, together, we will restore and create habitats to build out from Important Freshwater Areas.

Floodplain restoration at the National Trust
Buscot and Coleshill Estates, Oxfordshire.

Important Freshwater Areas

Our priority is to protect the best freshwater sites - the 'good bits' that are home to the richest communities of sensitive and vulnerable plants and animals, including freshwater Species of Conservation Concern¹⁰. These are the areas that are essential for maintaining the diversity of freshwater life.

Britain still has some of the highest-quality freshwater habitats in Europe, but their wildlife is isolated and increasingly under threat. Stopping the decline of these sites will protect the rare plants and animals that often make these places special, providing the source for recovery across the rest of the landscape.

From stretches of rivers that are home to threatened species like Loddon Pondweed (*Potamogeton nodosus*) and Freshwater Pearl Mussel (*Margaritifera margaritifera*), to tiny calcareous springs and flushes supporting endangered aquatic craneflies and rare mosses, Important Freshwater Areas represent the most critically important habitats for freshwater wildlife.

They include clusters of unpolluted ponds where endangered plants, such as Lesser Water-plantain (*Baldellia ranunculoides*), are still hanging on, headwater streams supporting populations of native White-clawed Crayfish and gravel pits with stoneworts, which can only survive in exceptionally clean waters.

Important Freshwater Areas can be individual sites, groups of sites or networks of many different freshwater habitat types.



Oblong-leaved Sundew (*Drosera intermedia*)

Mapping Important Freshwater Areas

To reverse the decline in freshwater biodiversity, we know that we need to protect the best remaining habitats. But there is still no single map or database which identifies the most important sites for freshwater wildlife.

We are now working with our partners to carry out Important Freshwater Area assessments. Identifying these high-quality places across the UK, using criteria agreed by national experts and specialists, means these habitats can be recognised in conservation policy and planning.¹¹

Important Freshwater Areas then need targeted management and special protection to ensure we don't lose the best remaining habitats for freshwater biodiversity.



World's End is a Site of Importance for Nature Conservation (SINC) in North Yorkshire. With a mosaic of fen meadow, acidic grassland, heathland and ponds, the site is managed by the Forestry Commission and is well known for dragonflies.

Important Freshwater Areas: Protecting the best



Restoring Oxfordshire's alkaline fens

Oxfordshire has an internationally important concentration of alkaline fens, an endangered wetland habitat fed by calcareous springs. These small, difficult-to-manage, places have become isolated and neglected, leading to the decline of special plants and animals. The Oxfordshire Fens Project works with local experts, volunteers and landowners to protect the county's alkaline fens. Restoration and management of 11 sites has restored populations of threatened species. Monitoring is tracking the biological and hydrological changes and wider environmental influences.

This practical work is complemented by research and advocacy, to increase our understanding and communicate the importance of Oxfordshire's fens. We have identified around 70 sites and mapped their ground- and surface water catchments. This has supported a first-of-its-kind local planning policy, specifically designed to protect the catchments of these hydrologically sensitive habitats from development impacts.



Protecting pristine habitats in the New Forest

Through our Wilder for Water and Blue Horizons projects, we're taking practical steps to protect the species-rich clean water habitats of the New Forest. Here, we're focusing on the small freshwater and wetland habitats that make up most of the water environment and support most of the rare freshwater species found in the New Forest – some of which are extinct almost everywhere else in the UK.

Addressing improvements to both the running and standing water network, we're working with local landowners to reduce diffuse pollution, increase water storage capacity and restore habitats around the edge of the Forest. With our partners, we're also increasing understanding of land use impacts on water quality.

Bringing a rare aquatic plant back to Skipwith

Skipwith National Nature Reserve in North Yorkshire is one of the last remaining areas of lowland heath in northern England. Comprising a mixture of wet heath, ponds, mires, fens, reed-beds, wet woodlands and damp scrub it is rich in high-quality freshwater habitats.

The 270-hectare site is an ancient landscape supporting several of Britain's most endangered freshwater plants and animals, including the rare aquatic fern Pillwort (*Pilularia globulifera*). This Priority Species is declining rapidly throughout its north-west European range and the UK now holds a substantial proportion of the global population.

Pillwort is synonymous with Skipwith and the site even has a pond named after the aquatic fern – 'Pillwort Pond'. But it was thought that the pollution-sensitive plant had been entirely lost from Skipwith until, in 2017 following restoration work on a number of the reserve's ponds, Pillwort reappeared in one of the managed waterbodies. Since then, local naturalists and volunteers have been working with Freshwater Habitats Trust to translocate Pillwort to other restored and new ponds on the reserve. Pillwort is once again thriving at Skipwith – including in Pillwort Pond. Freshwater Habitats Trust and partners are closely monitoring the plant, using drones to carry out aerial surveys.



Great Crested Newt (*Triturus cristatus*)

Freshwater species

England and Wales has an estimated:

4,200
species of
freshwater
invertebrate

640
mosses,
lichens and
liverworts

240
vertebrates
found in or
on water

740
wetland plant
species
(excluding
hybrids)

1,000
freshwater Species of
Conservation Concern


Wetland Opportunity Areas

Wetland Opportunity Areas are the places where freshwater habitats can be created and restored to expand and link Important Freshwater Areas. Here, we'll establish high-quality freshwater and wetland habitats so wildlife can recolonise from remaining biodiversity hotspots.

Clean water ponds, small lakes and wetland habitat will be created or restored, and land will be de-intensified to clean-up our streams and rivers. All of this will bring unpolluted water back to our towns and countryside.

We have identified Wetland Opportunity Areas in places that are less intensively managed or where habitat creation or land deintensification could occur to improve water quality. These include woodland and forest, priority river habitat headwater areas, low-intensity grassland and alluvial river valleys.

Wetland Opportunity Areas allow rich, diverse and near natural freshwater communities to spread back into our landscapes: from protected sites and nature recovery networks, damaged SSSIs and drained moorland bogs, to new woodlands, unfertilised grasslands and retired farmland.



Temporary floodplain pond in the New Forest, shaped through natural processes and historic human activity.

Small but mighty

At a landscape-scale, ponds usually support more species of macroinvertebrates and plants than lakes or rivers, including rare and sensitive species.¹²

Up to 30% of a river's macroinvertebrate diversity can be restricted to its headwaters.²

© Boothby Wildland



New clean water ponds created at Boothby Wildland in Lincolnshire to strengthen and extend the area's Freshwater Network.

Building out

Newt Conservation Partnership: creating hundreds of clean water ponds

As part of the NatureSpace Partnership, Freshwater Habitats Trust and Amphibian and Reptile Conservation are working with the Newt Conservation Partnership to create and restore habitat for Great Crested Newt (*Triturus cristatus*). Many of these sites are in Wetland Opportunity Areas across England. This work is addressing the impact of development on the species and NatureSpace has secured organisational licences for local planning authorities, as well as for all of Network Rail's operational regions.

For each occupied pond lost to development we work with landowners to create or restore at least four compensation ponds. Between April 2018 and December 2024, the Newt Conservation Partnership created or restored 438 clean water ponds and provided 1,388 hectares of new terrestrial habitat for Great Crested Newts.

Great Crested Newts have been found at 84% of pond sites after three or more years. Individual ponds created or restored through the scheme are more than twice as likely to be occupied by Great Crested Newts than the average English pond. The scheme also provides wider benefits, with priority species, including nationally and regionally rare plants, recorded at many sites.

© Newt Conservation Partnership



Expanding high quality freshwater habitats in Nidderdale National Landscape

In North Yorkshire, Nidderdale National Landscape and Freshwater Habitats Trust are collaborating to deliver new habitat across 17 sites, building out from existing biodiversity hotspots. This will add over 75 wetland habitats, including new and restored ponds, wetland scrapes and swales, within strategic areas which are associated with clean water and will benefit a wide range of species.

Previous work with partners, volunteers and landowners to identify Nidderdale's priority ponds means habitats are being created where they will make a real difference in improving and extending the network for wildlife.

A stepping stone for wetland birds in Buckinghamshire

As co-hosts in the River Thames Catchment Partnership, Freshwater Habitats Trust is working with River Thames Conservation Trust and other partners to begin the creation of the Oxfordshire-Buckinghamshire Freshwater Network. In 2019, the partners began creating the Eythrope Wetland on the Waddesdon Estate – the first wetland mosaic habitat of its kind in the Thames catchment.

This complex of pools, ponds, wet grassland and backwaters provide a diversity of habitats for freshwater plants and animals and is an important 'stepping stone', connecting two key areas for wetland birds in the catchment. Since site work was completed in 2020, 122 species of birds, including Teal (*Anas crecca*), Lapwing (*Vanellus vanellus*) and Ringed Plover (*Charadrius hiaticula*) have been recorded at the Eythrope Wetland.

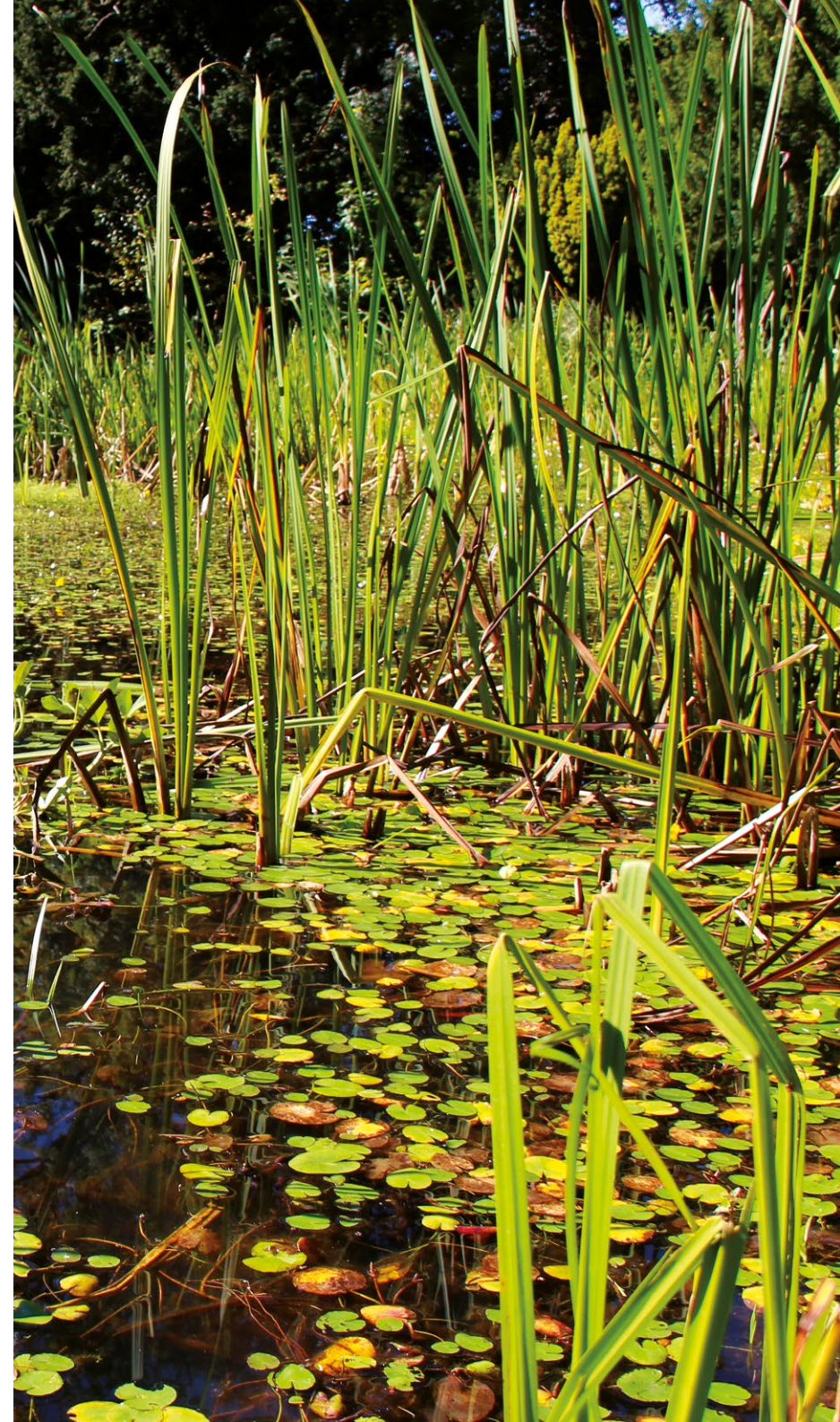


The Eythrope Wetland on the Waddesdon Estate

Freshwater Network success

Six key performance indicators will be used to measure the success of the Freshwater Network. Many of these focus on smaller waterbodies and wetlands because these habitats offer the quickest and most effective way to make improvements.

- 1** No reduction in the extent and quality of high-quality freshwater and wetland habitats, ensuring that the quality of Important Freshwater Areas (e.g. freshwater and wetland SSSIs and priority habitats) is maintained and where necessary restored.
- 2** At least double the number of clean water ponds, with the number of Priority Ponds in Good condition (based on PSYM¹³ assessment) on a measurable upward trajectory – we single out ponds because they are so important to the recovery of freshwater biodiversity and the success of the Freshwater Network.
- 3** At least double the extent of other freshwater habitats at High status under Water Framework Directive, including headwaters, larger rivers and lakes and other wetlands (e.g. fens, wet grasslands, reed beds, blanket bogs) at Favourable condition under the Habitats Regulations.¹⁴
- 4** All freshwater Species of Conservation Concern¹⁰ have ranges and/or populations which are increasing in size.
- 5** Whole landscape freshwater biodiversity, currently completely unmonitored, is shown to be increasing as a true test of the Freshwater Network approach.
- 6** All freshwaters and wetlands are recognised and managed as an interdependent, but not necessarily physically connected, network.



Maximising recovery with the Freshwater Network

The Freshwater Network approach can be applied to all landscapes and at all spatial scales. To be strategic and achieve the most effective outcomes in the short to medium term, the Freshwater Network places a special emphasis on biodiversity delivery within three national geographic zones.



Important Freshwater Landscapes

Using the best available data, 24 of the most critical regions for freshwater biodiversity have been identified in England and Wales.



Historic Floodplains

The Freshwater Network will restore historic freshwater hotspots inside the one in 100-year floodplain by building networks of high-quality freshwater sites for wildlife.



Water Friendly Landscapes

Here, habitats will be created and restored to provide pathways for species to move across the landscape, adding further links outside of Important Freshwater Landscapes and Historic Floodplains.



Important Freshwater Landscapes

Important Freshwater Landscapes are extensive regions with nationally significant concentrations of freshwater biodiversity, rich in threatened plants and animals. These places, from upland river landscapes to lush lowland pondscapes, are under threat, but they are also our biggest hope for freshwater biodiversity recovery.

Each Important Freshwater Landscape has six or more adjacent 10 x 10 km grid squares with either:

- More than 20 freshwater Species of Conservation Concern, or
- More than 30 km of streams and rivers with High status invertebrate communities.¹⁸

The 24 Important Freshwater Landscapes cover 36% of England and Wales. This represents a significant opportunity: knowing which parts of the country are most important for freshwater life will allow us to better target measures to safeguard those areas, creating a shift in the way we protect our highest-quality freshwaters.

A national drive to recognise, protect and restore all freshwater habitat types at landscape scale in these regions could signal a pivotal moment in the recovery of freshwater species. In the long-term, it could achieve naturally functioning, self-sustaining populations of freshwater plant and animal species.

How many habitats?

Britain has an estimated:

8,980
lakes¹⁵

470,000
ponds¹⁶

92,500 km
rivers¹⁷

179,000 km
streams¹⁷

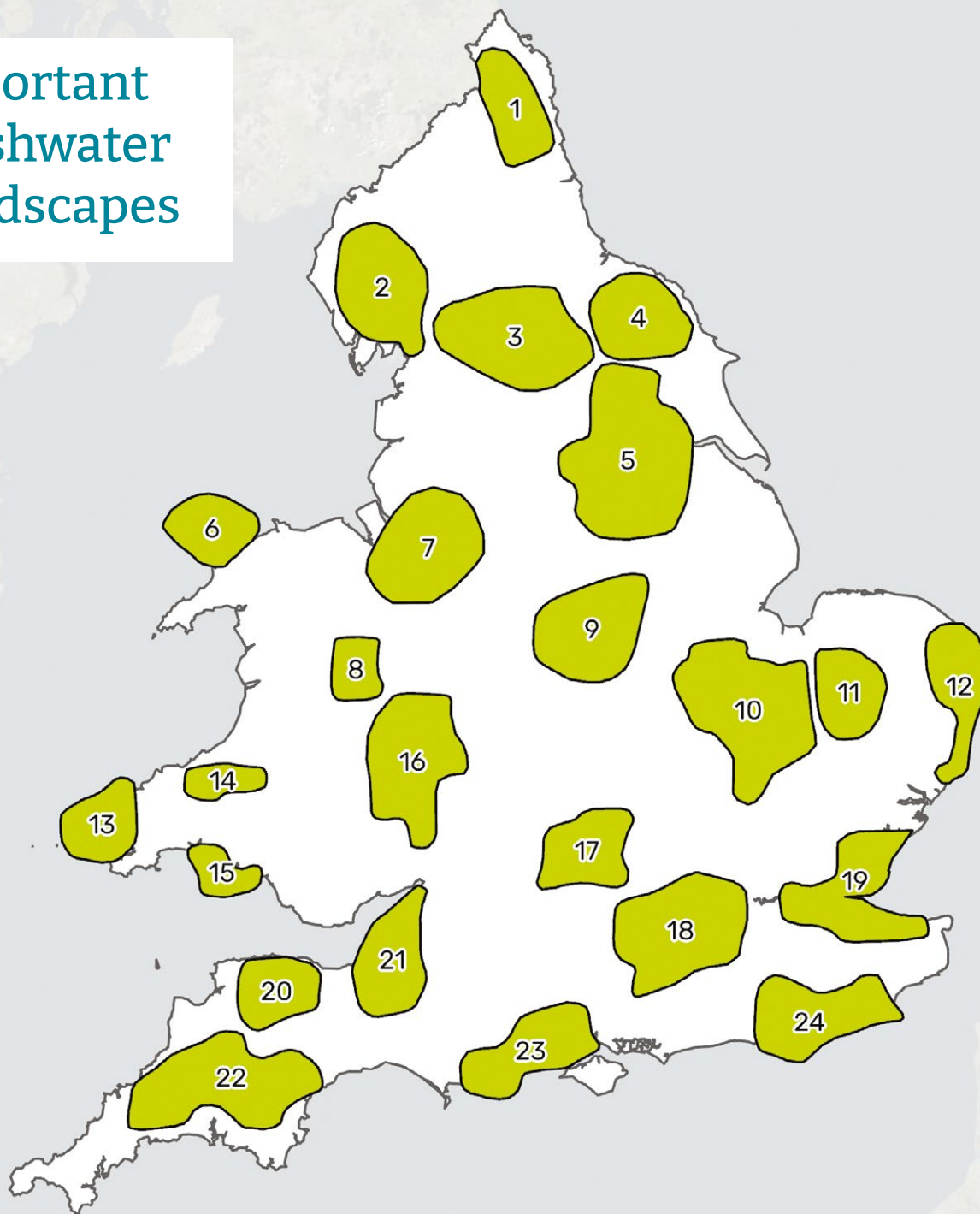
608,000 km
ditches¹⁷



24 Important Freshwater Landscapes have been identified where we can:

- Protect the best remaining habitats through practical conservation
- Reconnect fragmented Important Freshwater Areas
- Secure national recognition of the value of Important Freshwater Landscapes as freshwater biodiversity hotspots to drive conservation work, ensuring their protection for future generations.

Important Freshwater Landscapes



- 1.** Cheviots and surroundings
- 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 Mid Cornwall
- 23.** New Forest and Dorset Heaths
- 24.** South Coast and the Weald

New Forest and Dorset Heaths Important Freshwater Landscape

The New Forest and Dorset Heaths Important Freshwater Landscape is home to a remarkably high number of Species of Conservation Concern. It also includes the largest Important Freshwater Area identified so far: the New Forest, which boasts pristine freshwaters, wetlands and coastal habitats.

Here, this is a real opportunity for freshwater recovery. Building out from biodiversity hotspots into Wetland Opportunity Areas would expand the landscape's high-quality freshwater habitats, enabling species to spread out and ensuring the long-term resilience of this Important Freshwater Landscape.

Despite its high number of biodiversity hotspots, this Important Freshwater Landscape remains fragmented and faces threats such as pollution and pressure from tourism. Much also remains to be discovered about the rare species living here, many of which are close to extinction nationally.



Headwater stream in the New Forest



Heathland pool in the Dorset Heaths



The River Cover in the Yorkshire Dales and Forest of Bowland Important Freshwater Landscape. The river has a Water Framework Directive High status aquatic invertebrate community.

Restoring Historic Floodplains

Most floodplains are severely damaged by centuries of drainage and pollution. Focused on land inside the one in 100-year floodplain, restored Historic Floodplains will benefit people and freshwater nature from city to countryside, from rewilded wet forests to rich riverine grasslands. Sometimes farmed, sometimes set-aside for wildlife, new habitats created on floodplains should, as far as possible, be protected from pollution from the river channel.

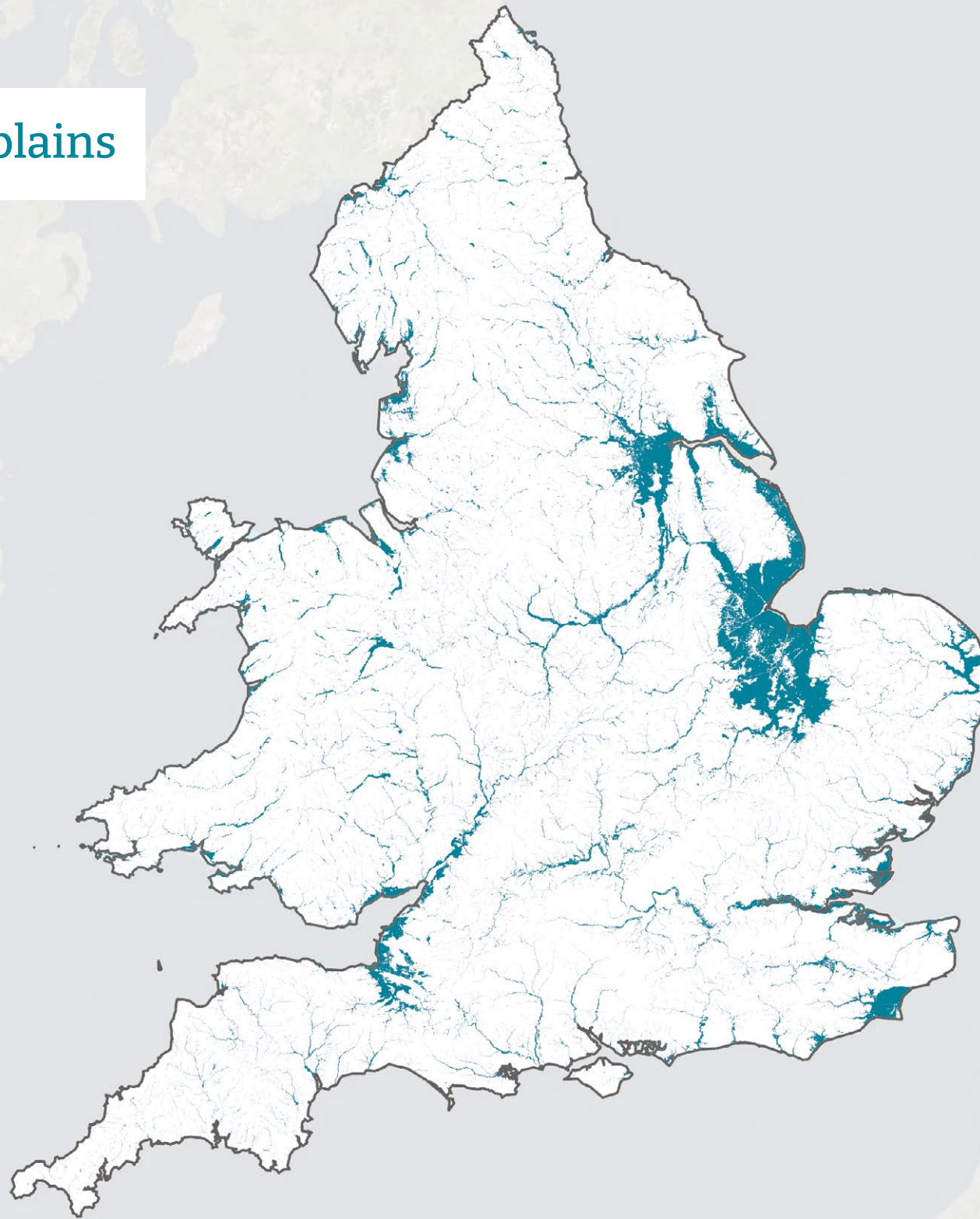
Extending over about 16,000 km², the 1:100 flood zone occupies about 11% of the land area of England and Wales. The Historic Floodplain is approximately 15% urbanised and 85% green space, making it a major opportunity area for freshwater biodiversity protection and restoration.

Historic Floodplains are a part of every Important Freshwater Landscape and are a dominant feature of five: Yorkshire Lowlands, Cambridgeshire Fens, Thames Estuary, Norfolk and Suffolk Broads, and the Avon and Somerset Levels.

Many Historic Floodplains have been identified as Wetland Opportunity Areas where we can:

- Create routes for species to disperse between Important Freshwater Areas and, at national level, between Important Freshwater Landscapes.
- Work from the top of catchments down, changing land use in the floodplain to restore the river and stream environment.
- Create new small freshwater and wetland habitats on floodplains not connected directly to polluted running waters, providing clean water refuges for the many pollution-sensitive freshwater species.

Historic Floodplains



Pinkhill Meadow

About a quarter (24%) of Oxfordshire's Important Freshwater Areas comprise floodplain habitat and this includes Pinkhill Meadow.

In 1990, Freshwater Habitats Trust worked with Thames Water and the Environment Agency to create a new pond complex at Pinkhill Meadow, which is on Historic Floodplain within the Pinkhill and River Thames Floodplain at Farmoor Important Freshwater Area. This was an opportunity to trial new ideas about floodplain restoration, pond design and the creation of wetland mosaic habitats.

The site features waterbodies of different sizes, depths, permanence and water source. Crucially, all are unpolluted - despite being close to the River Thames. Additional habitats were created in 2022-23, further extending the network of habitats for wildlife.

Now recognised as an Important Freshwater Area, Pinkhill has a high number of Priority Ponds and around 20% of Britain's wetland plants and freshwater invertebrates have been recorded at the site. This includes uncommon aquatic plants such as Rough Stonewort (*Chara aspera*), Bristly Stonewort (*Chara hispida*) and Blunt-leaved Pondweed (*Potamogeton obtusifolius*).





This pond at Cock Marsh on the floodplain of the River Thames in Berkshire and managed by the National Trust is a priority habitat and one of Britain's finest freshwater habitats. It is a practically perfect combination of clean water, trampling by livestock, seasonal drying, dense and open varied vegetation density and marginal shade.



What is clean water?

Clean water means water that has a chemistry and biology which would be normal for the area in the absence of significant human impacts. It is equivalent to 'High' status in the Water Framework Directive and 'Good' status in the PSYM¹³ system for ponds and small lakes. It is sometimes called 'the natural background', 'minimally impaired' or 'the reference condition'.

Water Friendly Landscapes

Land outside of Important Freshwater Landscapes and Historic Floodplains is arguably the most depleted for freshwater wildlife. Yet, these Water Friendly Landscapes can provide opportunities to create or restore unpolluted freshwater habitats.

Water Friendly Landscapes could be areas of woodland, land within nature reserves, re-wilded areas, unfertilised grassland, or areas of arable reversion. These are places where it is possible to create or restore freshwater habitats with clean, unpolluted water.

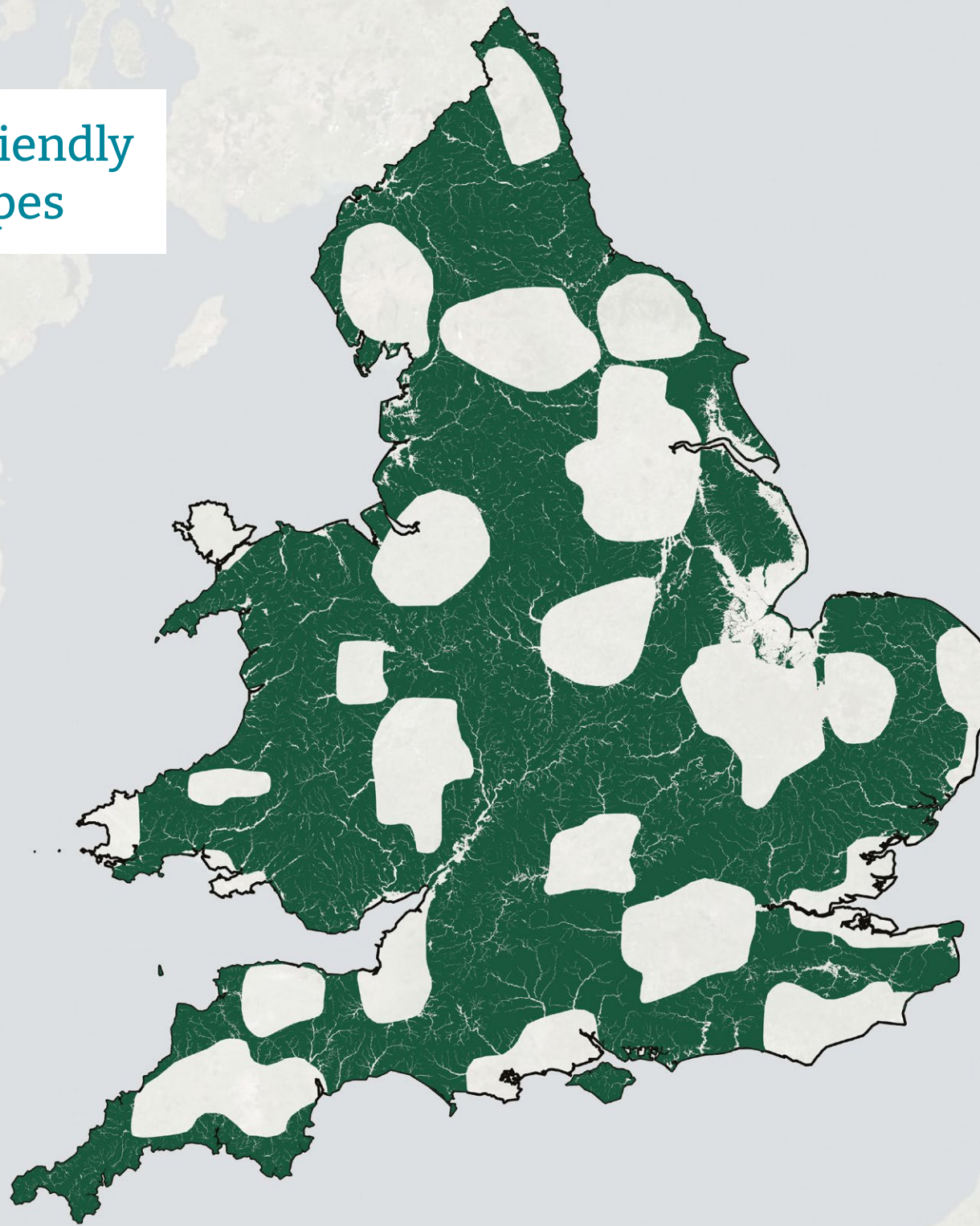
Because of their small catchments, small freshwaters are a particularly important component of Water Friendly Landscapes as they can be better protected from pollution, even in otherwise urban or intensively managed areas. Agri-environment schemes offer incentives for landowners to make less productive land work better for wildlife. Added to this, by restoring and creating small waterbodies in land protected from pollution, we can bring clean water back to our cities, towns and countryside.

In Water Friendly Landscapes we can:

- Create and restore small freshwater habitats to bring back clean water and extend the network of high-quality habitats for freshwater wildlife.
- Reduce pollution inputs and de-intensify the landscape to maximise the extent of clean-water habitats.



Water Friendly Landscapes



Land outside of Important
Freshwater Landscapes
and Historic Floodplain has
the potential to be a Water
Friendly Landscape.

Water Friendly Farming

Focused within a typical commercial farming landscape in Leicestershire, Water Friendly Farming has clearly shown that small waters make the biggest difference in freshwater recovery – short of complete land-use change.

A partnership between Freshwater Habitats Trust, the Environment Agency, University of York, and Game & Wildlife Conservation Trust's Allerton Project, Water Friendly Farming is the UK's longest running and most detailed catchment scale agri-environment research demonstration project. Since 2010, the project team has tested the effectiveness of landscape-wide mitigation measures used to reduce the impact of rural land use on the freshwater environment without affecting the profitability of farm businesses.

Research carried out in the project showed that making clean water ponds increased wetland plant species diversity across the landscape by a striking 26%.⁹ Uncommon species benefitted even more. Pond creation had the single biggest impact of any measure tested, which shows the vital role of ponds in improving the freshwater environment in intensively managed landscapes across the country.





The River Irfon catchment in Mid-Wales is a Special Area of Conservation designated for its exceptional freshwater biodiversity. It supports one of the few remaining Welsh Freshwater Pearl Mussel populations but exposure to multiple pressures means the catchment is failing to meet Habitats Directive and Water Framework Directive targets. Freshwater Habitats Trust is working with local landowners and communities to improve water quality in the catchment.

Footnotes and references

1. In the UK, small waters make up 98% of standing waterbodies (<https://nora.nerc.ac.uk/id/eprint/9622/1/N009622CR.pdf>, <https://catalogue.ceh.ac.uk/documents/12c031cf-322d-42da-bfc5-6cf0aae8ce77>) and 60–70% of the length of running waters (<https://link.springer.com/article/10.1007/s10750-016-3007-0>). Small waterbodies comprise 30% of the total surface area of all freshwaters (<https://link.springer.com/article/10.1007/s10750-016-3007-0>, <https://doi.org/10.5281/zenodo.13844497>)
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10. Freshwater Species of Conservation Concern are plant and animal species which are either rare or declining according to national or international legislation and red lists.
11. Biggs, J., Ewald, N., Nicolet, P., Case, P., Williams, P., Tasker, S. (submitted). *Building the Freshwater Network: a new approach to the identification of freshwater biodiversity hotspots and restoration opportunities in England and Wales*.
12. Williams, P., Whitfield, M., Biggs, J., Bray, S., Fox, G., Nicolet, P., Sear, D. (2004) *Biological Conservation. Comparative biodiversity of rivers, streams, ditches and ponds in an agricultural landscape in Southern England*. Available at <https://www.sciencedirect.com/science/article/abs/pii/S0006320703001538>
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Freshwater Habitats Trust is bringing together a network of partners to build the Freshwater Network.

The Freshwater Network will test new models of funding and organisation, increasing our ability to deliver practically over a larger area for freshwater biodiversity.

Together, we will apply the latest understanding of how freshwater ecosystems work as networks of habitats, ensuring the Freshwater Network is evidence-based and strategic.

Join the Freshwater Network

To achieve a reset for Britain's freshwaters, it is important to focus on the things that really make a difference.

We encourage you to:

- Sign up to the principles of the Freshwater Network.
- Push for policies which support the delivery of the Freshwater Network.
- Integrate the Freshwater Network into your organisational, catchment and local government plans and strategies.
- Collaborate on partnership projects to deliver the Freshwater Network.
- Ensure there are programmes in place to monitor the benefits of the Freshwater Network, assessing both successes and failures.



www.freshwaterhabitats.org.uk

Freshwater Habitats Trust. 2025. 'The Freshwater Network... wilder, wetter, cleaner, connected'. Freshwater Habitats Trust, Oxford.

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