Incorporating small freshwater habitats into your Local Nature Recovery Strategy

Guidance for Responsible Authorities

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About Freshwater Habitats Trust

Freshwater Habitats Trust is a national wildlife conservation charity that has been dedicated to reversing the decline in freshwater biodiversity for more than 35 years. We are known internationally for our scientific research and monitoring, as well as practical conservation and work with policymakers.

Although we work with the whole freshwater environment, our evidence indicates that, to maximise biodiversity benefits, there is a particular need to focus on small freshwater habitats such as ponds, wetlands and streams.

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Summary

This document provides guidance for incorporating small freshwater habitats into Local Nature Recovery Strategies.

This includes ponds, headwater streams, springs, flushes, ditches and small areas of wetland.

Small freshwaters are now known to be critical biodiversity hotspots. Protecting, restoring and creating them is essential to maintain and increase freshwater biodiversity in all regions, across all landscapes.

Knowledge about the vital importance of small freshwaters is relatively recent, and there is a general lack of understanding and confidence about how they should be incorporated into policy.

This document provides support for Responsible Authorities to enable small freshwaters to be better included in Local Nature Recovery Strategies.

This includes guidance on:

- Appropriate targets for small freshwaters that can be immediately incorporated into Local Nature Recovery Strategies.
- Assessment methods that can be used to map and evaluate high quality freshwater habitats so they can be better protected, and built out from.

Step One. Setting priorities for small waterbodies

Local Nature Recovery Strategies provide an important opportunity to drive regional recovery of freshwater biodiversity by establishing targets for small waterbodies.

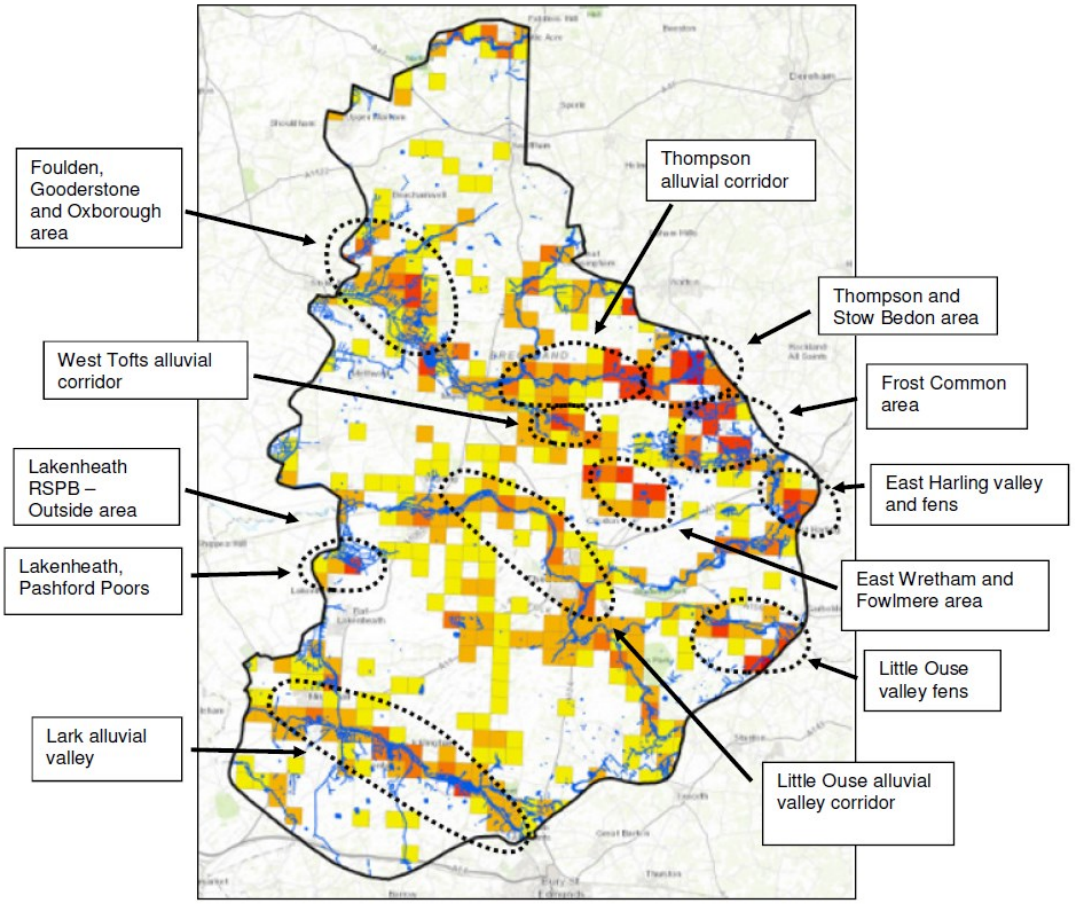
Restoring and creating small freshwaters and wetlands is a fast and cost-effective way to recover freshwater biodiversity within landscapes. It builds connectivity between existing freshwater habitats and provides critical opportunities to bring back truly clean water to landscapes. Appropriate targets are summarised in the table below.

Key priorities for small freshwaters in Local Nature Recovery Strategies. See Tables 2, 3 and 4 for full priorities and measures.	
Ponds	*Double the number of Priority Ponds within the strategy area (through pond creation and restoration).*
Headwater streams, springs, flushes and ditches	*Double the length of Water Framework Directive high-status Priority Headwaters, and other running water habitats.*
Small wetlands (fens, mires, wet grassland, wet woodland)	*Double the area of small wetlands at Favourable Conservation Status, and under favourable management.*
Freshwater Species of Conservation Concern	*Expand the distribution and population size of all freshwater Species of Conservation Concern within the strategy area.*

Step Two. Updated assessment of important freshwater habitats

The historic neglect of small waterbodies means that their value is highly likely to be under-represented in current regional assessments of important freshwater habitats, which have traditionally focused on larger waterbodies, particularly rivers and lakes.

Undertaking an **Important Freshwater Area analysis** enables objective assessment of critically important areas for freshwater biodiversity in a region. These analyses inevitably highlight the importance of small waterbodies, and provide knowledge-based evidence for re-prioritising the protection, restoration and creation of all freshwaters in order to deliver the greatest benefits for freshwater biodiversity.



An example of an Important Freshwater Area analysis, identifying the key areas of the Norfolk and Suffolk Brecks for freshwater biodiversity. The analysis draws on species and habitat data to locate critical freshwater biodiversity hotspots.

Contents

Introduction

This document provides guidance on how to incorporate small freshwater habitats into a Local Nature Recovery Strategy (LNRS).

We have produced this guidance because we are aware of a data and knowledge gap around small freshwater habitats. **This leads to small freshwater habitats being overlooked and undervalued, despite being critically important for freshwater biodiversity**.

The guide:

- Briefly summarises why small waters are important.
- Outlines why small waters are particularly important in helping to deliver National Environmental Objectives for nature and water.
- Provides evidence-based targets for small freshwaters which can be directly incorporated into LNRSs. These targets are based on evidence of their effectiveness, derived from Freshwater Habitats Trust and others' peer-reviewed research and practical work.
- Provides guidance on the Important Freshwater Area analysis process, a key step in identifying priority areas for practical freshwater conservation work in LNRSs.

The value of small freshwaters for nature recovery

Small freshwater habitats include:

- Ponds
- Small lakes (up to 50 ha in area)
- Small areas of wetland (e.g. alkaline headwater fens, transition and basin mires)
- Ditches
- Springs and flushes
- Small streams, including headwater (i.e. 1st to 3rd order) streams.

Small freshwaters are the most numerous components of Britain's water environment. A growing body of scientific evidence also shows that, together, **small freshwaters are critical for supporting regional freshwater biodiversity**.

At landscape scale, for example, ponds have been shown to support a greater proportion of freshwater species (including higher numbers of rare and threatened species) than rivers and lakes. Small running waters are also disproportionately important: as much as 30% of a river's macroinvertebrate diversity can *only* be found in its headwaters.

The biodiversity of small freshwaters is driven by their small catchment size, which has two key effects:

- Small catchments are more likely to entirely consist of semi-natural (or low intensity) land uses, and so be protected from pollution. Many freshwater plants and animals need unpolluted water, so small freshwaters often provide the last remaining refuges for pollution sensitive freshwater plants and animals across large swathes of England.
- Small freshwaters can be strongly affected by very local variations in geology and hydrology – variations which are averaged-out in the larger catchments of lakes and rivers. This means that, collectively, small freshwaters provide a wider range of physical, chemical and biological conditions than larger waters, so can support a wider range of species with specific ecological niches.

The first property – the potential to be pollution-free - gives small freshwaters a 'superpower' for nature recovery. Often, the easiest way to bring clean water back to the landscape is to create new small freshwaters, particularly ponds, that are located within small catchments protected from pollution. Taking this approach, rather than focusing efforts on attempts to reduce the pollution of existing habitats, can bring about rapid recovery at a landscape scale.

Small freshwaters are relatively cheap, quick and easy to create, restore and manage. If they are situated in catchments which produce clean water, they will be rapidly colonised by aquatic plants and animals, including rare and sensitive species which cannot persist in polluted habitats. **Small freshwater creation (and restoration) therefore represents a golden opportunity for Local Nature Recovery Strategies to make a significant difference to regional biodiversity. To bring the rapid and urgent changes needed to protect freshwater wildlife it is vital that LNRSs take full account of these smaller habitats alongside larger rivers and lakes.**

Protecting, creating and restoring small freshwater habitats

Small freshwater habitats have been widely lost from our landscape through urban development, agricultural intensification and drainage. This has particularly affected ponds which, across England, are estimated to have dropped in number by more than 50% since 1880, with commensurate reductions in the range and abundance of many sensitive freshwater species. Fortunately, the small size of ponds makes them relatively easy habitats to create, reversing these historic losses. Crucially, because of their typically small catchments, new ponds can easily be located where they are protected from pollution. New ponds are quickly colonised by wildlife communities similar to those found in much older waterbodies, particularly if created in close proximity to existing high-quality waterbodies.

As well as being lost from the landscape altogether, many remaining small freshwaters have been degraded by mismanagement and pollution. For example, loss of grazing has resulted in widespread scrub and secondary woodland encroachment into farmland ponds and rare fen habitats. Many headwater streams have been subject to damaging channel modification.

Small freshwater creation and restoration reverses this historic degradation and delivers significant benefits to nature. For example, restoration of farmland ponds in Norfolk increased the biomass of emerging insects 25-fold, benefitting declining farmland birds. New clean water pond creation has been shown to increase the variety of freshwater plants in the landscape as a whole by nearly 20% - one of the largest gains so far observed for any freshwater management method. Likewise, the resurrection of 'ghost ponds' can enable the reestablishment of locally extinct aquatic plants from the seed bank, more than a century after infilling. Headwater streams which have been straightened and deepened to drain the land can be re-meandered or simply filled-in (so-called 'Stage 0' restoration) to naturally reconnect with their floodplains.

The creation and restoration of freshwaters in local strategies will only reach its full potential where the water in those habitats is unpolluted. Working with small waters makes this much easier because creation and restoration works can be focused within clean water catchments or areas where land can be de-intensified to supply clean water, maximising the nature recovery benefits.

Actions to address diffuse and point-source pollution within the relatively small catchments of ponds and headwater streams are likely to be more effective than similar actions in larger downstream catchments – where many more pollution sources must be controlled. Actions to create clean water sources could be delivered alone (e.g. converting intensive grassland to low-input systems to reduce headwater stream pollution), or in concert with habitat creation or restoration works.

Step One: Setting priorities for small freshwaters in Local Nature Recovery Strategies

Small freshwaters and wetlands are keystone components of the water environment. It is unlikely that successful freshwater nature recovery can be achieved in any region without recognition of their importance and actions to reverse their loss and degradation.

LNRSs need to consider *all* freshwater habitats, big and small, generally focusing on Habitats of Principal Importance (i.e. 'Priority habitats'), which are most likely to be valuable and/or at risk. Specifically:

- Ponds (note this includes only specifically defined priority ponds, not all ponds)
- Rivers (including headwaters)
- Aquifer-fed naturally fluctuating water bodies
- Eutrophic standing waters
- Mesotrophic lakes
- Oligotrophic and dystrophic lakes
- Blanket bog
- Lowland raised bog
- Purple moor-grass and rush pastures
- Lowland fens
- Reedbeds
- Upland flushes, fens and swamps
- Coastal and floodplain grazing marsh
- Wet woodland

In many regions, especially in the lowlands, **the most rapid benefits for freshwater biodiversity can be gained by particularly focusing on small freshwater habitats.** Setting clear, achievable targets for small waters contributes to multiple National Environmental Objectives (Table 1).

Table 1. Contributions made by small waters to National Environmental Objectives

Objective	Mechanism
ENVIRONMENT ACT 2021	
Biodiversity on land - Restore or create in excess of 500,000 hectares of a range of wildlife-rich habitat outside protected sites by 2042, compared to 2022 levels	Restoring and creating small waters contributes directly to national targets for habitat creation outside protected areas. Methods for creating new high quality small waters, of SSSI standard, are well-understood and can be widely applied in many different kinds of landscape.

Biodiversity on land – Halt the decline of species abundance by 2030. Ensure that species abundance in 2042 is greater than in 2022, and at least 10% greater than 2030	Restoring and creating small waters contributes directly to targets for halting the decline in species abundance. About 70% of freshwater species assessed in the Environment Act 2021 for the species abundance target are found in small waters. Additionally, ponds alone support populations of 10% of all priority species, both terrestrial and aquatic.
Biodiversity on land - Reduce the risk of species' extinction by 2042, compared to the risk of species' extinction in 2022	Small waters are hotspots for uncommon species. Ensuring their quality and increasing their abundance will increase the populations of many Red-listed species. Creating and restoring small waters has the potential to substantially reduce the extinction risk for many freshwater species.
Improve water quality and availability - Reduce nitrogen (N), phosphorus (P) and sediment pollution from agriculture into the water environment by at least 40% by 2038	Creation and restoration of small waters increases water availability at the landscape scale and, when well sited, these waters are of excellent chemical quality. Additionally, small waters can be created within small catchments which are more easily protected from pollution, proportionally reducing the input of N, P and sediment pollution into the water environment.
ENVIRONMENTAL IMPROVEMENT PLAN 2023	
Restore 75% of water bodies to Good ecological status	Small waters are often directly or indirectly hydrologically connected to larger downstream waterbodies, and can act as a source of freshwater species lost from downstream waters, helping these to achieve Good ecological status.
Ensure delivery and management of actions and policies that contribute towards 25 YEP goals and suitable for a changing climate	Setting ambitious targets for landscape-scale small water creation and restoration will improve connectivity of freshwater habitats and increase resilience to climate change.
Make sure LNRSs include proposals for Nature-based Solutions which improve flood risk management where appropriate	Small waters are a proven technology for local water storage. If well-designed they can bring multiple benefits as 'nature-based solutions' including, critically, benefits for biodiversity. LNRSs should emphasise the need for evidence of these multiple benefits when working with small waters and wetlands.

Priorities for small freshwaters

The tables below set out recommended priorities and measures for the three most widespread types of small freshwaters: ponds (Table 2), headwater streams (Table 3) and small wetlands (Table 4).

The targets are based on the evidence-based aims of the national strategy for protecting freshwater biodiversity being developed by Freshwater Habitats Trust and partners.

Table 2. Priorities and measures for Priority Ponds		
HABITAT:		Priority Ponds
PRIORITIES: Targets for nature recovery		• Double the number of Priority Ponds present in the strategy area. • Distribution and population status of freshwater Species of Conservation Concern associated with Priority Ponds stable or increasing.
POTENTIAL MEASURES	Retain and maintain existing good-quality habitats	• Location of Priority Ponds recognised in local plans • Improve awareness of good management practice for Priority Ponds and surrounding land, including appropriate livestock access. • Eliminate or minimise fertiliser and pesticide use within Priority Pond catchments • Create ≥50 m buffers of low intensity land use around Priority Ponds.
	Restore and create new good-quality habitats	• Create and restore ponds which have the potential to become Priority Ponds (including reinstatement of ghost ponds) focusing on areas of low-intensity land use which provide a clean water source. • Create and restore ponds where minimal intervention will be required (e.g. for small field ponds, ensure livestock are present to control vegetation succession). • Create and restore ponds in the habitat matrix of new habitat creation schemes (a good sub-target is for every 100 ha of habitat creation e.g. tree planting, we recommend creating at least 10 new priority ponds).
GEOGRAPHY: Where Priority Ponds should be prioritised		• New ponds can be made almost anywhere that there are impermeable substrates (e.g. clay-rich geology), or permeable substrates with high groundwater levels. • Within and adjacent to Important Freshwater Areas. • For Great Crested Newts, within District Licensing Strategic Opportunity Areas.
SOURCES: Further information and technical guidance		Pond restoration increases insect emergence Pond biodiversity value at a landscape scale Pond creation advice from FHT Pond restoration advice from FHT and UCL Pond management advice from FHT National Priority Pond map IFA analysis for your strategy area: contact us

Table 3. Priorities and measures for headwaters		
HABITAT:		Headwaters
PRIORITIES: Targets for nature recovery		• Double the length of Water Framework Directive High status Priority Headwaters in the strategy area. • Distribution and population size of all freshwater Species of Conservation Concern associated with headwater streams stable or increasing.
POTENTIAL MEASURES	Retain and maintain existing good-quality habitats	• Promote clean water generating land use around high-quality (e.g. Water Framework Directive High status) headwaters by identifying their catchments as priority areas for terrestrial habitat restoration. • Support sensitive management of existing high-quality headwaters, including further deintensifying catchments, aiming for 70% or more low intensity landcover, and eliminating point source pollution. • Eliminate or minimise fertiliser and pesticide use within headwater catchments. • Where catchments cannot be completely deintensified, create ≥50 m buffer of low intensity land use around headwaters.
	Restore and create new habitats	• Extend the network of unpolluted streams by promoting clean water-generating land use **downstream** of high-quality (e.g. Water Framework Directive High status) headwaters. • Identify modified headwaters in clean water catchments, and conduct Stage 0 restoration, or equivalent, to restore natural stream valley morphology.
GEOGRAPHY: Where headwaters should be prioritised		• In and close to Important Freshwater Areas (IFAs). • In areas of low-intensity land use, such as woodland, heathland and unimproved grassland.
SOURCES: Further information and technical guidance		Headwater ecosystem services, threats and restoration. Stage 0 river restoration. IFA analysis for your strategy area: contact us.

Table 4. Priorities and measures for small wetlands		
HABITAT:		Small wetlands (e.g. alkaline valley fens, small basin mires, flushes, wet grassland, wet woodland)
PRIORITIES: Targets for nature recovery		• Double the area of small wetlands at Favourable Conservation Status and under favourable management within the strategy area.
POTENTIAL MEASURES	Retain and maintain existing good-quality habitats	• Understand the location and condition of small wetland habitats in the strategy area – good quality and recently degraded habitat extent is poorly mapped and understood in some counties. • Improve awareness of good management practice for small wetlands, including livestock grazing. • Promote low intensity land use in the catchments of small wetlands, eliminating or minimising fertiliser and pesticide use.
	Restore and create new habitats	• Create or restore small areas of wetland in the habitat matrix provided by existing woodland, heathland or grassland (a good sub-target is 1 ha of wetland habitat per 100 ha of existing terrestrial vegetation). • Re-establish water-dependent wetland habitats on historic floodplains. • Restore small wetlands (e.g. for fens, by reinstatement of grazing or manual scrub and reed management) in areas of low-intensity land use, which provide a clean water source.
GEOGRAPHY: Where small wetlands should be prioritised		• Areas of impermeable, saturated substrate, or permeable substrate with high groundwater tables. • Floodplains • Land adjacent to, or within, Important Freshwater Areas (IFAs).
SOURCES: Further information and technical guidance		Floodplain Meadows Partnership The Fen Management Handbook IFA analysis for your strategy area: contact us

Step Two: Undertaking Important Freshwater Area analysis to prioritise areas for freshwater biodiversity conservation

A key purpose of Local Nature Recovery Strategies is to **'identify locations to create or improve habitat most likely to provide the greatest benefit for nature and the wider environment'**.

The historic neglect of small waterbodies means that, currently, they are unlikely to be adequately mapped and incorporated within regional assessments of important freshwater habitats.

It is important to update current mapping so that it incorporates *all* freshwater habitats. This process inevitably highlights the critical importance of small waterbodies and wetlands. Freshwater Habitats Trust has developed a protocol for this assessment called **Important Freshwater Area analysis**. It aims to look objectively at freshwater biodiversity across all freshwater habitats in order to identify hotspots and key areas at risk.

This analysis provides a knowledge-based reset enabling more effective prioritisation of freshwater protection, restoration and creation within a region. It also enables strategic targeting to support habitat enhancements that build out from high-quality sites to increase freshwater connectivity and make use of land cover types that provide clean water, such as woodland, heathland and semi-natural 'unimproved' grassland.

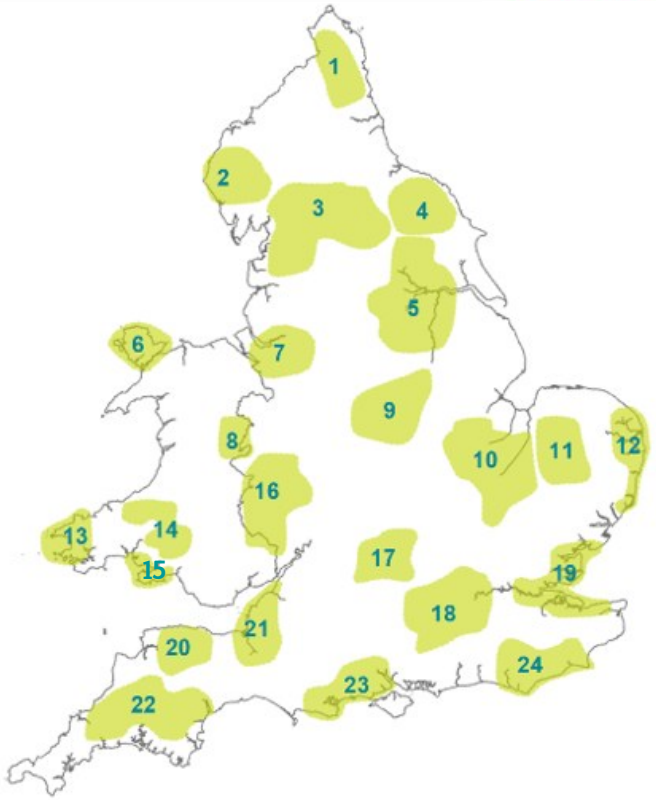
Starting the mapping process

At a national level, Freshwater Habitats Trust has started the process of mapping biodiversity hotspots to produce a map of Important Freshwater Landscapes (Fig. 1). These identify the 24 most important landscapes in England and Wales for freshwater biodiversity.

If an Important Freshwater Landscape falls within your strategy area, this should be a primary locus for freshwater restoration and creation actions, with potential to deliver nationally significant benefits for freshwater nature recovery.

If your strategy area does not overlap with an Important Freshwater Landscape, it will still contain pockets of high-quality freshwater and wetland habitats, Important Freshwater Areas (IFAs) which will be critically important for regional and, in some cases, national biodiversity. Identifying and targeting these areas will greatly increase the benefits of LNRSs for biodiversity in freshwaters.

Figure 1. Nationally Important Freshwater Landscapes (England and Wales)



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

Important Freshwater Area analysis in your strategy area

The aim of Important Freshwater Area analysis is to inform the protection of existing freshwater biodiversity hotspots (many of which are still declining in quality) and help to target actions which maintain, restore and build out from these areas.

The analysis:

- Maps critical areas for freshwater biodiversity and the habitats that support them, using national and regional data on the distribution of freshwater species and habitats, as well as landscape, land use and geology.
- Identifies locations within the strategy area where creation or restoration of freshwaters will deliver the greatest benefits for biodiversity.

Taking this approach, sites containing rare and sensitive species are safeguarded, and can then act as sources of freshwater species when new sites are created and restored. As a result, new sites are much more likely to be colonised by rare, sensitive and slow-dispersing species, and connectivity of freshwater habitats is increased, promoting greater resilience.

An outline of the Important Freshwater Area analysis process is given in Appendix 1. An example for the Brecks area can be found here.

If you would like more information about undertaking Important Freshwater Area analysis in your strategy area, please contact Sam Tasker at STasker@freshwaterhabitats.org.uk

Appendix 1. Important Freshwater Area methodology

Currently, effective action to restore freshwaters is stymied by diffuse and difficult-to-access data on the distribution of important freshwater habitats and species. To overcome these information challenges, Freshwater Habitats Trust has collaborated with national freshwater biology specialists, major landholding organisations and statutory conservation bodies to develop the Important Freshwater Area concept. Important Freshwater Areas are identified by collating national and regional repositories of information on the distribution of freshwater species and habitats, and analysing these data to map freshwater biodiversity hotspots within a region.

The analysis underpinning Important Freshwater Area identification is designed to be transparent and interrogable. In principle, the main steps to identify Important Freshwater Areas are relatively simple. They are:

1. Collect relevant species and habitat data.
2. Collate and verify the datasets.
3. Analyse/map data to identify sites/areas that are of high value for their freshwater species and habitats.
4. Prioritise sites according to constraints and opportunities, and develop plans to protect and build out from these areas.

Data incorporated into Important Freshwater Area analysis come from a variety of sources, including:

- Species data from National Biodiversity Network (NBN), local record centres, the Botanical Society of Britain and Ireland (BSBI) and expert recorders.
- Habitat and site data from UK government departments, agencies and local authorities.
- Supporting information including landscape, land use and geology data from the Centre for Ecology and Hydrology, British Geology Survey and Ordnance Survey.

The criteria for identification of Important Freshwater Areas can vary according to regional context, but typically include:

- Species hotspots, supporting Species of Conservation Concern, and particularly species with a restricted distribution.
- Habitat hotspots, supporting habitats of principal importance such as high-quality chalk rivers, ponds and fens.
- Waterbodies achieving High status for one or more biological quality element (freshwater invertebrates, vascular plants, algae, fish) under the Water Environment (WFD) Regulations.
- Protected sites designated for their freshwater or wetland biodiversity interest (i.e. SSSIs, SACs, RAMSAR wetlands).

Following desk-based analysis of collated regional data, and additional field surveys where necessary, a list of candidate sites is prepared and reviewed with local specialists and organisations. Here, expert experience and local acceptability are formally introduced into the process, before a final selection of Important Freshwater Areas is made.