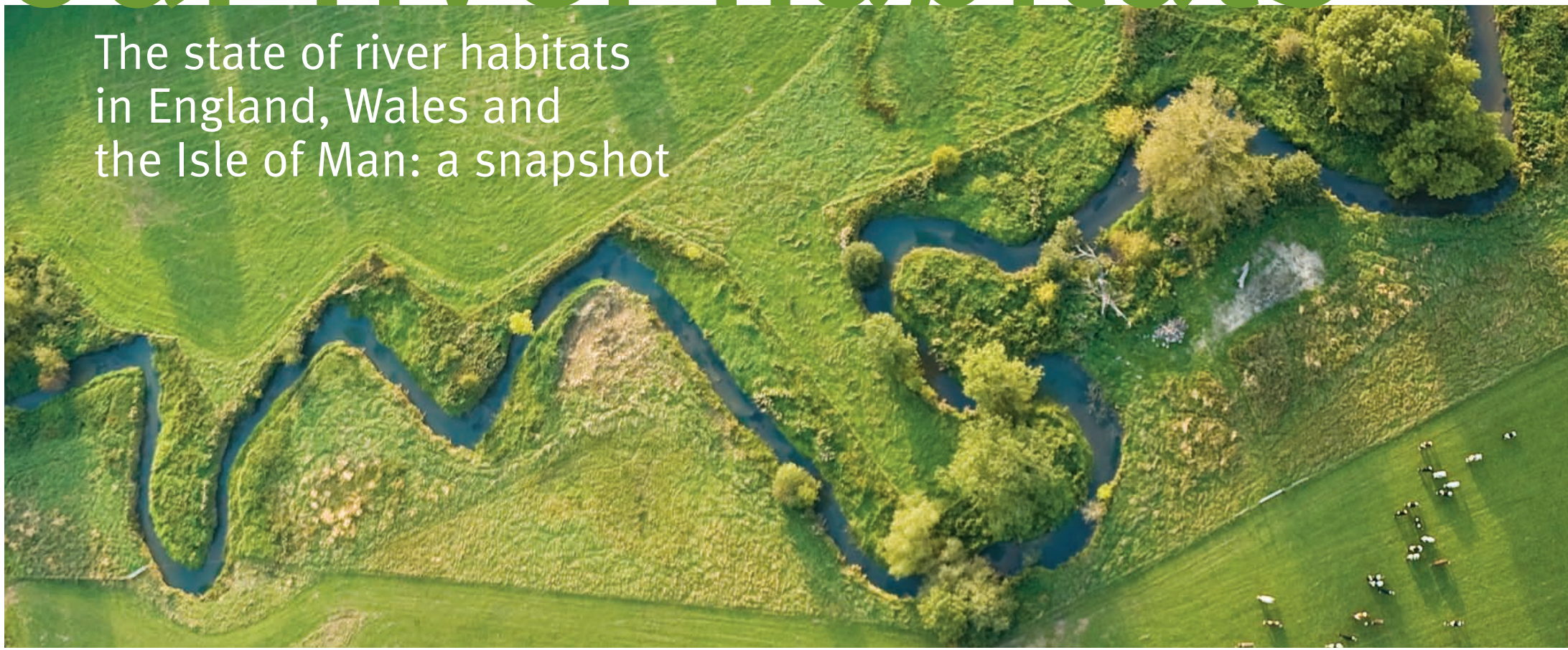
2010 International Year of Biodiversity

Environment Agency

our river habitats

The state of river habitats in England, Wales and the Isle of Man: a snapshot



We are the Environment Agency. It's our job to look after your environment and make it a better place – for you, and for future generations.

Your environment is the air you breathe, the water you drink and the ground you walk on. Working with business, Government and society as a whole, we are making your environment cleaner and healthier.

The Environment Agency. Out there, making your environment a better place.

September 2010

Published by:

Environment Agency
Rio House
Waterside Drive, Aztec West
Almondsbury, Bristol BS32 4UD
Tel: 0870 8506506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

Contents

Headlines

1. River channels are extensively modified across England, Wales and the Isle of Man.

2. Shading of channels is limited by a lack of riverside trees, particularly in some upland landscapes. This increases the risk of water temperature rise caused by climate change.

3. Invasive non-native plants continue to be a feature along many of our river banks, with Himalayan balsam showing an increase in distribution and abundance since 1995-97.

More information

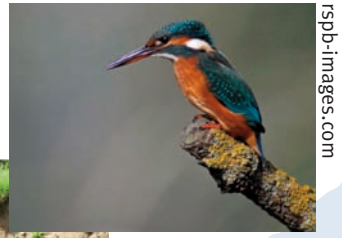
Separate documents for individual River Basin Districts, Wales and the Isle of Man are available, showing facts and figures and information on changes since our last baseline survey in 1995-97.

Why are rivers and their habitats important?

Rivers are essential to our daily lives, providing us not only with water for drinking, industry and crop irrigation, but also with some of our most highly valued landscapes. River networks across the country provide diverse habitats for a variety of water and wetland wildlife.

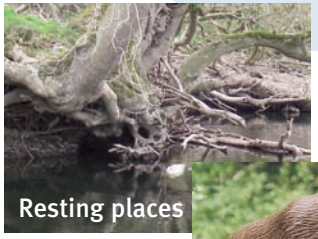
Over many centuries, our rivers have been straightened, widened, deepened and dammed, mainly to improve drainage of land for housing, industry and farmland, and to reduce the risk of local flooding. As a result, river and bankside habitats have become impoverished and the variety of wildlife they support has declined.

Linking wildlife and river habitats



rspb-images.com

Nesting sites



Resting places

Spawning gravels

Chris Ponsford

How do we assess the state of river habitats?

We use River Habitat Survey (RHS), a method which records the diversity of natural features associated with rivers and the physical alterations made to the channel and banks.

We have completed a three-year survey of rivers in England, Wales and the Isle of Man. More than 4,800 sites, 500m in length, were surveyed between May 2006 and September 2008.

This provides us with a comprehensive picture of the present state of river habitats. We can compare the results with our original baseline survey carried out between 1995 and 1997, enabling us to identify changes.

Why is this survey important?

In the past, improving and conserving rivers has often meant focusing on improving water quality.

We now need to take a broader view of the overall ecology of rivers. Habitat is an important part of this, and it is essential that we have reliable information for river management purposes. The results of the 2006-08 survey provide us with authoritative information that represents a major advance in our understanding of rivers. For the first time, this includes headwater streams in England, Wales and Isle of Man.

The information gives us a more complete picture of where both natural features and pressures on rivers occur. This allows us to identify how physical modification might exacerbate factors such as poor water quality or unsustainable water abstraction. We will be better placed to assess the effects of habitat modification on river ecology, what makes rivers more sensitive to a range of pressures, and also to anticipate the consequences of climate change.

We plan to investigate these links further in a series of reports to be published in 2010 and beyond. Readers will be able to see detailed results relevant to their interests and work. We will also be making the baseline dataset available for research projects.

Nigel Holmes

A New Forest stream

Who will use the results?

Users might include:

- A river basin planner who needs to see the big picture
- A flood risk engineer wanting to minimise the impacts of channel modification
- A water resources manager concerned about the combined effects of modification and abstraction on wildlife
- A fisheries scientist concerned about the decline of certain fish species
- An academic researcher interested in river ecology and morphology
- A developer needing to carry out an Environmental Impact Assessment
- Angling and conservation bodies wanting to improve their local rivers
- Schools and other organisations helping people to learn about rivers
- Local planning authorities exploring the natural character of an area and looking for options to protect or restore it.

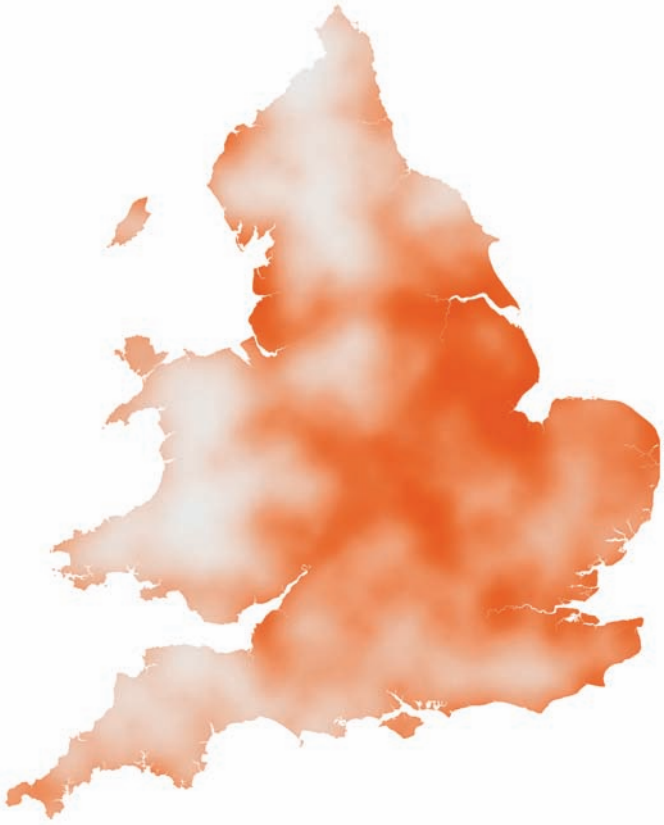
The maps on the following pages provide examples of some of the modifications and features recorded between 2006 and 2008

Channel modification

Changing the shape of the channel can damage the ecology of streams and rivers. One of the consequences is that wildlife along rivers is likely to be less able to adapt to new pressures.

This map shows the extent and severity of channel modifications based on 4,884 sites. Although this sample is only a small percentage of overall stream length, our sampling strategy was designed to provide a representative picture of streams and rivers.

Not surprisingly, the most natural channels are mainly in the uplands. The most heavily-modified channels are found in or near larger cities, or in lowland fens which have extensive drainage systems.



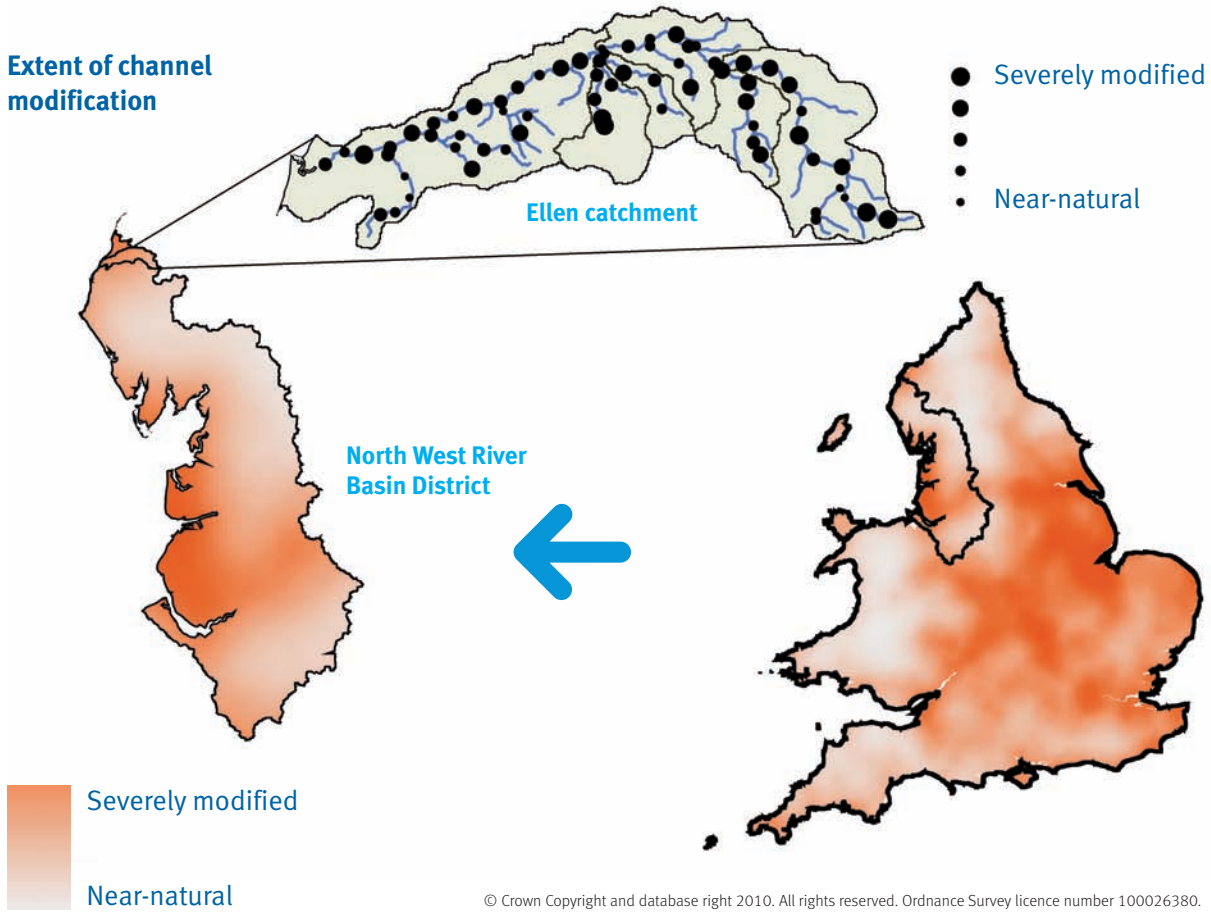
Example of a severely modified channel

A near-natural upland channel with a variety of habitats

At a regional scale, the pattern of modification reflects local influences. The maps below show how RHS data can be used at different scales.

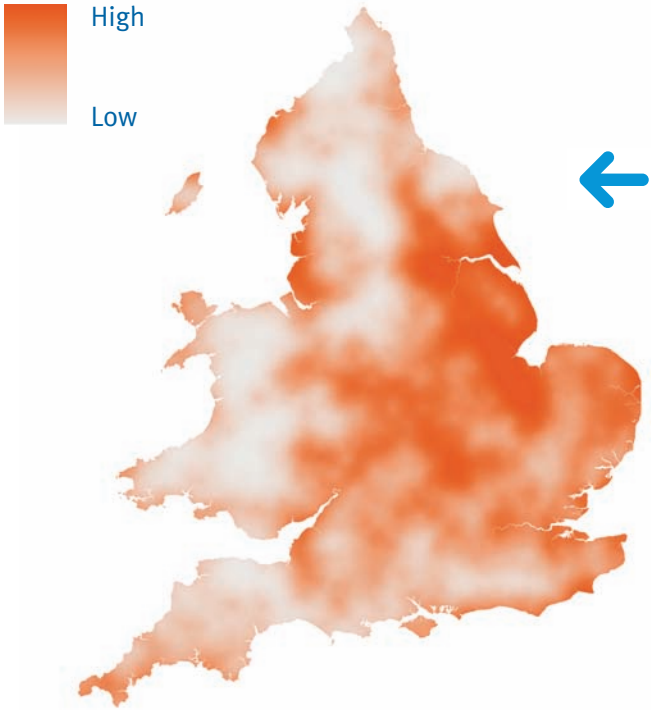
For example, the national picture can be enlarged to show the North West River Basin District. More detail for the Ellen catchment (in Cumbria) is shown using all RHS data collected since 1994, in addition to the 2006-08 data.

This information can help us decide where to protect and improve habitats, taking account of water quality, water abstraction, sites of wildlife interest and enjoyment by local people.



We can also show the extent of different types of alteration revealed by our survey in 2006-08, for example: **a** channel resectioning (deepening, straightening or widening of the channel) and **b** bank reinforcement.

a) Extent of resectioning

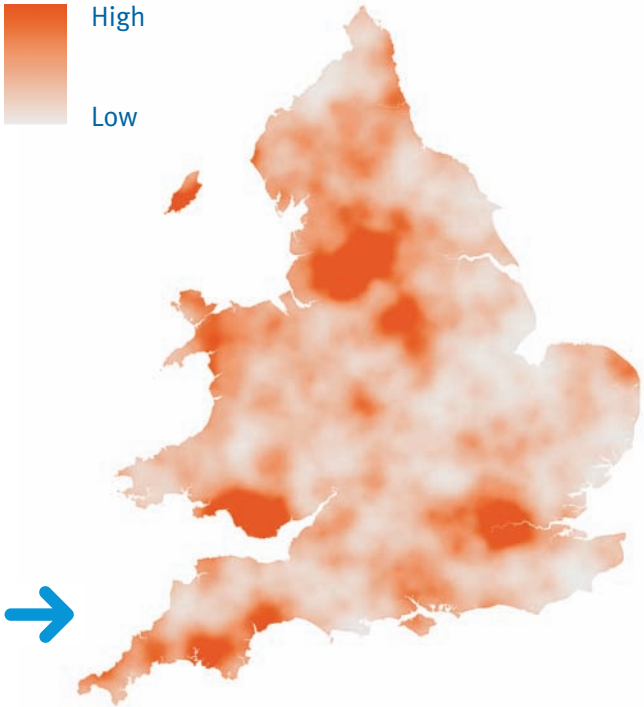


Straightened, deepened channels with smooth, angled banks are largely associated with drainage and flood defence. Almost 43 per cent of river length is resectioned.

Nigel Holmes

River banks with concrete, brick or other hard protection are largely associated with towns and cities or the protection of major roads and railways. Almost eight per cent of river length is reinforced in some way.

b) Extent of reinforcement



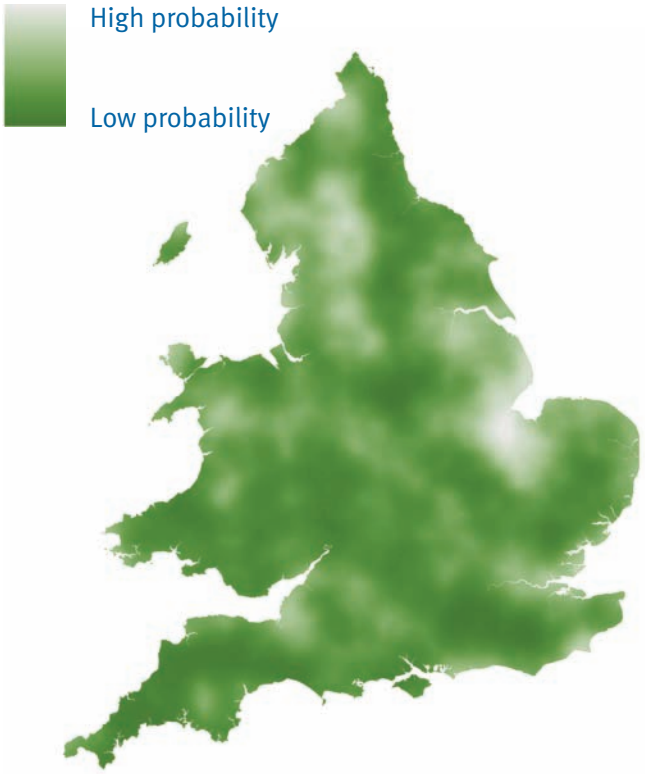
Riverside trees

Riverside trees are important as they provide shade and shelter for wildlife. They can also help to stabilise banks and reduce the effects of sediment run-off from surrounding land.

Climate change is causing water temperatures to rise in some rivers, particularly in upland areas. The absence of tree shade can increase the risk of further temperature rise. Salmon and trout are under threat in places, whilst some aquatic insects such as damselflies are already changing their distribution in response to warmer water temperatures.

Assessing how prone river systems might be to rising temperatures can help us prepare for climate change. We can use the distribution of riverside trees as a simple indicator to identify stretches of river where increasing shade might help to reduce the effects of warmer temperatures. This map shows the general pattern of riverside trees and highlights where they are likely to be sparse or absent. Further work is needed to refine this analysis and to include the latest predictions for changes in water temperature.

Absence of riverside trees



Nigel Holmes

An unshaded, upland stream

Nigel Holmes

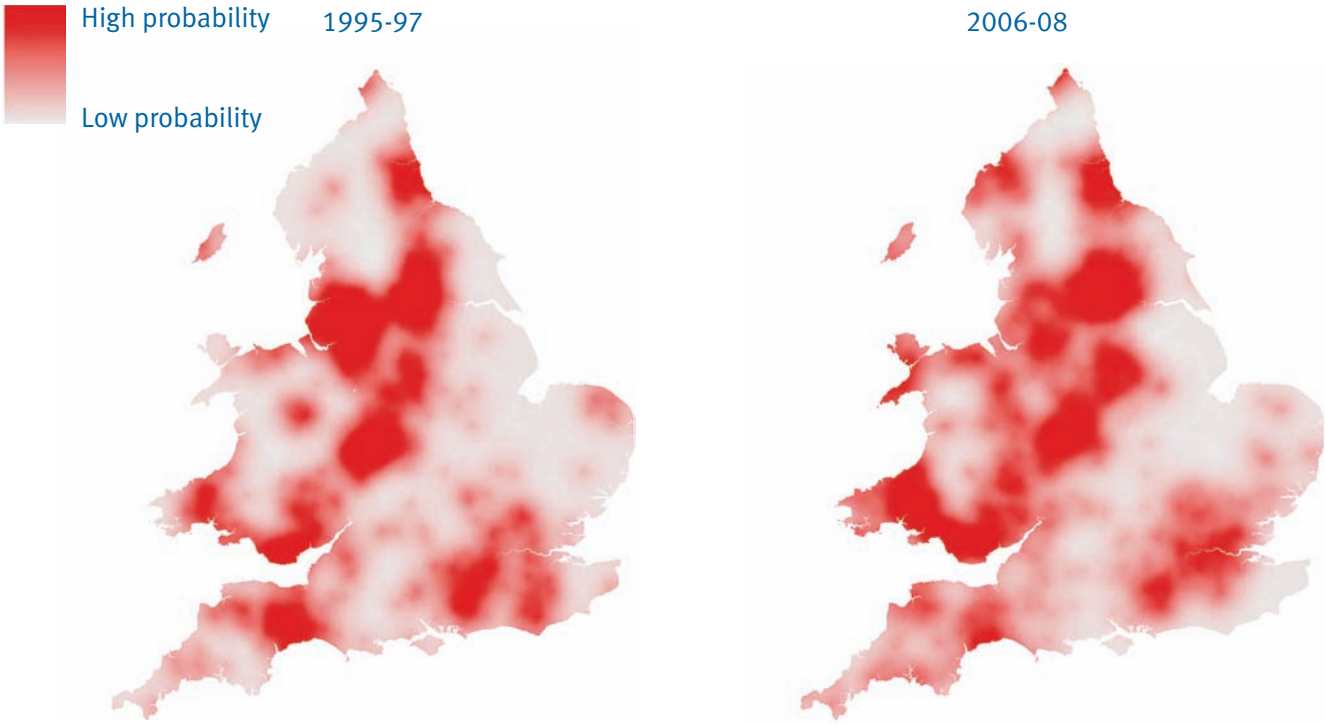
Riverside trees along a lowland river

Invasive non-native plants on river banks

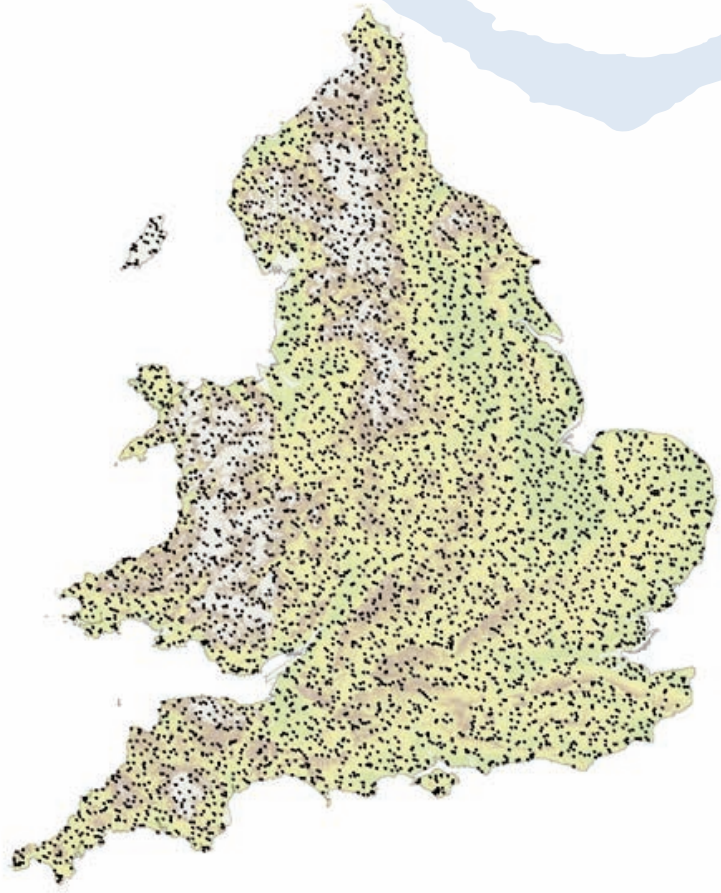
Several invasive, non-native plant species are well established along many of our rivers. Some of them represent a threat to river habitats and their wildlife.

One example is Himalayan (or Indian) balsam (*Impatiens glandulifera*). This colourful non-native species grows from seed in dense patches and suppresses the growth of native plants. In the winter it dies, providing little shelter and food for over-wintering wildlife and leaving bare river banks more susceptible to erosion.

Presence of Himalayan balsam along rivers



Himalayan balsam is spreading along streams and rivers. It is important to note that absence from a survey site does not necessarily indicate absence from other parts of a river.



Distribution of baseline sites, 2006-08.

River Habitat Survey facts

- Over 24,000 surveys on the RHS database
- 4,884 surveys completed for the 2006-08 baseline
- Over 200 trained and accredited RHS surveyors

Making links between RHS and other datasets

- 6,000 biological water quality sites
- 760 flow gauging stations
- 2,000 fisheries survey sites

Applications and future work

We plan to produce a series of practical applications using the data. These will focus on activities such as flood and coastal risk management, water resources, river basin planning, climate change adaptation, ecological monitoring and river management for fisheries and wildlife purposes.

We also plan to make the baseline dataset available for educational and research purposes.

Would you like to find out more about us, or about your environment?

Then call us on 08708 506 506 (Mon-Fri 8-6)

Approximate call costs: 8p plus 6p per minute (standard landline).
Please note charges will vary across telephone providers

email enquiries@environment-agency.gov.uk

or visit our website www.environment-agency.gov.uk

incident hotline 0800 80 70 60 (24hrs)

floodline 0845 988 1188

GEHO0310BRTM-E-E