



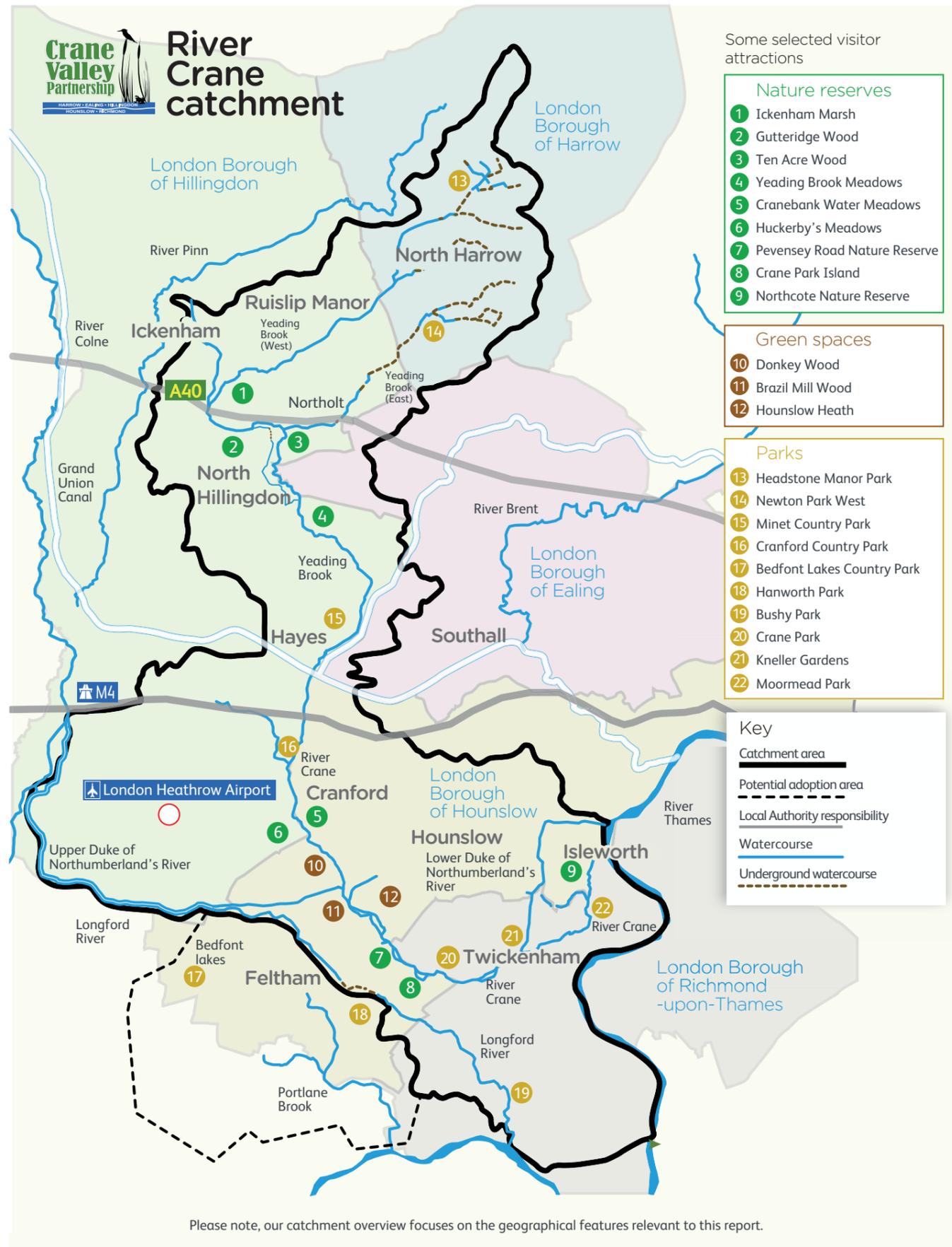
State of the Environment

River Crane Smarter Water
Catchment Programme

Working in partnership

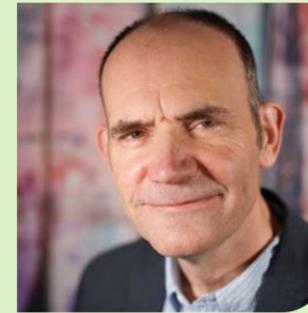


October 2022



This document has been created for the purposes of Thames Water's Smarter Water Catchment programme. Although Thames Water remain the primary client, the document will be made available to all partners, in line with the true partnership ethos of the programme. The work detailed in this report is based on the information available at the time. Any findings and/or recommendations will inform future phases of work. It does not make any observations or recommendations regarding the delivery of statutory obligations by the Environment Agency, Thames Water, Local Authorities, the Highways Authority, and others.

Foreword



John Waxman
 Development Manager,
 Crane Valley Partnership

“ The publication of this State of the Environment Report for the River Crane catchment is a landmark moment for everyone involved in the protection and enhancement of rivers and nearby open spaces in the Crane Valley. For the first time we have a comprehensive picture of the health of the river system and the significant challenges we face in our efforts to ensure that it can deliver the full range of ‘ecosystem services’ that will meet the needs of people and wildlife in a bustling urban context.

The report doesn't pull any punches, shining a light on matters of significant concern that must be addressed, but it doesn't paint a bleak picture either. Indeed, there are many reasons to be optimistic. Solutions are at hand for many of the challenges we face - all that is needed is the collective will to act and to do so in a coordinated way that maximises the chances of making progress.

The Crane Valley Partnership (CVP) was established to provide that co-ordination and has had many successes to date, helping to deliver a range of enhancements on the ground and championing the cause of integrated catchment management across the five west London Boroughs that together make up the Crane Valley.

CVP is particularly keen to ensure that local people have as many opportunities as possible to participate in community stewardship activities or ‘citizen science’ work and can also take advantage of the many health and recreational benefits that access to riverside open space provides. As the public's connection with (and appreciation of) the Crane river system gets stronger, so the imperative for policy makers and other relevant actors to address issues of concern, such as water pollution or habitat degradation, gets stronger.

Hopefully, this State of the Environment Report will serve as an important reference for everyone in a position to make a positive difference.



The CVP, Thames Water and all our partners wholeheartedly welcome your help and views. Contact us by emailing: partnerships@thameswater.co.uk.

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Executive summary

The Crane Valley Partnership has invested several million pounds over the last 15 years and started to make a really positive difference in parts of the catchment. This document reports on the State of the Crane Environment after two years of the Smarter Water Catchment (SWC) programme, an approach piloted by Thames Water seeking to deliver a step change in holistic catchment management.

Further reports will be put together and made available after five and ten years to assess how things have changed using this important report as our baseline for comparison.

The SWC programme has identified the following five key themes to be addressed:



Locally based organisations are helping to lead each of these themes. The main findings for each theme are set out below.

① Promote public awareness, access and participation

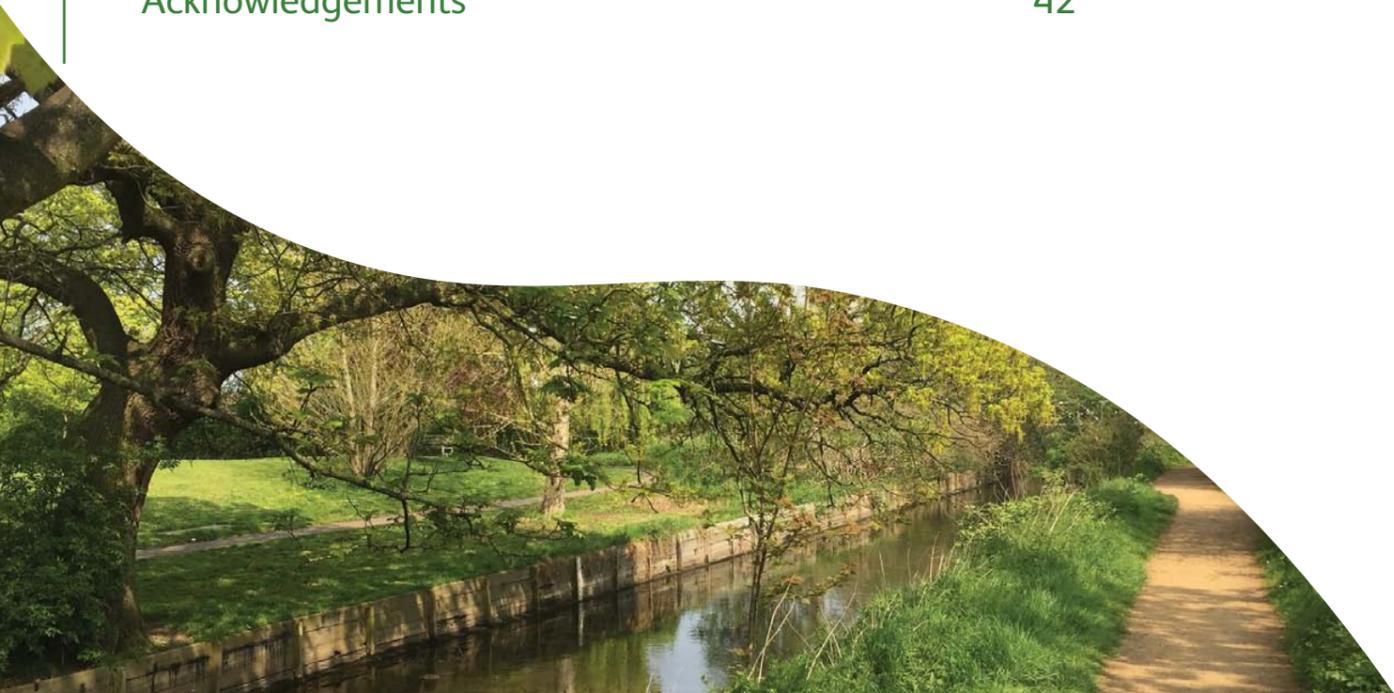
A total of 60 catchment-based community organisations have been identified with an active interest in one or more of the key themes and around 1,000 volunteers operate in the catchment and provide some form of community custodianship over large parts of it.

These organisations often work in isolation in their own open spaces and aren't well linked together. For example there are several parts of the catchment that have no active community engagement.

Access along the river corridors varies enormously and there are significant barriers to pathways, preventing some people from accessing or moving along the river corridor.

Over the next few years the SWC programme will:

- Publicise the opportunities for community engagement and link different groups together
- Deliver The Crane Community Fund which supports small scale community activities with grants of up to £2,000 each
- Develop the capacity of 'Citizen Science' to support all parts of the programme.
- Work with each local authority to identify opportunities to improve access and help co-ordinate and deliver these
- Support the development of a Crane Valley Trail, seeking to provide a high quality accessible walk along the full 35km length of the main river from the source in Harrow to the Thames



2 Enhance flood resilience

The catchment is at risk from flooding from river flows (fluvial flooding), surface water, sewer discharges, and groundwater ingress.

There are particular risks of river flooding in the northern part of the catchment around Harrow.

Much of the river corridor is open space and this is hugely important in limiting fluvial flood risk to the surrounding urban development.

The programme has already supported the creation of a major new wetland at Headstone Manor in Harrow, and a raingarden in Pinkwells Estate in Hillingdon.

The programme has identified over 20 wetlands and sustainable drainage schemes across the catchment. These are currently in various stages of development.

Over the next few years the SWC programme will:

- Monitor existing wetlands and other flood protection schemes to better understand their wider value against the other key themes
- Support schemes that provide benefit for flooding and/or multiple benefits across the catchment. Financial contributions could range from small grants to larger investments of several hundred thousand pounds
- Promote community based schemes such as water butts and rain gardens which have a significant cumulative benefit in reducing flood risk

3 Improve water quality

The upstream tributaries of the river around Harrow have the poorest water quality, failing against current environmental quality standards. Here water quality has been getting significantly worse over the last 20 years.

The river condition improves downstream and is better at the bottom of the main river around Twickenham. This shows the river is capable of cleansing itself.

Monitoring by this programme, using real-time water quality monitoring sondes, has identified major pollution pulses coming into the river, that are likely to be caused by cross-connections from the sewerage system into the river.

Over the next few years the SWC programme will:

- Continue to work with Thames Water to better understand and remove chronic pollution sources
- Encourage the reporting of pollution incidents by the public – there are already ten or more incidents reported every year and early reporting greatly reduces the damage they cause
- Seek to deliver solutions to major road related pollution problems (eg the M4 and A312) in co-ordination with the Highways Authorities (National Highways and Local Authorities)
- Financially support the creation of new wetlands and river restoration schemes that help to intercept and counteract pollution problems. Contributions could range from small grants to larger investments of several hundred thousand pounds

4 Improve geomorphology – the river form

Large parts of the river have been heavily modified by straightening, widening and deepening. A review of old maps indicates that much of this was done over 100 years ago.

Some parts of the river remain in a semi-natural state, whilst some are starting to recover naturally. Other parts have benefited from river restoration schemes to re-naturalise the banks supported by CVP over the last 15 years. But much of the river system remains in an unnatural state and doesn't function properly as a biodiverse ecosystem.

Over the next few years the SWC programme will:

- Support river restoration schemes, particularly where these can provide multiple benefits – to enhance biodiversity, improve water quality, provide a better public realm and/or reduce flood risk
- Monitor river restoration works so as to optimise these benefits
- Train local volunteers as long term wardens for the river

5 Enhance biodiversity – wildlife and their habitats

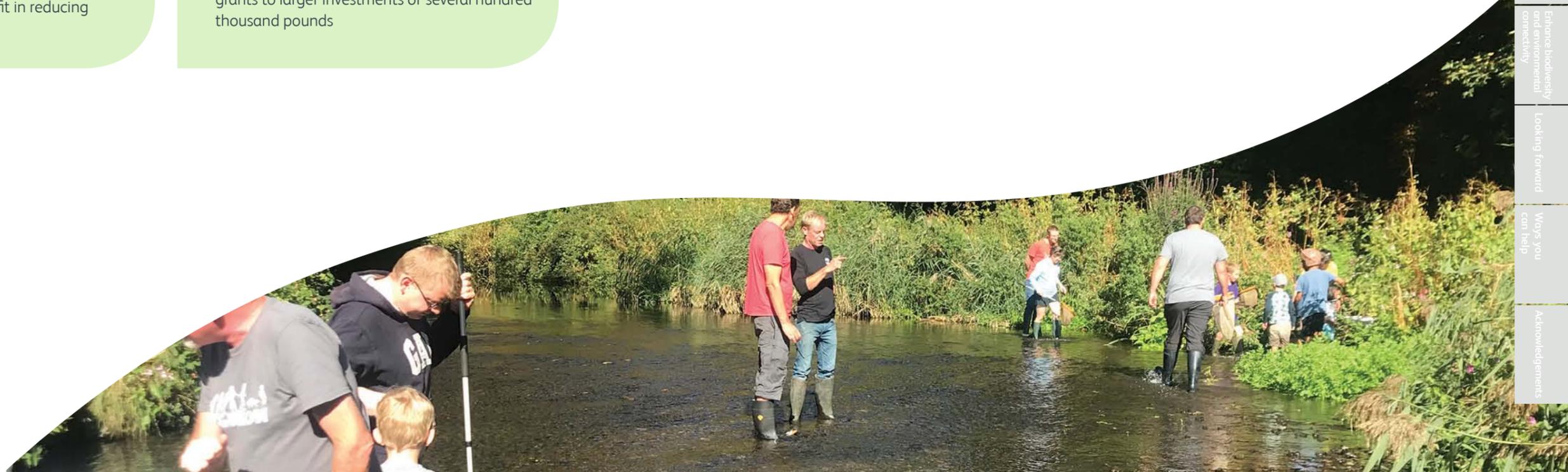
The main river corridors are largely unbroken, and this provides an important network of biodiverse habitats for urban west London.

These habitats support a number of key species and include:

- One of the only remaining water vole colonies in Greater London
- An important refuge for adders on Hounslow Heath
- A good population of kingfishers through most of the river corridor
- Up to seven species of bats use large parts of the corridor
- Breeding populations of a variety of fish
- Eels that are now returning to the catchment for the first time in many years, after new eel passes were put in seven years ago

Over the next few years the SWC programme will:

- Work with local volunteers to monitor key species
- Invest in high quality habitat and creating a better linked network
- Help expand and protect water vole colonies across the catchment
- Remove more in-stream barriers to fish and eel movement



Introduction

The Smarter Water Catchment approach is being piloted by Thames Water as a collaborative way of addressing the challenges and opportunities of rivers and their associated open spaces with all the key stakeholders. The River Crane is the first urban river system in the Thames Region to be considered in this way.

The Crane Valley Partnership (CVP) was set up in 2005 as a way for all the parties interested in the river and its open spaces to work together. As outlined in our catchment map on Page 2, the River Crane catchment covers parts of five west London boroughs (Harrow, Ealing, Hillingdon, Hounslow and Richmond) and these are all members of the partnership, along with Heathrow, Thames Water, The Environment Agency and many community-based groups.

The Crane Valley Community Interest Company (Crane Valley CIC) was set up in 2020 as the new host for the Crane Valley Partnership. Its main purpose is

to provide stronger links between the main Partners and the wider public.

Thames Water has secured £3m in the period of 2020-2025 to deliver this 10-year Catchment Plan. They are working with their regulators through the Price Review process to secure additional funding for future planning cycles. Research by the SWC programme has identified a further £12m of funding held by CVP partners to help enhance the river and its open spaces. One of the key tasks of the SWC programme is to optimise the benefits of these and other funds.

The combined work of the partnership, local community stewardship groups and other stakeholders, has already made significant progress towards returning the river system to a more natural state and enhancing the adjacent open spaces. This first State of the Environment Report (SOE) outlines the current situation, highlighting where further efforts are needed to address the challenges and identifying where all local interested parties can get involved. Further reports will be produced over the next eight years to track progress against these baselines.

The overall aim is to create a coherent and high value blue and green corridor through west London. This transformation will be delivered by the co-creative engagement of all interested parties and the wider public over the next eight years to March 2030.

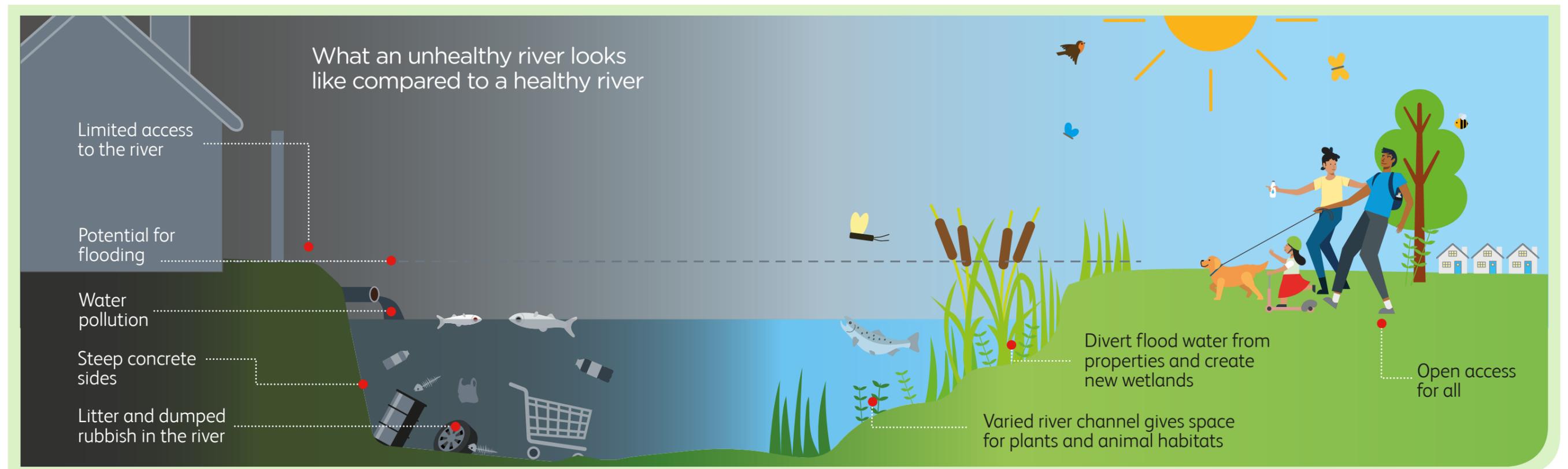
Teams of skilled and locally based organisations have been recruited to address each of the five key SWC themes:

- Promote public awareness, access, and participation
- Enhance flood resilience
- Improve water quality
- Improve geomorphology – the river form
- Enhance biodiversity – wildlife and their habitats

A series of reports, published last year, set out the baseline conditions in detail. For further information see page 43.

The SOE report will be of interest to a wide variety of audiences. But we hope it will be particularly useful to decision-makers who are in a position to support and supercharge efforts to deliver the CVP's collective vision for the catchment. We also hope that the report will inspire more members of the public to participate in community stewardship activities that make a transformative difference on the ground in their local neighbourhoods. In effect this SOE is a galvanising 'call to action' - highlighting the challenges that need to be overcome to bring about positive change for the benefit of everyone living in the Crane Valley.

Whilst some parts of the River Crane are already healthy, much of it is unhealthy. The figure below illustrates the difference between an unhealthy river on the left and an improved, healthy river on the right. The unhealthy river suffers from water pollution. Its steep flat sides and bed create an artificial environment that is inhospitable to wildlife. Flood waters are trapped within the channel rather than spreading onto the floodplain. Limited access encourages anti-social behaviour and littering. By contrast the healthy river is unpolluted by spills from sewers and roads. Natural river banks and beds support diverse and abundant wildlife. The channel and floodplain are connected by wetlands which slow and store flood waters during high flows. The river is accessible to all. Local communities are enjoying the river and help to look after it. The following sections outline our understanding of the current state of the River Crane and set out our plans for improving its health.



The Crane Valley

The Crane Valley covers around 125 km² and extends across five west London Boroughs. It is home to over 650,000 people and includes areas of real affluence and social deprivation. Several major roads and mainline railways traverse the valley. Most of London Heathrow - Europe's busiest airport - lies within the catchment. Much of the land area in the Crane Valley is given over to residential and commercial properties and significant development activity is either ongoing or planned. Even though it's an urban setting, the semi-natural river corridors of the valley act as unifying green threads, linking an extensive and varied network of publicly accessible open spaces.

The river corridors of the Crane Valley extend for around 65 km across this urban landscape and link over 2,000 hectares of public open space, much of it high value, providing a wide range of benefits for both people and wildlife. Their value was first recognised almost a century ago by Middlesex County Council, in the West Middlesex Plan, which incorporated much of the river system into 'The West London Green Chain'. Large parts of this green chain remain intact, some parts in good condition whilst others are significantly degraded.

The Crane Valley is, in many ways, typical of an urban catchment. Over the years, much of the river length has been straightened, often accompanied by widening, burying underground in culverts, and bank reinforcement. This reduced flood risk and allowed local development but also had a negative impact on the attractiveness and habitat of the river corridor. Engineering works have disconnected the river from its natural floodplain in some places and created barriers to fish movement. The huge

amount of hardstanding areas and artificial drainage systems (combined with largely clay soils) means that rainfall generally reaches the river channels quickly, leading to sudden rises in water levels in response to heavy rainfall and a vulnerability to drought conditions.

Unusually for an urban river, there are no municipal sewage works discharges. Mogden Sewage Treatment Works - one of Europe's largest - is located in the lower Crane catchment but discharges directly to the River Thames. Sewage pollution from misconnections and foul sewer overflows is still a major issue in the Crane catchment, impacting water quality and biodiversity.

The Crane is a catchment of contrasts. There are open areas with a countryside feel, and leafy suburbs too, whilst there are also many stretches where the environment is far less attractive. In some places the watercourses are difficult or impossible to access, hidden by dense vegetation, squeezed between rows of houses or buried in culverts underground. There can be an air of neglect, with littering and fly-tipping along riverbanks and adjacent pathways. Despite all this, it's still a valuable habitat for wildlife and key species, including kingfishers, water voles, eels and seven types of bat.

Public awareness, access and participation

The current status

This theme considers the communities living in the Crane catchment and how they access and use the open spaces. The overall aims are to:

- Increase the appreciation of these river corridors by local communities and policy makers
- Place every river corridor and open space under some form of community stewardship
- Create an unbroken Crane Valley Trail with visitor facilities at regular intervals
- Establish public use of all the corridors and open spaces for recreation and health/wellbeing
- Prevent littering, fly-tipping and other forms of anti-social behaviour that reduce the amenity value of the river corridors

In 2022, around 1,000 volunteers were actively engaged in helping to deliver activities, including conservation volunteering. This represents an enormous body of volunteers working on open spaces in the River Crane Catchment on a regular basis. A total of 60 Community Stewardship organisations were identified as outlined in Figure 1.2.



Figure 1.1: Volunteers from Cranford Action Group collecting litter and fly-tipped material in Avenue Park, Cranford, as part of the Restoring the Riverside project.

Community engagement

Research this year considered the strength of community engagement within the catchment and where the gaps are in the geographical coverage by community organisations, alongside recommendations to strengthen local involvement.



Figure 1.2: Types of Community Stewardship organisations in the Crane catchment.

The different activities that 25 community groups are involved in across the catchment are shown in Table 1.

Table 1: Results of interview survey about community group activities.

Activity	Percentage of groups engaged in activity (%)
Conservation volunteering	83
Promoting community and third-party engagement	76
Enhancing green space habitat	71
Promoting health and well being	68
Improving public access	65
Reducing water pollution	56
Protecting heritage	50
Working in partnership	50
Reducing carbon footprint	47
Enhancing river habitat	38
Reducing flood risk	38
Delivering economic benefits	26

Despite this large representation there are still several ‘orphan’ stretches with no community stewardship. These include Yeading Brook East, the Upper Duke of Northumberland’s River and the Longford River upstream from Hanworth Park. Many other areas only have occasional community engagement.

Access to the river corridors

It’s possible for some people to walk, cycle and wheel along much of the river corridor. But there are areas where access isn’t possible and breaks in the continuity of the corridor (especially to the riverside).

The quality of access varies - many spaces are inaccessible to people with protected characteristics, for example those using mobility aids, with buggies, or the elderly.

Together, both sides of the river provide over 100km of frontage. At present only 11km of this is readily available to the public as sealed and fully accessible pathway. In total, there are more than 60km of pathways and their condition varies as detailed on page 13.

Path conditions along the corridor and between the corridor and access points



28% sealed paths

A section of sealed access path at Brookside open space. This hard, sealed surface is accessible to all people walking, cycling and wheeling.



35% made, unsealed paths

A section of made, unsealed corridor path at Avenue Park. This type of path of path is accessible to some users, but not all.



36% unmade paths

A section of unmade corridor path at Hounslow Heath. This type of path is inaccessible to many users.

There are a significant number of barriers to the river corridor where there is no through access from one section to another.

Of the 200 access points to the river corridor, less than 10% are accessible to all users - barrier free, level surface and good width.

More than 36km of river frontage has no access at all and an additional 5km has no ‘through’ access so can’t be travelled effectively, due to culverting, private property and severance by the major road and rail network.

There are also examples of best practice, such as the access along both sides of Crane Park in the London Boroughs of Hounslow and Richmond. Long term public survey data show that these corridors have 10 to 50 times the footfall of poorly served corridors.

Enhancements to the Lower Duke of Northumberland’s River corridor access route from 2016 were shown to increase usage numbers from several dozen to several hundred people a day.



Figure 1.3: Example of good access point (left, at Yeading Walk) and a poor access point (right, at Yeading Brook Meadows).

Why things are like this

Community engagement

Several barriers and challenges were identified to building the capacity of groups working in the catchment:

 <p>Geography</p> <p>Geographical gaps in groups along the catchment coinciding with major roads, Heathrow Airport, and industrial estates.</p>	 <p>Funding and resource</p> <p>Lack of easy access to funding and the complexity of grant applications - the process can often be difficult and time consuming for groups made up of volunteers who have full time jobs and/or little experience.</p>	 <p>Communication</p> <p>Lack of a wider network to communicate with other groups in the catchment leading to limited understanding of catchment wide issues as well as minimal knowledge sharing.</p>
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Access to river corridors

A number of factors were identified as contributing to the current situation:



Yeading Brook underneath the A40 road bridge

Parts of the river have been culverted or bound in a concrete channel - particularly parts of the Yeading Brook in Harrow and the Lower Crane in and around Twickenham.



A barrier to continuous movement along the river pathway posed by the A30 - requires a 1km detour to get around

Cross-cutting roads and railways are barriers to easy, continuous movement of people walking, cycling and wheeling along the river corridor.



The Duke of Northumberland and Longford rivers run alongside Heathrow Airport

Extensive areas of industry and commercial property make it difficult to access some parts of the river, for example around Heathrow Airport.



An access control barrier along the river pathway in Hounslow

Physical barriers have been placed at access points to prevent people using the river corridor on motorbikes. These kinds of barriers also prevent legitimate users (cyclists, wheelchairs and pushchairs) from accessing the space.

How can we make things better?

Community engagement and awareness

A public engagement strategy (PES) is being developed to ensure the River Crane Smarter Water Catchment programme is understood and valued by a wide range of community, business and professional stakeholders.

The PES will establish a network of local people and organisations working collaboratively to meet common aims. Other engagement work will seek to address the opportunities and challenges identified below:

 <p>SWC Community fund</p> <p>Small grants, up to £2K made available for capacity building of community groups, from June 2022.</p>	 <p>SWC Large projects fund</p> <p>Large grants up to £100K for projects delivering benefits across multiple themes, available from June 2022.</p>
 <p>Supporting capacity building</p> <p>Help to existing groups with targeted advice, strategies, and toolkits. Regular meetings for all Crane groups (first in May 2022). CVP newsletter for information sharing between groups (issue 1 in June 2022). Calendar that lists all community events – from late 2022.</p>	 <p>Incubating new groups</p> <p>Fostering community environmental stewardship in the gaps identified – through engagement work and small project initiatives allied to small grant support for prospective groups.</p>

Using annual campaign themes, we will gather work strands in a focused way as follows:

<p>2022/3</p> <p>Connecting with the catchment</p> <p>The importance of improved catchment management for all.</p>	<p>2023/4</p> <p>An active and healthy river corridor</p> <p>Health and Wellbeing of people and the catchment. Workstreams: getting involved in volunteering and citizen science, active travel, mental health, mitigating health risks.</p>	<p>2024/5</p> <p>Nature-rich landscape within easy reach</p> <p>Nature recovery and biodiversity: the catchment thrives through improved management.</p>	<p>2025/6</p> <p>A resilient river corridor</p> <p>Climate adaptation, the river as an indicator, and ways for communities to get involved.</p>
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The Crane Valley CIC is the host organisation for CVP and was set up specifically to provide a communication link between the partners and the wider community. This means it can support all the initiatives developed

by the Smarter Water Catchment programme to create a stronger community and promote co-operation throughout the catchment.

Access to and along the river corridors

Sustrans has completed an access audit of the Crane Valley, creating a geodatabase of the existing access conditions along the river corridor (further information on accessing background reports can be found on page 43).

Using a combination of these data and local expertise, we'll produce a River Access Improvement Plan to identify and prioritise solutions which enable local people to use the river corridor for walking, wheeling, exercising, socialising and play.

Key themes for improving river catchment accessibility include:



Infrastructure

A River Access Improvement Plan is being developed. This will enable policy and decision makers to understand the interventions needed along the corridor, whether behaviour change and/or infrastructure improvements, to help open up these spaces to everyone.



Investment

An SWC review in 2022 identified several million pounds of investment earmarked for access improvements. The Improvement Plan will be discussed with key fund holders and the wider public to optimise these investments and develop partnership opportunities for future investment.



Engagement

The River Access Improvement Plan will contain knowledge and expertise from local residents, community groups and local authorities. The Crane Valley story map will be used to gather further information from the public about access issues and opportunities.

How to get involved

Community engagement

To find out more about how to get involved with one of the many community groups in the River Crane catchment go to cranevalley.org.uk/get-involved.

We're keen to hear from the following in developing the External Engagement Strategy: community focused groups working on the Crane catchment; local residents and especially young people; politicians, local businesses and infrastructure organisations; and those with an interest in health and well-being. Contact us if you'd like to know more, see page 43. An approach to lifetime education will be developed later in the programme.

In collaboration with SWC partners, we'll engage these audiences in the SWC key themes, in line with our annual campaign focus.

There will be activity programmes to build on the existing citizen science work (Citizen Crane – see the biodiversity theme), practical conservation and social action volunteering already taking place throughout the catchment. A calendar of local events will be put together.

As a priority, we'll promote a sense of connection with the catchment through an engaging and accessible '10 things to do in the Crane Catchment' campaign.

Access to river corridors

Following the development of the River Access Improvement Plan, we'll collaborate with our SWC partners to further develop ideas for improving access. This will include working with local experts, such as residents and community groups, as well as those who would like to access the river but who currently can't.

We'll crowd source suggestions for additional complementary measures to improve access, such as places to stop and rest, or play, features to see or additional wayfinding needs, using the Crane Valley story map.



Contact the team for more information, see page 43 for details.

Enhance flood resilience

The current status

Flood risk is the likelihood of a flood event happening, and the impact the event may have on people, property and the natural landscape. It includes flood risk from all sources, including rivers, surface water, sewers and groundwater.

Surface water and sewer flooding occur during intense rainstorms that overwhelm the drainage network and cause the rainwater to run along urban streets, pool in topographic low points or cause sewer overflows due to a lack of sewer capacity. Groundwater flooding

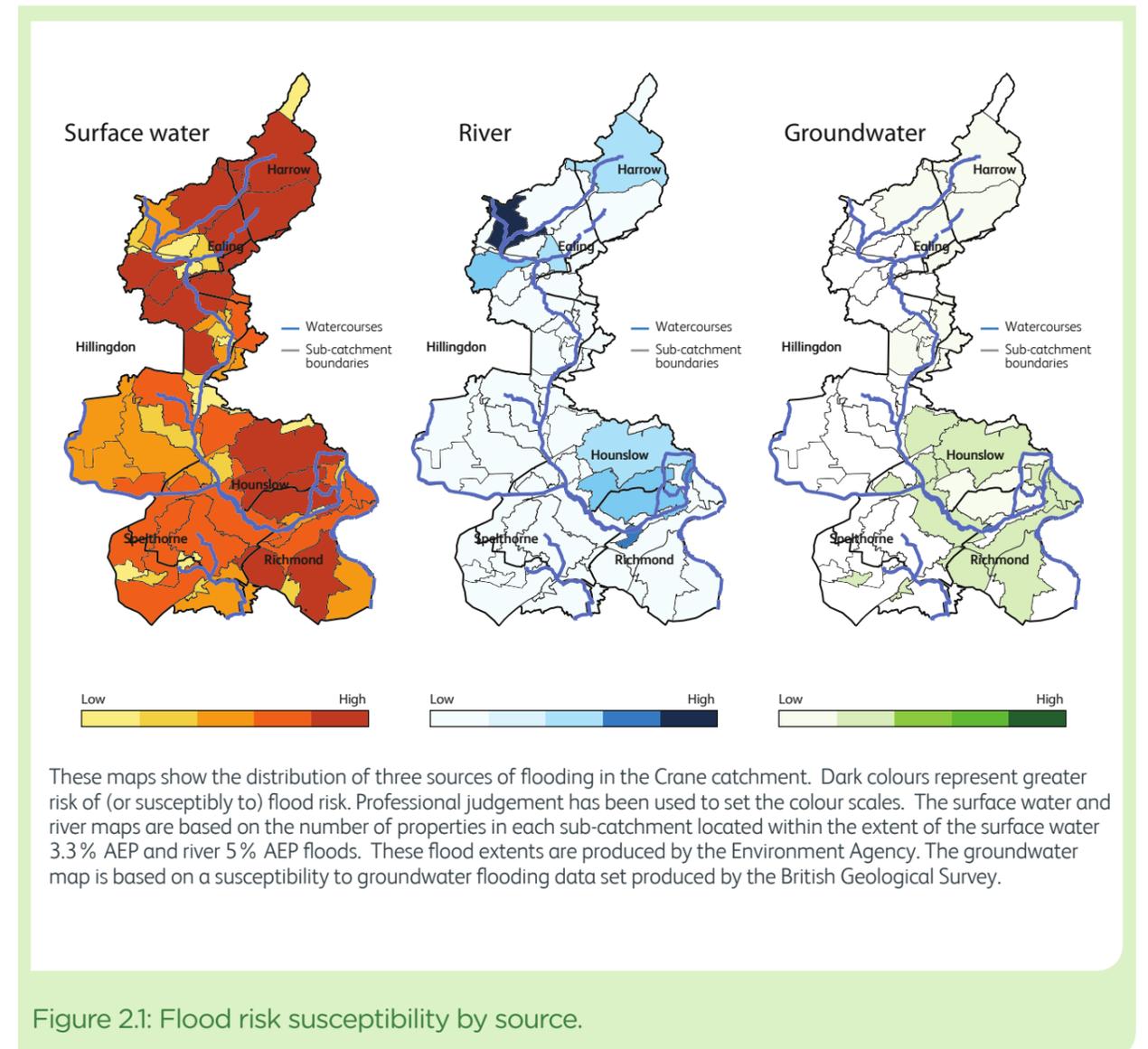


Figure 2.1: Flood risk susceptibility by source.

happens in locations with shallow aquifers (sub-surface rock formations that can store water) which become over-saturated and flow onto the ground surface or into basements of properties. All types of flooding are a risk to parts of the catchment - with surface water flooding forming the largest overall risk. Figure 2.1 shows the general susceptibility of the catchment to surface water, river, and groundwater flood risk. Surface water flooding is estimated to affect just over 10,000 properties in a 1% Annual Exceedance Probability (AEP) flood event. By comparison, flooding from rivers is estimated to affect less than 100 properties in a 1% AEP event.

Why things are like this

The catchment of the River Crane is heavily urbanised and large parts have the potential to be flooded. Much of the natural green corridor along the Yeading Brook and River Crane (known as the West London Green chain) has been protected from development over the last hundred years. This provides some natural floodplain as seen in Figure 2.2, and a large amount of river flood protection for the urban areas. Existing flood defence schemes along the river also provide protection for downstream properties.

The expansion of the urban area and its associated hard surfaces, combined with an increase in storm intensity caused by climate change, have put enormous pressure on the drainage network. During intense storms, surface drains are overwhelmed, and this leads to water overflowing onto roads and pavements and pooling in and around properties. If too much water enters the sewer network these can also overflow, adding to the overall flood problem as well as polluting the local environment.

Under current flood risk management arrangements, the Environment Agency maintains a strategic overview of major river flooding matters in the catchment. The Local Authorities - as the Lead Local Flood Authorities (LLFAs) - manage flood risks locally, working closely with Risk Management Authorities (such as Thames Water) in their areas. The Environment Agency distributes Defra funding to the Local Authorities for management of more localised surface water and watercourse projects.

These problems are particularly severe in the upstream catchment, north of Hayes, see Figure 2.1 (Surface water) above, partly because of the clay soil which means green spaces do not infiltrate water well. A related problem in the upstream catchment is the number of connections between the surface water and foul water drainage. These cause overflows in the sewer system and pollution of the surface water system.

Groundwater flood risk is most severe in Hounslow and Richmond boroughs. Water in the gravels of this southern part of the catchment can flood basements and low lying areas after heavy rainfall.



Figure 2.2: Flooded boardwalk in Donkey Woods. Deliberately designed localised flooding in parks allows space for water during heavy storms and reduces the risk of property flooding.

How can we make things better?

The open spaces along the river corridors need to be protected from development. Better connections to the river system provide additional wildlife and public value through the creation of backwaters and wetlands which are designed to be flooded, as well as increasing their flood protection value. There are many options for reducing flood risk by creating water storage. These can be small scale rain gardens, open channels known as swales, or larger wetland systems that intercept water and create high value features for wildlife. The SWC programme has identified over 20 catchment-based schemes that are planned over the next few years.

We've made an initial assessment of these schemes and identified opportunities for enhancing them for flood protection and other key themes under this programme.

The programme has already supported a major wetland, stream restoration and flood defence scheme at Headstone Manor in Harrow, see Figures 2.3 and 2.4. This is protecting many local properties from flooding while also providing significant amenity and biodiversity benefits within the park. The scheme opened last year, and we're currently monitoring it to help understand how this, and other similar schemes, might be improved.

The SWC programme is also supporting a scheme at the Pinkwells Estate in Hillingdon, introducing swales and rain gardens into this area of social housing. We're tracking many small scheme proposals in Hounslow under a parallel Thames Water funded programme and we expect to support lots more schemes over the next eight years to 2030.

Mogden sewage treatment works (STW) receives large volumes of surface water via combined sewers. Wetlands like the ones being assessed by the SWC programme, as well as other sustainable drainage systems (SuDS) eg. detention basins, rain gardens and swales, will intercept this surface water before it reaches the sewer system. This reduces the volume of sewage that needs treatment at Mogden STW, which in turn reduces the risk of the works being overwhelmed.



Figure 2.3: Headstone Manor wetland scheme during construction.



Figure 2.4: Headstone Manor completed scheme.

How to get involved

Local authorities and councillors can ensure that local policies protect green spaces and encourage the creation and use of green space for flood risk management. Flood alleviation schemes can be promoted that deliver wider community and environmental benefits as well as reducing flood risk to people and property.

Local residents can get involved by reporting flood incidents in their properties, highways, or public spaces. Contacts for Thames Water and each borough are provided below. All residents can benefit from installing a water butt for use in the garden, while reducing the amount of hard surfacing in drives and gardens can

also be beneficial because it allows water to slowly filter through rather than rapidly run off into nearby drains. These are small scale changes but if lots of people do them, they can significantly reduce flooding in your neighbourhood. Residents can also talk with local councillors to register their support for flood related projects and schemes.

Developers in the catchment must follow London's Drainage Hierarchy and should implement SuDS within their developments to manage site runoff. Local authority and Thames Water contacts are detailed below. For more information, please see page 43.

Contact details for Lead Local Flood Authorities (LLFAs).

 **Ealing LLFA:**
020 8825 6600

 floodrisk@ealing.gov.uk

 **Hounslow LLFA:**
020 8583 2000

 customerservice@hounslow.gov.uk

 **Harrow LLFA:**
020 8863 5611

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 **Thames Water:**
0800 316 9800

 thameswater.co.uk/contact-us

Improve water quality

The current status

Water quality in the Crane is subject to long-term background problems and occasional highly damaging pollution events which are typical of urban river catchments, see Figure 3.1. Achieving and maintaining high quality urban river systems is a complex challenge. Overall, the upstream tributaries of the river have the poorest water quality, failing against current environmental quality standards, but water quality improves with distance downstream. There's also further improvement after the Upper Duke of Northumberland's River joins the main channel, transferring water from the Chalk fed Colne River system to the west.

The river is subject to background pollution from many misconnected properties, which put foul water into the river rather than the sewer system. An average 3% misconnection rate has been reported from site investigations in the London region. Thames Water identified, and home-owners then removed, 455 misconnected houses from the river system between 2015 and 2020. Unfortunately, new misconnections are added every year so the overall problem may not be improving.

There are small and medium sized pollution incidents most years. In 2011 and 2013, there were major pollution incidents that killed nearly all downstream river life. These led to the formation of the Citizen Crane initiative, where (from 2014 to present) teams of volunteers visit the river every month and collect information on water quality and ecological value.

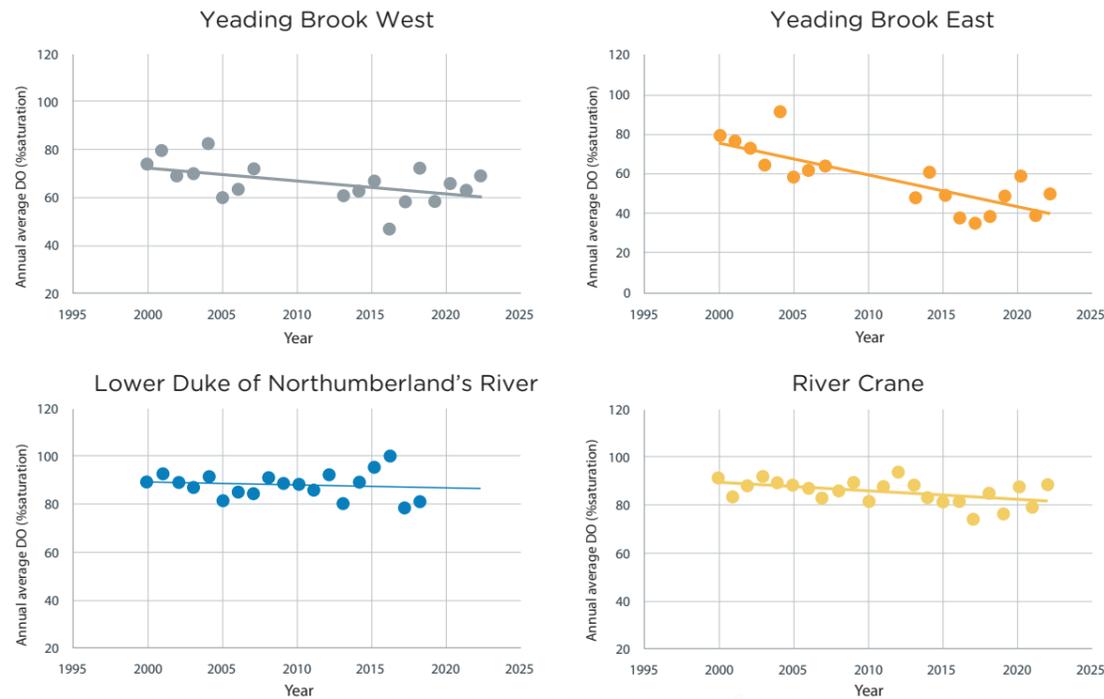
This work has helped to develop a much better understanding of the river, and many pollution problems are now reported at an early stage to our partners in the Environment Agency and Thames Water. The road network includes many busy routes such as the M4, M40 and A312. These generate polluted run-off, from oil leakages and the breakdown of tyres and brake pads, which puts toxic pollutants into the river system. When a rainfall event follows an extended drought period, the first flush of pollution can be enough to seriously damage the river and kill fish.

Water quality is very closely linked to habitats and the biodiversity of the river system. Sustained poor water quality can make a freshwater environment inhospitable to many plants and animals. In turn, low quality river habitats can compound poor water quality by reducing a river's ability to generate oxygen and to trap and process pollutants.

Dissolved Oxygen (DO) is the amount of oxygen available in the water. All living things need oxygen, including fish and other river life. Too many nutrients from sewage and other pollution sources reduces the amount of oxygen and can lead to large-scale fish kills. The graphs in Figure 3.1 show long-term trends in the amount of DO in different parts of the river system, while the map in Figure 3.1 shows how recent DO concentrations improve further downstream.



Long-term trends in annual average Dissolved Oxygen by water body



Recent five-year average Dissolved Oxygen at monitoring sites

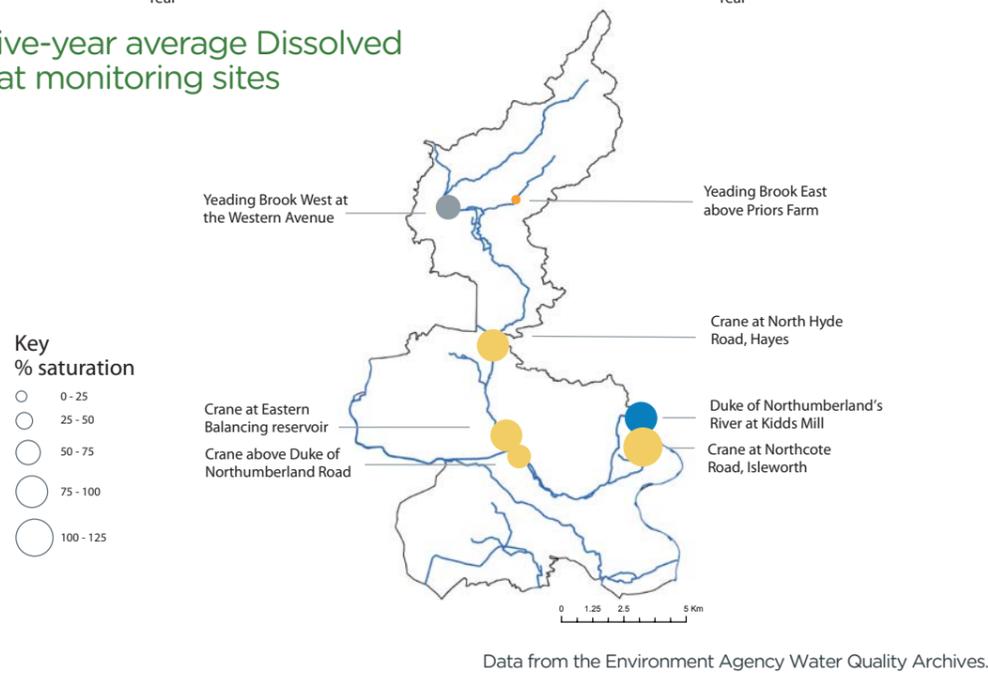
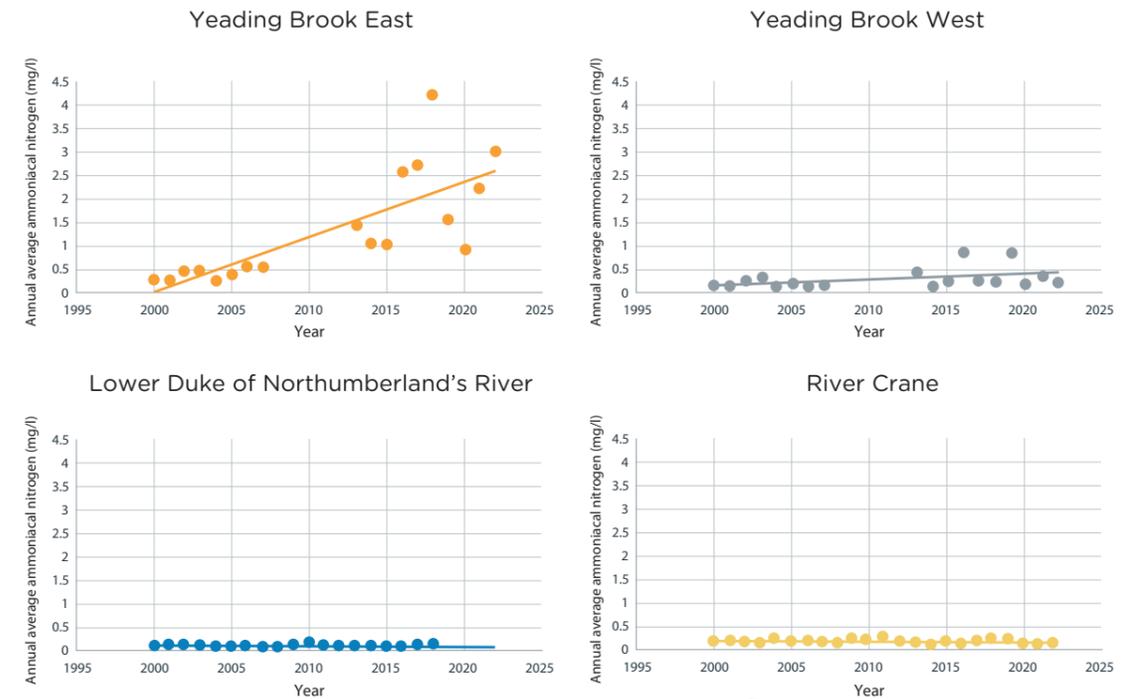


Figure 3.1: Long-term trends and recent concentrations in Dissolved Oxygen.

These data show how the river has a poor DO concentration in the upstream tributaries and improves to a good condition downstream. The data also show that the conditions have worsened significantly over the last 20 years, particularly in the upstream parts of the river.

Ammoniacal nitrogen (TAN) is toxic to aquatic life in higher concentrations. The main source in an urban catchment is sewage effluent. The graphs in Figure 3.2 show long-term trends for TAN at sites across the catchment. The map in Figure 3.2 shows the spatial differences in ammonia using recent 5-year data, specifically how sites upstream have alarmingly high concentrations of it.

Long-term trends in annual average Ammonia (as N) by water body



Recent five-year average Ammonia (as N) at monitoring sites

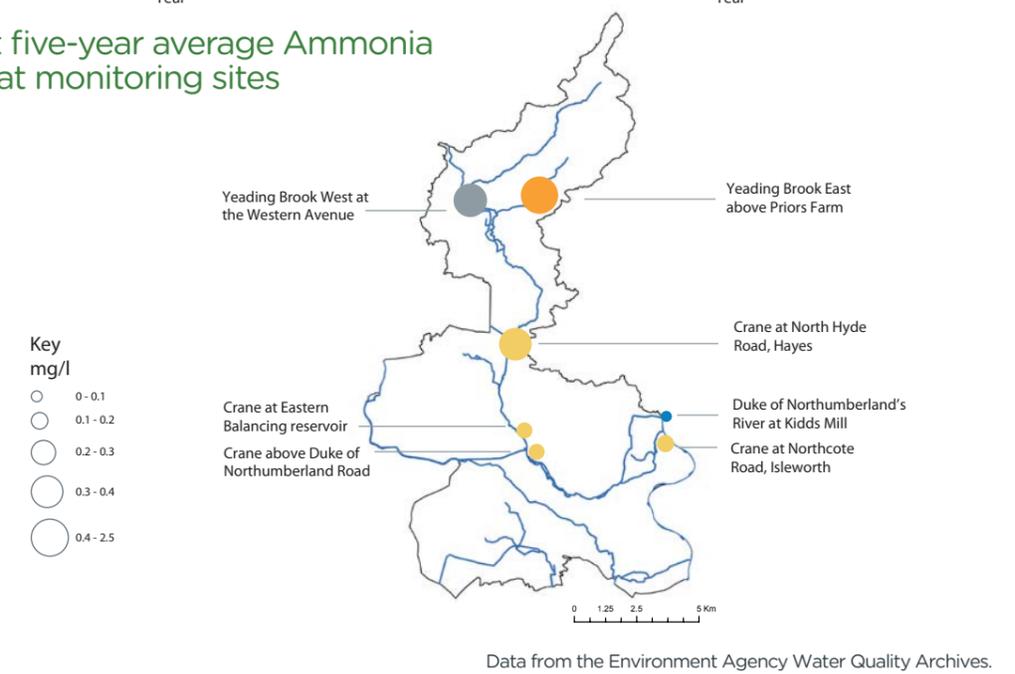


Figure 3.2: Long-term trends and recent concentrations in Ammonia (as N).

These data re-enforce the message from the Dissolved Oxygen data set that water quality is poor at the top of the catchment, and it's been getting significantly worse over the last 20 years.

Conditions are generally better, or good, towards the bottom end of the river. And the fact that the river is

significantly better downstream is encouraging. Detailed work by the Citizen Crane team has shown that this isn't just because of dilution. It is also due to the active self-cleansing of the system by the actions of aeration, plants and sedimentation in the more naturalised sections of the rivers downstream.

Why things are like this and how can we make things better?

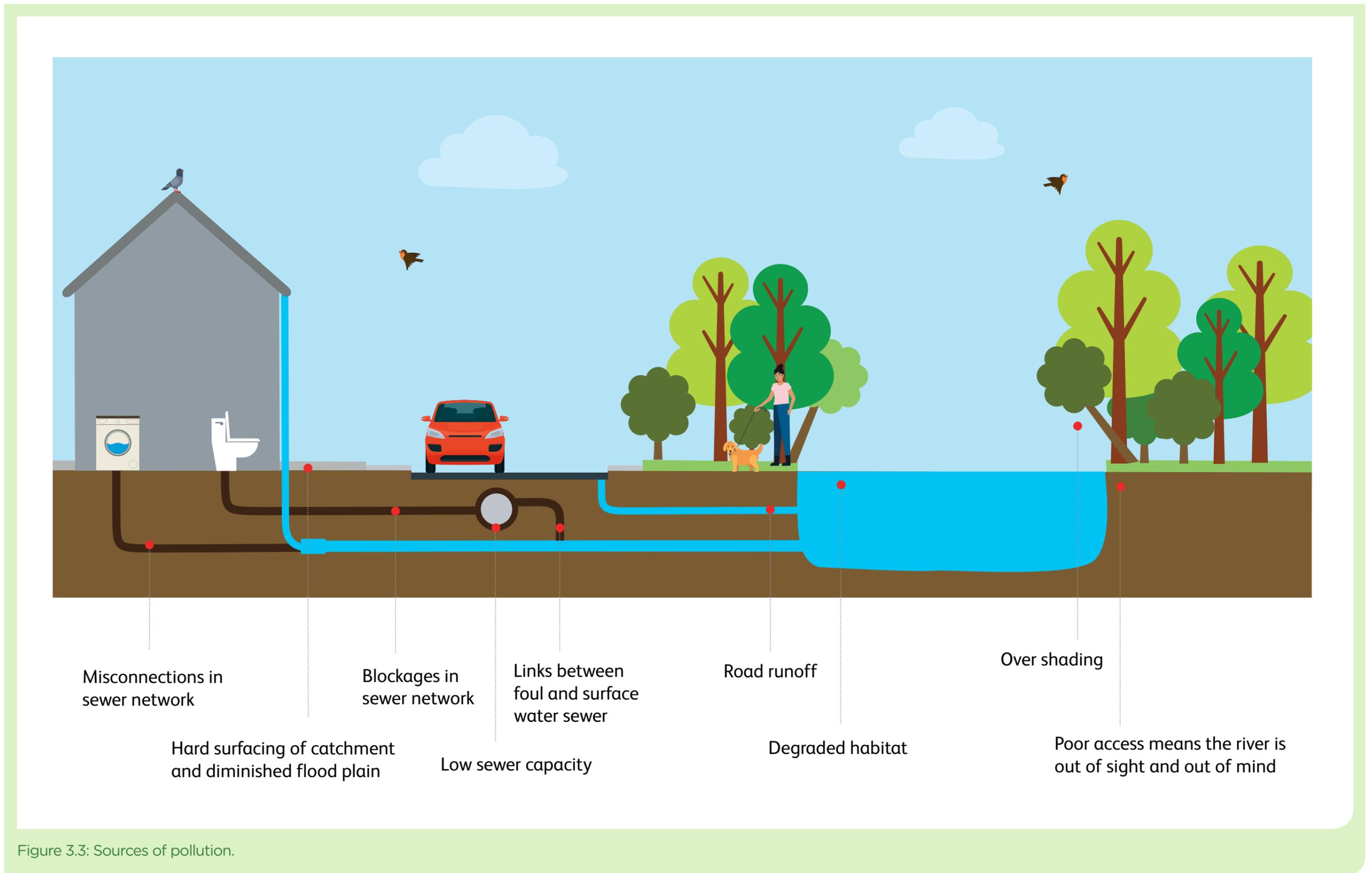
There are a number of water quality threats to the rivers and watercourses in the Crane catchment. We outline in Table 2 below the key threats, their impacts and the mitigation measures we are exploring through our partnership work.

Table 2: Water quality threats.

Threat					
Foul water getting into surface water	Inadequate sewer infrastructure	Noxious substances polluting the river	Poor river habitat	Polluted road run off	Lack of awareness
Foul water gets into the surface water system through property misconnections, sewer blockages and cross-connections between the two networks	Inadequate sewer infrastructure - eg. dual manholes with cross connections and low sewer capacity	Pollution of noxious substances into the river caused by incidents, accidents or disposal of liquids	Poor river habitat, little wetland habitat and too much shade	Polluted road run-off	Out of sight out of mind
Impact					
<ul style="list-style-type: none"> Nutrient pollution High concentrations of toxic ammonium, particularly after rain 	<ul style="list-style-type: none"> Nutrient pollution High concentrations of toxic ammonium, particularly after rain 	<ul style="list-style-type: none"> Major pollution incidents can cause fish kills and wipe out lengths of the river. Minor incidents add to the chronic load on the ecosystem 	<ul style="list-style-type: none"> Reduced nutrient removal from river vegetation Reduced silt and pollution trapping from marginal vegetation 	<ul style="list-style-type: none"> First flush reduces DO and kills fish Accumulation of oils and heavy metals in the sediment causes chronic damage to the ecosystem 	<ul style="list-style-type: none"> Lack of awareness so less pressure for change
Mitigation					
<ul style="list-style-type: none"> Thames Water, with help from community initiative Citizen Crane, carry out regular monitoring to identify and resolve misconnections and cross-connections Volunteer led SWOP (Surface Water Outfall Programme) uses data from outfall safaris to trace where pollution is coming from Public help to report pollution problems Public awareness of misconnection problem increased Public awareness of sewer blockage risks increased Council Environmental Health officers follow up where misconnections are not mended 	<ul style="list-style-type: none"> Thames Water traces and rectifies inadequate assets Long-term investment into Drainage and Wastewater Management Plans 	<ul style="list-style-type: none"> Many pollution incidents have been identified and reported by local people and Citizen Crane volunteers over the last eight years Reporting to the Environment Agency and Thames Water ensures a rapid response The Outfall Safari is carried out by volunteers every few years and each time has identified ten or more chronic pollution problems, many away from public view Raise public awareness of the link between drains and the river to help reduce the frequency of noxious liquids being poured into road drains 	<ul style="list-style-type: none"> River restoration such as the work in Crane Park in Twickenham. More light into the river allows plant growth and marginal reed beds and habitat areas trap sediment Wetland creation, such as at Newton Park in Harrow and Spider Park in Hillingdon intercepts polluted sediment and allows time for plants to remove nutrient from the water. Monitoring at Newton Park wetland over several years showed this reduced ammonia levels by 50 per cent 	<ul style="list-style-type: none"> Highways Authorities prevent pollution leaving their assets Long-term investment into Drainage and Wastewater Management Plans 	<ul style="list-style-type: none"> Engage and educate decision makers and the wider population – supported by citizen science monitoring



Figure 3.3 below, illustrates the links between sources of pollution and the river.



How to get involved

Some of the key water quality problems in the Crane are caused by the links to the foul sewer network. Long-term planning and investment in sewer infrastructure is needed to tackle this. One of the mechanisms will be Thames Water's Drainage and Wastewater Management Plan, which sets out how wastewater and drainage networks will be maintained and improved. Other major stakeholders in the catchment such as National Highways, Heathrow and Transport for London need to fulfil their duties and minimise their impacts on the river.

Improving water quality isn't just about stemming the flow of pollutants. There also needs to be more capacity for processing pollutants and more resilience to extreme weather events. This can be achieved by restoring river habitats, building wetlands and other SuDS in the wider

surface water network and allowing more light into the river to help plants grow. Local authorities that invest in restoring the river and creating habitat will also be investing in improving water quality for the catchment as a whole.

Citizen Crane is an active community science programme focusing on water quality and river wildlife in the Crane Valley. It helps to support communities along the river corridor to monitor its health and become river stewards. To find out more about how to get involved, go to: cranevalley.org.uk/get-involved.

The wider public can help by telling neighbours that road drains connect directly into the river system and aren't to be used for disposal of waste liquids.



All pollution incidents should be reported to the Environment Agency's hotline: **0800 80 70 60** and to Thames Water: **0800 316 9800**.

Improve geomorphology

The current status and why things are like this

River geomorphology investigates the form (morphology) of rivers and floodplains and the processes that create, maintain, and change them and their physical habitats. Figure 4.1a shows a river where all natural geomorphological forms and processes have been suppressed by human actions. Figure 4.1b shows a geomorphologically active channel, where the river's flow is scouring the bed and then depositing sediment to build bars and islands within the channel and extend the channel banks with vegetation colonising these features. We're investigating the geomorphology of the River Crane to understand the types of physical habitats that are present, how they change naturally, and how much our actions affect these natural processes.

We've collected information at two levels:

- At a coarse scale, we've assessed the geomorphological health of the river by investigating whether the river channel has been able to move to create new channel and floodplain habitats since it was mapped by the Ordnance Survey during the 1890s. We've also done walkover surveys to visually assess whether the present river course and channel cross section appear to be modified by human activity
- At a finer scale, we've extracted indicators of the complexity of the river's morphology and vegetation structure from detailed field surveys of over 40 reaches of the river



Figure 4.1a: Straightened, over-wide, over-deep and reinforced channel with no natural geomorphological function and little habitat to support wildlife.

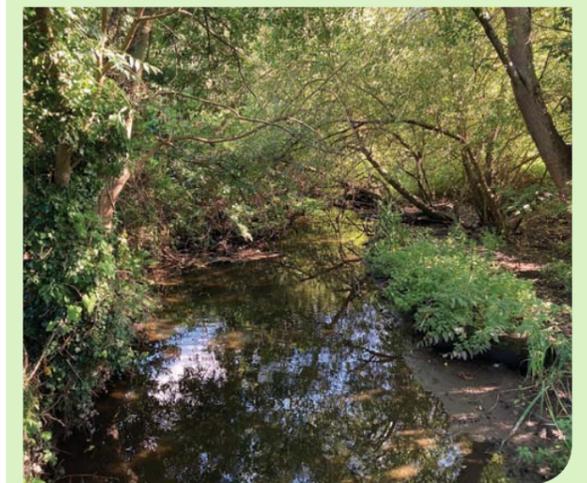


Figure 4.1b: Geomorphologically active channel with a variety of changing physical habitats - created by the water scouring the riverbed and banks and depositing sediment, which is colonised by vegetation.



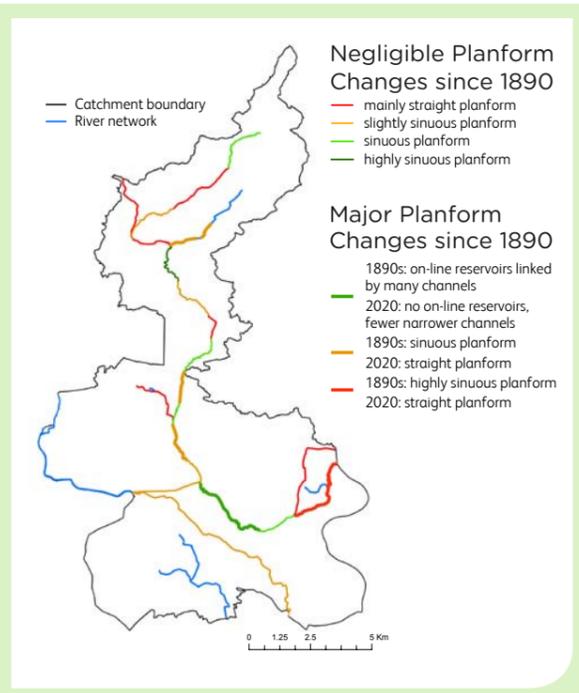


Figure 4.2: River channel pattern (planform) and any planform changes since the 1890s (fine lines show negligible change, wide lines show significant change).

Most river channels were already straightened and modified by the end of the 19th century. But a few reaches are still relatively unmodified or have only suffered from human modification recently, see Figure 4.2. Many river channel profiles show little recovery from past enlargement, bank re-sectioning and reinforcement. The good news is that more natural profiles are emerging in some reaches, particularly where decaying wooden bank reinforcement is being washed out and trees are left to grow along the river, see Figure 4.3.

Long-term modifications of the river and its floodplain have resulted in widespread physical habitat degradation. Currently, the highest diversity of physical habitats, see Figure 4.4 and bank vegetation, see Figure 4.5, are found along Yeading Brook West and in the largely wooded middle reaches of the main River Crane. Few reaches show structurally complex aquatic vegetation as shown in Figure 4.5, mainly because this requires a combination of exposure to sunlight and limited human management.

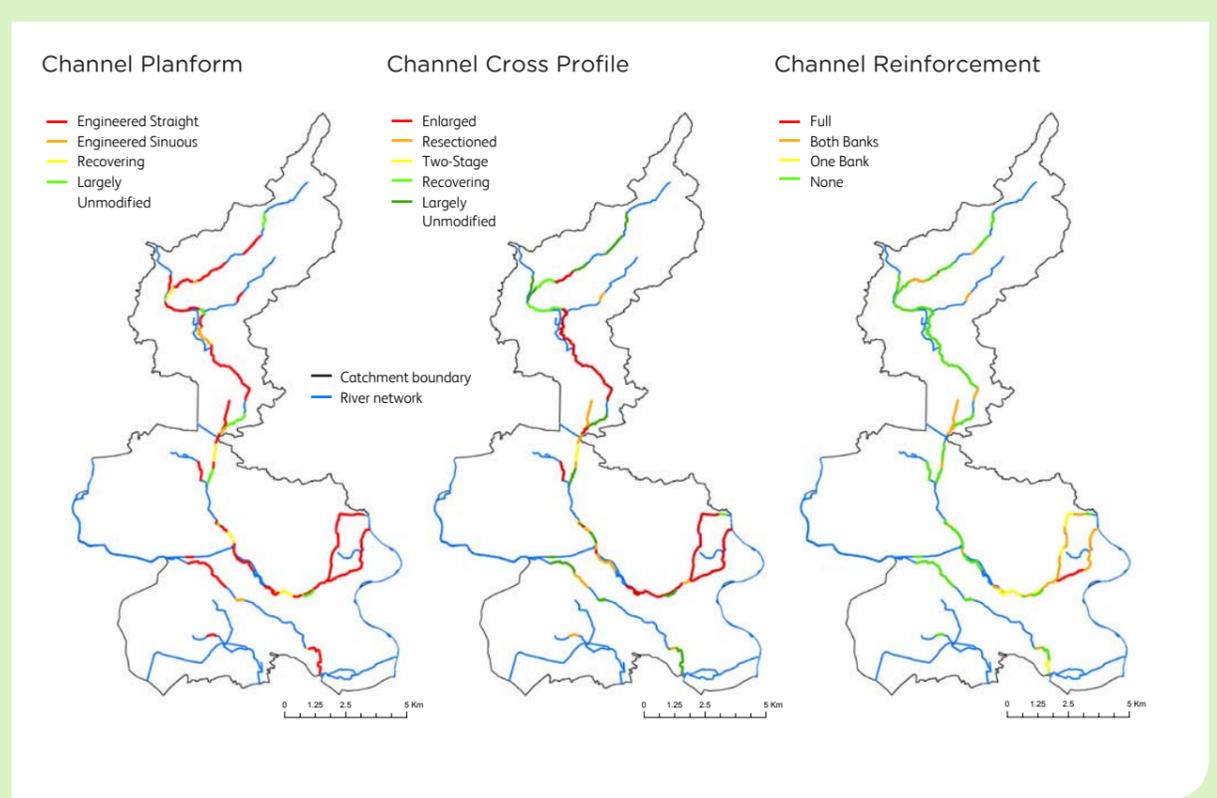


Figure 4.3: Apparent degree of channel planform modification, channel profile modification and bank/bed reinforcement (visual observation during June to September walkover surveys in 2021 and 2022).

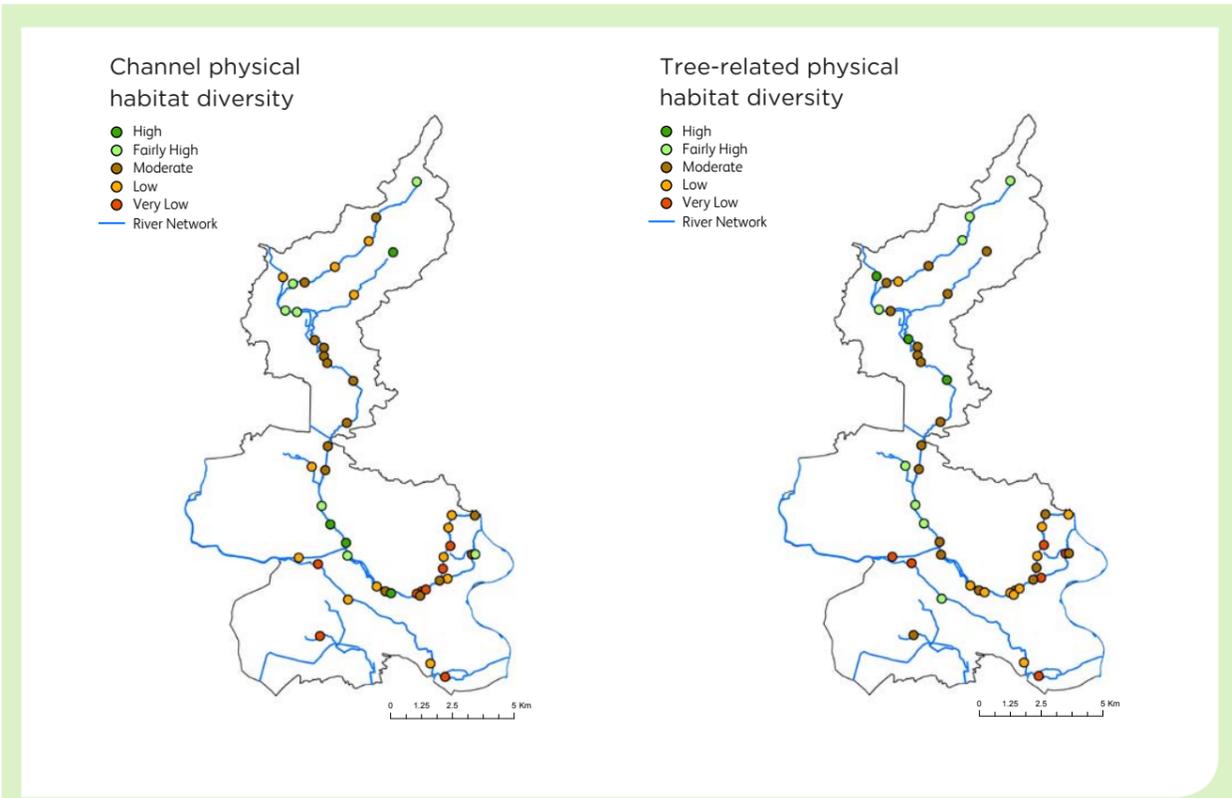


Figure 4.4: Relative diversity of channel physical habitats and tree-related habitats across the river channel bed and banks (indicators derived from Urban River Surveys).

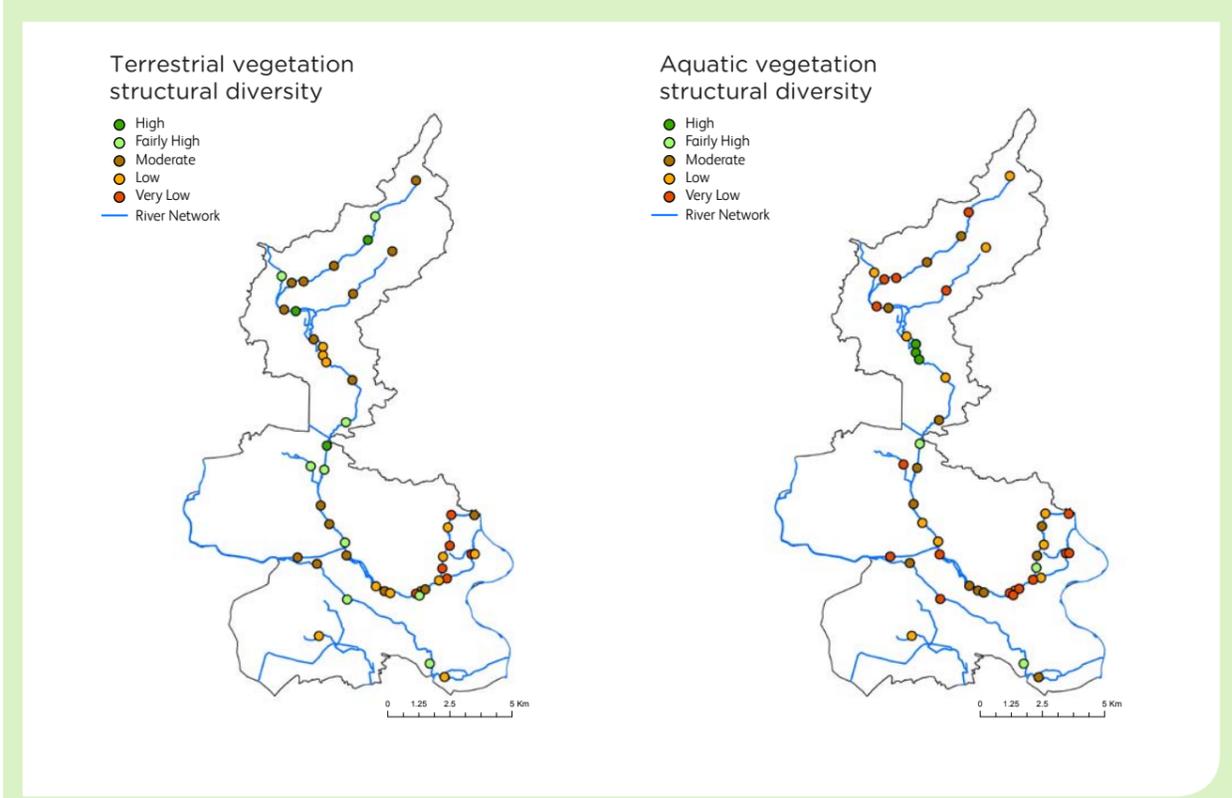


Figure 4.5: Relative diversity in vegetation structure across the bank faces and bank tops (terrestrial plants) and across the riverbed (aquatic plants) (indicators derived from Urban River Surveys).

How can we make things better?

Where rivers are in a good condition, or appear to be recovering naturally, best practice is often to let nature take its course. However, in heavily modified river corridors, such as those seen in parts of the Crane catchment, interventions are often necessary to reduce the level or type of modification in order to support natural physical habitat recovery and, in some locations, to artificially create physical habitats. We're using the MoRPH river morphology monitoring tool to understand the existing geomorphology at several sites where restoration works are underway or planned and to monitor physical habitat recovery. These include:

- The lower Crane in Twickenham where a 30 metre length of concrete wall has been removed and a new

river berm introduced, transforming a short part of this concrete lined section, see Figure 4.6

- The main river at Pevensey Nature Reserve near Feltham where the river is currently straight and overwide. Restoration works, combined with new backwater channels, are planned for winter 2023 and linked to a water vole release scheme
- The western Yeading Brook tributary at Yeading Walk, where the removal of concrete panels and restoration works are planned for 2023

We'll learn lessons from this work that can then be applied to other sites across the catchment.



This series of three photographs show the development of a field trial on the Lower Crane over spring and early summer 2022. The site is on the concrete lined Lower Crane in Twickenham, as also shown on the front cover. This trial removed 30m of concrete bank from the south side of the river and installed 30m of rock roll berm on the north side, with further gravel placed in the channel. The site is being monitored by ZSL over the next year. To date (August 2022) the planting has developed well despite the summer drought.

Figure 4.6: Lower Crane River restoration field trial.

How to get involved

Various river restoration works across the catchment are being delivered with volunteers and this is often the best way of providing long term and cumulative benefits to the system which can be refined over time. These projects welcome new volunteers and provide practical training on how to do this work.

The MoRPH monitoring will also be delivered with the support of volunteers. Training will also be provided to local groups that wish to understand more about how the river morphology works and how we might work together to change it for the better. See page 43 for more information on how to get involved as a volunteer.



We also encourage any local landowners and associated officers to contact the team for more information about the work being delivered and the opportunity to include projects in your area. See page 43 for contact details.



Enhance biodiversity and environmental connectivity

The current status

This is an urban river system, and the ecosystem is vulnerable to pollution. The removal of natural characteristics such as a connected floodplain results in a loss of habitat as well as leaving fish populations more vulnerable to pollution and less able to shelter from the impact of high flows. The ecosystem is also vulnerable to extended periods of low flow, as seen during the summer 2022 drought. The Upper Duke of Northumberland's River, and the lower Crane below the Lower Duke of Northumberland's River offtake, have

been shown to be particularly vulnerable. Despite this, there are varied and reasonably well connected habitats along the river corridors and associated open spaces of the Crane Valley and these support many river and land based animals and plants, see Figure 5.1. But these habitats and associated species are under pressure from the surrounding urban setting – including the impacts of people and their dogs, pollution, development, climate change and the consequent impacts on habitat quality and connectivity.

 <p>European water vole (<i>Arvicola amphibius</i>) Live along streams and ditches, making burrows in the riverbank. Facing serious threat due to habitat loss and predation by mink.</p>	 <p>Lesser noctule (<i>Nyctalus leisleri</i>) Found in woodland, farmland and parks. Scarce in Britain, though have a wide distribution.</p>	 <p>Adder (<i>Vipera berus</i>) The UK's only venomous snake. Threatened by loss of habitat, including woodland, grassland, and heathland.</p>	 <p>Barn owl (<i>Tyto alba</i>) Found in grassland, heathland, farmland, and wetland. Though widely distributed, faced declines through the 20th century.</p>
 <p>Peregrine falcon (<i>Falco peregrinus</i>) Populations have recovered from 1960s declines caused by persecution and pesticides. Now, commonly found habitating urban areas.</p>	 <p>European eel (<i>Anguilla anguilla</i>) Migratory species that spend the majority of lifecycle in freshwater and estuaries, and migrate to the Sargasso Sea to spawn. Critically endangered due to habitat loss, barriers to migration, poor water quality, etc.</p>	 <p>Kingfisher (<i>Alcedo atthis</i>) Prefer areas of slow moving or still water, hunting from riverside perches. Sensitive to habitat degradation through pollution or poor river management.</p>	 <p>Banded demoiselle (<i>Calopteryx splendens</i>) Found along slow-flowing lowland streams and rivers. Sensitive to pollution and bankside vegetation.</p>

Figure 5.1: Key animal species identified in the River Crane catchment.

Various projects are in progress to support and enhance these species, including:

- Two successful kingfisher nesting banks created in the lower Crane, with more likely
- Water vole surveys and habitat creation with plans to release several hundred water voles over the next two years to replenish the existing moribund population
- Bat monitoring work to understand their distribution and better protect and enhance their habitat
- Eel passes installed to allow eels to enter the river from the Thames and then traverse various in-river barriers
- Other fish passes have also been installed in recent years, most recently a major fish pass for Mereway weir in the lower Crane
- Hounslow Heath supports one of the few populations of adders in Greater London. Work by the volunteer Hounslow Heath Rangers and council helps to preserve and enhance their heathland habitats

The project team has also started to collate information on the distribution of invasive species across the catchment. Giant hogweed, Japanese knotweed and floating pennywort are the three major problem plant

species identified to date, with large riverside colonies in the middle of the catchment in Hillingdon and Hounslow in particular.

Benchmarking the current state of the Crane Valley's habitats and biodiversity allows the success of conservation work to be assessed.

Fish diversity

An increase in the number of fish species present indicates an improvement in environmental conditions. In contrast, a decline in the diversity of species, especially a dramatic decline, indicates significant damage to river health.

Data for the main River Crane and the Upper and Lower Duke of Northumberland's River are shown in Figure 5.2. There are no clear patterns revealed here over time or between water bodies –which is surprising given the two major pollution related fish kills seen in the river in 2011 and 2013. This may be due to subsequent re-stocking. Note, at the time of writing there have been no data collected since 2018.

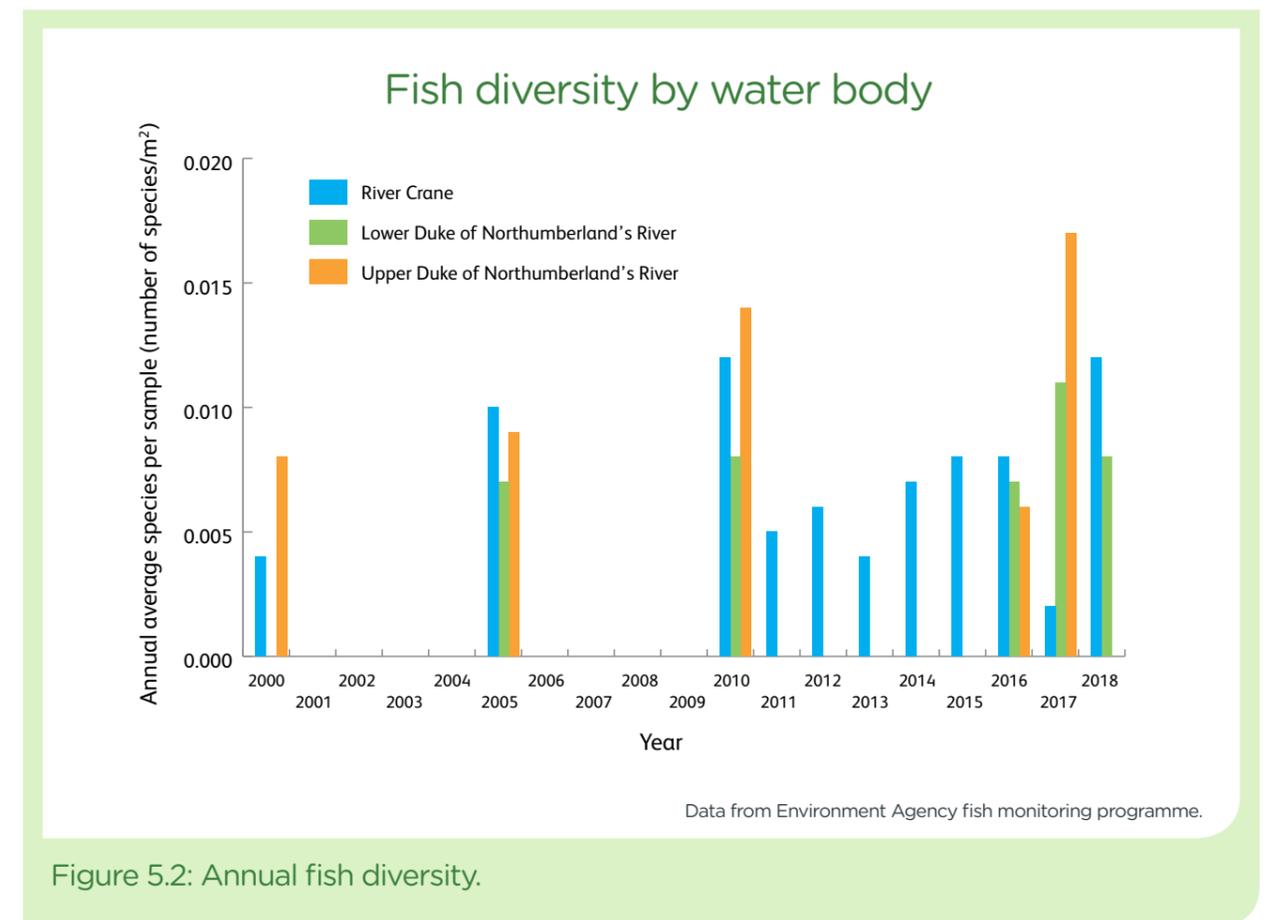


Figure 5.2: Annual fish diversity.

River invertebrate diversity

The diversity of the invertebrates in the river is closely linked to river health as some species are less tolerant of pollution and degraded habitat than others.

Long-term data from the Environment Agency can be seen in Figure 5.3 below. These show clearly how the diversity of river invertebrates is very low in the upper

parts of the catchment and increases with distance downstream. This is consistent with the water quality, which also improves downstream. The long term data indicate a significant reduction in the health of the upstream parts of the river over the last 20 years and a minor reduction in health of the main river downstream.

Long-term trends in annual average number of taxa per sample



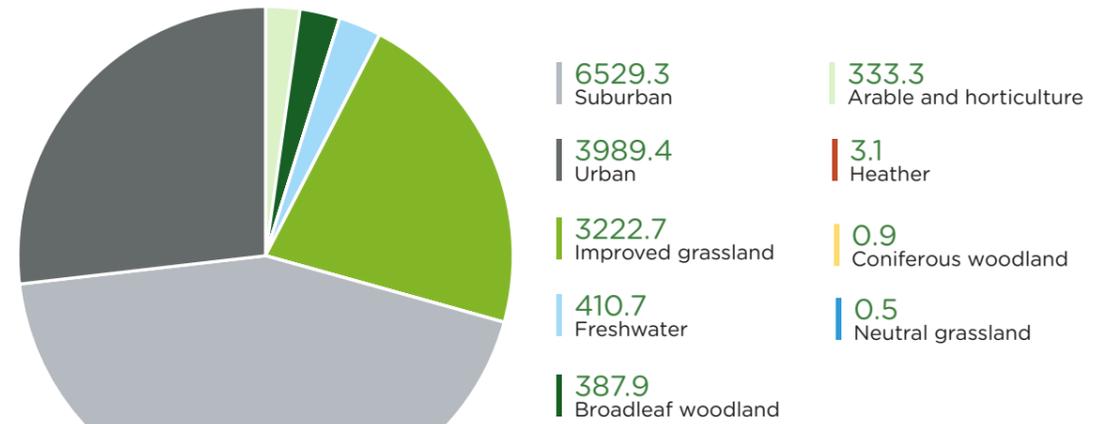
Figure 5.3: Long-term trends and five-year averages for aquatic invertebrate taxa.

Habitat extent

An overview of the different habitats and land cover in the catchment is shown in Figure 5.4. This shows the large amount of urban and suburban land cover as well as the distribution of improved and neutral

meadow grassland, heathland, fresh water, coniferous and deciduous woodland habitat. Note that there is also a small amount of acid grassland habitat on Hounslow Heath and elsewhere.

Habitat types by area



Data from Centre for Ecology and Hydrology 2015 Land Cover Map.

Figure 5.4: Habitat and land cover types.

Overall, the picture presented on biodiversity is mixed. The catchment has some important species for urban West London – with water vole and adder colonies of regional importance. New passes have allowed the Critically Endangered European eel to migrate into the river from the Thames in large numbers for the first time in many years. Kingfishers can be seen in most parts of the river corridor and are a key indicator of healthy fish

numbers as well as a joy to see for many local residents. The overall variety of riverside, wetland, heathland and meadow habitats is valuable, particularly in a densely populated urban context. However, the two key indicators of fish and river invertebrates show that the river condition has not changed for the better, and parts of it have changed for the worse, over the last 20 years.

Why things are like this

The biodiversity of the river itself is controlled largely by water quality and geomorphology. Indicators of negative trends in river biodiversity mirrored the water quality data and to some extent the geomorphology data. The most encouraging aspect of these data is the much better habitat value downstream, which demonstrates the river's remarkable capacity to cleanse itself.

The river corridors are surrounded on all sides by urban and suburban development but are still able to retain habitats and species of high value. These are often surviving only by the efforts of a few council officers, and a larger number of volunteers, who have been investing enormous effort over many years to preserve and enhance these fragile habitats. There now needs now to be a more concerted push to make things better.

How can we make things better?

Along with monitoring the habitats and biodiversity in the catchment, action is being taken to improve these natural areas and the wildlife that depend on them. Newly created wetland habitat at Headstone Manor Park will be closely monitored by local community volunteers working with Citizen Crane. In Hillingdon's Elephant Park, wetlands have been created, and surface water channels taken out of culvert, to create new surface water streams. In the lower Crane, London Borough of Richmond have piloted the breaking out of a section of the concreted channel, built over 100 years ago, to create new backwater habitat.

These projects need to be learnt from, replicated and scaled up to deliver a transformative impact on the biodiversity of the river corridor.

In addition, a concerted effort is required to remove invasive species from the catchment, starting with Japanese knotweed, floating pennywort and giant hogweed. These three species are taking a stronghold in parts of the corridor and without major and concerted actions by the key local authority landowners they risk

swamping the natural habitat and creating significant public health and land value risks to the surrounding area. Species targeted conservation is also starting up in parts of the catchment. Best practice approaches to encouraging kingfishers, water voles and bat species for example, can be developed and rolled out across the catchment. More work can also be done to open up all parts of the river by adding fish and eel passes. Discussions are ongoing with the Environment Agency to increase the resilience of the Upper Duke of Northumberland's River and the lower Crane to droughts by enhanced management of the flow controls on these parts of the river system.

How to get involved

Coordination of conservation activities across councils is essential, to ensure biodiversity improvements stretch beyond borough boundaries. Looking further across the region, it's important to prioritise the restoration and protection of river corridors to support rewilding London, making the city more resilient to climate change and a better place to live.

Local people can also get involved in conservation efforts by volunteering with one of the many organisations throughout the catchment that lead conservation work. To find an organisation local to you, go to cranevalley.org.uk/get-involved.

Some of the activities available in the catchment include:

- Wildlife surveys (eg bats, butterflies, amphibians and invertebrates)
- Litter picking walks and clean up days
- Habitat creation and management (eg wetlands, hedgerows, meadows etc)



You can also report unusual wildlife sightings to **Friends of the River Crane Environment** www.force.org.uk/get-involved/report-a-sighting/ and **Greenspace Information for Greater London (GIGL)** www.gigl.org.uk/submit-records/.



Looking forward

Delivery of our Smarter Water Catchment plan is in its early stages but has the potential to bring tangible benefits to the whole catchment – improving what’s there while making it a more resilient landscape as pressures change.

Thinking big in a connected and coherent approach is the best way to achieve this, done collectively. This is particularly important in the Crane Valley, which connects over 650 000 people, over five London Boroughs.

There are opportunities to get involved at all levels of this project helping to shape, direct, and implement what’s done. These opportunities support a catchment

where people and wildlife can thrive, and where the needs of both aren’t considered in isolation but where it’s understood that the health of one directly influences the health and happiness of the other.

Please help us make this a reality, whether it’s doing something big or small, through individual actions, or supporting the delivery of projects on the ground.

Thank you



You can read and download the River Crane Smarter Water Catchment plan at: <https://www.thameswater.co.uk/about-us/responsibility/smarter-water-catchments>

Ways you can help

There are lots of ways you can help support the River Crane catchment, including these below:

- Get involved with your local community stewardship group
- Become a citizen scientist - help record the state of the river and its wildlife
- Do your bit to reduce flooding - by installing water butts or reducing hard-standing in your garden
- Let our partners at the Environment Agency know if you see a pollution or flooding incident on a watercourse
- Let our partners at Thames Water know if you see flooding or pollution from a sewer or burst water main
- Get involved in river and habitat improvement works by volunteering with organisations such as the London Wildlife Trust
- Reporting sightings of unusual animals and plants. The easiest way to do this is on the Greenspace Information for Greater London web portal - www.gigl.org.uk/submit-records/
- Join in the conversation by signing up to the CVP’s newsletter, social media and by encouraging your friends and family to do the same



For further details on how to get involved visit: www.cranevalley.org.uk/get-involved.



Acknowledgements

The Crane Valley Partnership and Thames Water would like to thank all of the organisations and individuals representing the partnership, who have contributed their valuable technical inputs, insights and time during the process, through various fora and engagement platforms, to enable the joint development of our plan and subsequently this report. We greatly appreciate the commitment and enthusiasm expressed to achieve this vision and look forward to working together to deliver the plan.

The information provided to develop this report is correct as of 1st October 2022 and has the formal support of key stakeholders.

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Sustrans
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Thames Water
www.thameswater.co.uk/

Zoological Society of London
www.zsl.org/

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Pages 6 to 7 and 18 photos - Friends Of the River Crane Environment

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Page 19 photo - London Borough of Harrow

Page 19 photo - Peter Elton

Pages 21, 28, 33 photos - Zoological Society of London

Page 29 photos - Cartographer

Page 32 photos - Wild Future

Page 34 photos - Thames Water

Page 43 photo - Friends of Kneller Gardens

Further information



If you would like to find out more about the current state of the River Crane catchment there are more detailed reports on each of the key themes at: www.cranevalley.org.uk/project-archive-library/.

These reports are based on investigations carried out through the Smarter Water Catchment programme.



If you have any questions or comments about our work in the River Crane catchment please contact the Crane Valley Partnership: cvp@cvcic.org.uk.

For Smarter Water Catchment programme information please contact Thames Water: partnerships@thameswater.co.uk.



Working in partnership



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