CELEBRATING 25 YEARS OF THE CHILTERNS CHALK STREAMS PROJECT

CHILTERNS
CHALK STREAMS
PROJECT

Restored River Misbourne,
Doctor's Meadows,
Little Missenden

Front cover image:
Classic chalk stream habitat,
River Chess at Latimer Meadows

CHILTERNS
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FOREWORD

2022 marks the 25th anniversary of the Chilterns Chalk Streams Project. I'm immensely proud of the Project's dedicated work to conserve and enhance our nine precious chalk streams in the Chilterns. Chalk streams are key features of the Chilterns landscape, and these special threatened habitats are of international importance.

A severe drought in 1996-7 highlighted the plight of the River Misbourne and was the stimulus for Project's beginnings. The River Misbourne was badly affected, having been in a state of decline since the 1940s. In contrast, the River Chess had reliable flows, was rich in nature and was part of a largely unspoilt landscape. Local people's passion for chalk streams soon gave momentum to the project with the Chiltern Society's Vic Wotton playing a major role in bringing the Misbourne's state to the attention of the responsible authorities.

The idea of bringing together water companies, the regulator and environmentalists may seem incongruous, but the partnership led to an integrated programme of measures to restore and protect both the Misbourne and the Chess and their valley environments. This has since provided a sound basis for work on other rivers – the Project now covers all major Chilterns chalk streams and employed its first Project Officer in 1999.

Over the past 25 years, the Project has made an outstanding contribution to chalk streams conservation and has become the longest running chalk streams project in the country. Work has ranged from enhancing and restoring habitats, to improving public access to the streams. From education projects that engage schools and communities, to landowner advice and river health monitoring schemes. Perhaps most significantly, the Project has supported and enthused local communities to improve and protect their local rivers. This network of committed local river groups plays an essential role in the conservation of these threatened rivers.

Many of the issues facing chalk streams in 1997 are still relevant today and, through increased investment and funding for the Project over the last four years, the team is now seven strong. We see this as a powerful endorsement of the project. We hope that this investment, along with the new National Chalk Streams Strategy, will help chalk streams face their future, increased threats and protect them for future generations to enjoy.

Elaine King
Chief Executive Officer

PROJECT MANAGER'S VIEWPOINT

Allen Beechey
Project Manager
Chilterns Chalk Streams Project

A 25-year anniversary provides an opportunity not only to review achievements and progress, but also to reflect on the role the Project should play in shaping the future for the Chilterns chalk streams.

The longevity of the Project is testament to both its record of delivery and the importance that its partners and local communities have placed in it. The Project has grown from relatively humble beginnings with a focus on access, education and awareness. An early milestone was the employment of a dedicated project officer, enabling the Project to build momentum, and deliver an ever-wider range of work. The Project also worked closely with water companies and the Environment Agency on the investigation of low flows in almost every chalk stream, gaining a detailed understanding of how these enigmatic rivers function and providing valuable insight into the actions needed to keep them flowing into the future. More recently, the Project has had a more strategic role, co-hosting catchment partnerships under Defra's Catchment-based Approach and hosting Thames Water's innovative Smarter Water Catchment initiative for the River Chess.

Underlying the Project's work at all times has been the support of local communities whose passion for their local rivers remains undiminished. It is they who, when the Project's future was under threat, expressed their desire for it to continue and grow to deliver more for chalk streams. Without their support and inspiration, the Project may well have foundered long before now.

The severity of the 2019 drought brought the plight of the Chilterns chalk streams to a wider audience. The Project was a key part of the 'Chalk Streams in Crisis' campaign and the Chalk Rivers Action Group that followed, to demand better protection for these rivers. The crisis was debated in the House of Commons and there was a public protest on the River Ver. The resulting Chalk Streams in Crisis conference achieved collective recognition by key organisations that the condition of the Chilterns' streams was not acceptable and more must be done to reverse their decline. With this fresh mandate, and renewed investment from Affinity Water, Thames Water and the Chilterns Conservation Board, the Project has been able to grow and increase its impact both locally and strategically. As chalk streams face unprecedented pressures, the Project is well-placed to play its part in their recovery.

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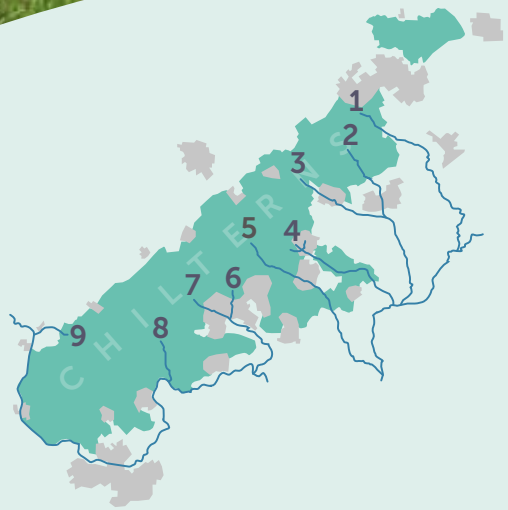


1. RIVER VER
2. RIVER GADE
3. RIVER BULBOURNE
4. RIVER CHESS
5. RIVER MISBOURNE
6. HUGHENDEN STREAM
7. RIVER WYE
8. HAMBLE BROOK
9. EWELME BROOK

Like many chalk streams in England, the Chilterns Chalk Streams are threatened by a combination of issues such as low flows, pollution from agricultural and urban runoff, and by habitat degradation due to human activities such as creating barriers to fish migration, canalisation and over-widening of river channels.

Each of the Chilterns Chalk Streams has its own set of pressures and this report aims to capture the critical issues for each river and highlight progress that has been made over the last 25 years in understanding and mitigating these pressures. The report is also a celebration of the hard work that has been carried out during the Project's lifetime, not only by project staff, but also by the multitude of volunteer groups and non-governmental organisations with which the Project has partnered.

This report is an opportunity to reflect on these different activities and highlight some of the key achievements made over the years, whilst at the same time not shrinking from the fact that these chalk streams and their surrounding landscapes are under tremendous pressure and in need of our continued protection and improvement.

The report has been split into three major components:

- the first section provides an overview of the Chilterns Chalk Streams and the pressures they are under within a national context;
- the second section reviews the many different activities that have taken place under the auspices of the Project;
- the third section reports on the past and current state of the different Chilterns Chalk Streams and sets out the challenges and future vision for the Project.

At the end, we highlight the different ways that you might help us achieve our vision for a healthy Chilterns Chalk Streams environment in the future.

THE REPORT HAS BEEN SPLIT INTO THREE MAJOR COMPONENTS

1

PROVIDES AN OVERVIEW OF THE CHILTERNS CHALK STREAMS AND THE PRESSURES THEY ARE UNDER WITHIN A NATIONAL CONTEXT

Raise awareness of the importance of chalk streams and the need to conserve them

Carry out surveys to assess the quality of wildlife habitats and locate rare species

2

REVIEWS THE MANY DIFFERENT ACTIVITIES THAT HAVE TAKEN PLACE UNDER THE AUSPICES OF THE PROJECT

Provide specialist advice on riverside management

Improve physical access to the streams and provide information about their special qualities

3

REPORTS ON THE PAST AND CURRENT STATE OF THE DIFFERENT CHILTERNS CHALK STREAMS AND SETS OUT THE CHALLENGES AND FUTURE VISION FOR THE PROJECT

Provide education resources for schools to help children understand the chalk stream environment

MILESTONES OF THE FIRST 25 YEARS


Water voles

Our citizen science toolkit includes water vole and non-native invasive species surveying, and riverfly monitoring.


Signal crayfish

Our timeline highlights key milestones delivered by the Chilterns Chalk Streams Project (CCSP) since its creation in 1997. The main driver for the creation of the project was low flows, an issue that remains very relevant today due to excess water abstraction and the effects of climate change on air temperature and rainfall patterns.

Provision of educational resources has been a critical objective throughout the Project's history with the first education pack aimed at Key Stages 2 and 3 created in 2002. The project now supports two Education and Engagement Officers who help school children understand the chalk stream environment through initiatives such as 'Trout in the Classroom'. The Project has also developed and maintains a series of riverside walks with associated interpretation and walk leaflets.

Our latest innovations involve the creation of interactive online Storymaps for adults and children to help raise awareness of chalk stream functioning, to showcase the important qualities of our different chalk streams and to highlight the need for conservation efforts.

Surveys to assess the quality of wildlife habitats provide critical data to guide our management plans and actions. These survey techniques would not be possible without the amazing efforts of our volunteers, alongside our collaborations with local river organisations. In the last three years, we have added Citizen Science endeavours to our list of activities; including water quality assessments and habitat monitoring.

Throughout its history, the Project has provided management advice to community groups, and organised practical conservation activities designed to improve habitat. In this way, we have helped local groups achieve their aspirations to improve their local river environment. Habitat enhancement classes, and the design and implementation of river restoration projects continue to be regular activities. Our best practice in this area has been recognised by the Wild Trout Trust and Association of AONBs, with awards in 2009 and 2013 for the Meades Water Garden Restoration on the River Chess, and for wider practical activities, respectively.

THE TIMELINE ALSO SHOWS HOW THE CCSP HAS BENEFITTED FROM SUCCESS WITH GRANT APPLICATIONS, PARTICULARLY OVER THE LAST FIVE YEARS.

THIS ADDITIONAL INCOME HAS ENABLED NEW STAFF TO BE RECRUITED, AND A WIDER RANGE OF ACTIVITIES TO BE UNDERTAKEN THAN EVER BEFORE.

SECTIONS TWO AND THREE OF THE REPORT SHOWCASE SOME OF THE HIGHLIGHTS ASSOCIATED WITH 'WATER IN A DRY LANDSCAPE', 'SMARTER WATER CATCHMENTS' AND THE 'CHALK STREAMS AND WETLAND MEADOWS' PROJECTS.

MILESTONES OF THE FIRST 25 YEARS

1997
Chilterns Chalk Streams Project commences

1999
First Project Officer employed

2009
Trout in the Classroom Project starts

2010
First riverfly groups set up in the Chilterns

2012
Habitat enhancement masterclasses initiated

2013
CCSP awarded Bowland Award from National Association of AONBs

Chilterns, Herts & Middx Riverfly Hub established

2014
Colne Catchment Action Network (co-hosted by CCSP and Groundwork South) launch interactive plan for the River Colne

2016
Enhancement of Wye in Wycombe Town Centre completed

2001

First water vole Survey

2002

Production of interpretation boards and walk leaflets for Chilterns streams underway

2003

Chilterns Water Festival held for first time

First Education Pack launched for schools

2008

Award-winning Meades Water Gardens Restoration Project completed

2007

First survey of non-native invasive plants

Revive the Wye Initiative launched

2006

River restoration projects underway

2018

First Education and Engagement Officer role is created

'Water in a Dry Landscape' commences

First ColneCAN annual conference

2019

ChessWatch project launched – first continuous measurements of water quality in a Chilterns chalk stream

2021

A new River Officer and a second Education and Engagement Officer join the team

Chess 'Smarter Water Catchments' Partnership begins

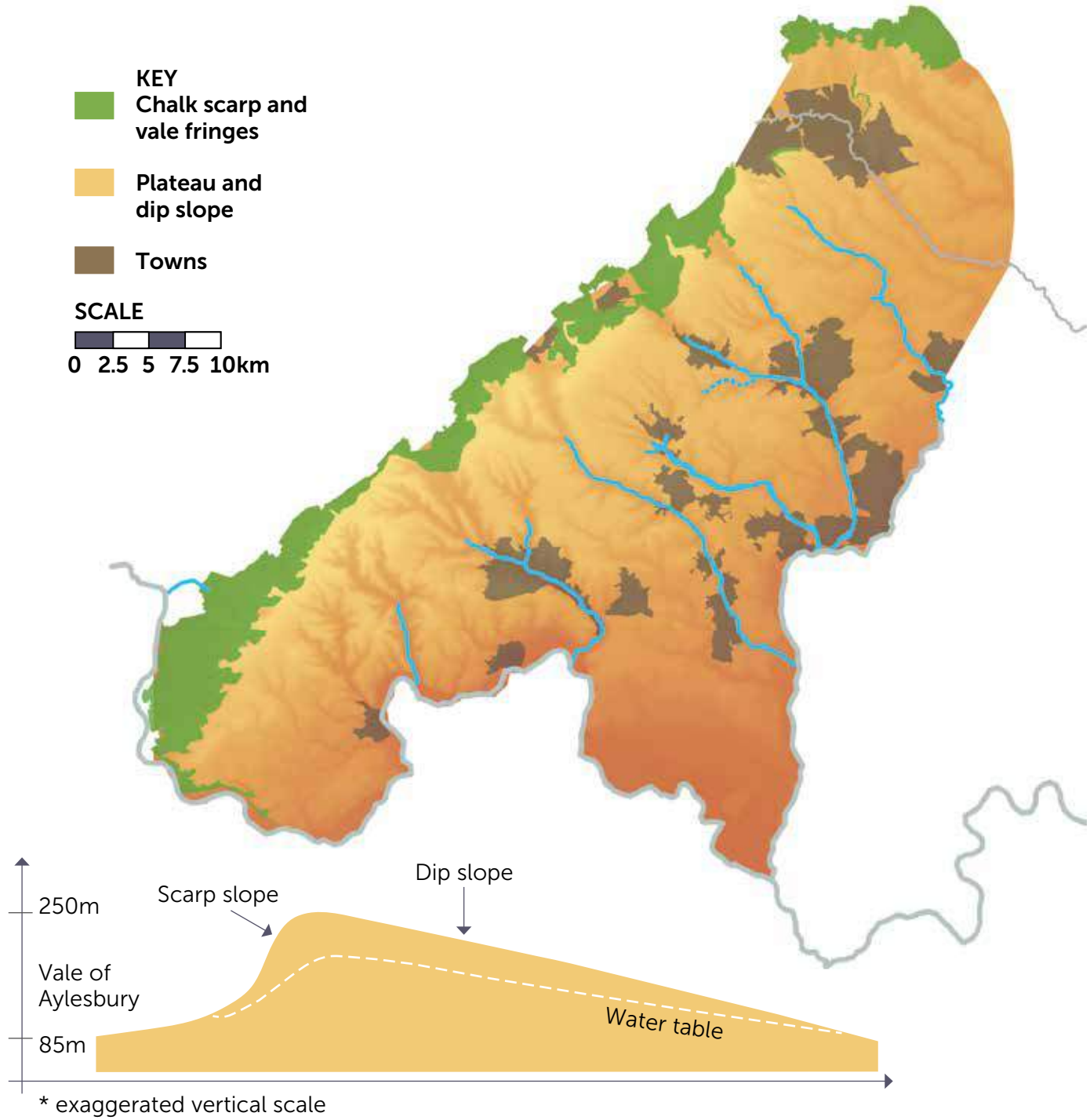
GEOGRAPHICAL COVERAGE

Chalk streams are a key feature of the Chilterns AONB landscape, with a total length of approximately 150 km. They are important habitats for wildlife, supporting a massive range of plants and animals and are home to some of the AONB's most threatened species including otter, water vole and brown trout.

Eight major chalk streams have their source within the Chilterns Area of Outstanding Natural Beauty, flowing south-eastwards down the dip slope of the chalk escarpment. The Hughenden Stream, River Wye and Hamble Brook flow directly into the River Thames, whilst the River Ver, River Gade, River Bulbourne, River Chess, and River Misbourne flow into the River Colne and then into the River Thames.

In addition, there are many (c. 20) small streams that rise from springs along the base of the scarp slope from the Ewelme Brook near Wallingford in the south to the Barton and Burwell springs, north of Luton. The Ewelme Brook flows directly into the River Thames, whilst the other streams flow north into the River Thame through a predominantly dry landscape. Until recently, little was known about the biodiversity value or influence of these tributaries on the River Thame. The partnership project 'Water in a Dry Landscape' is providing new insights into the water quality and habitat of these streams. (See page 50 for further details).

Chalk Streams also have a fascinating history having been used as a natural resource for many thousands of years. The valleys through which they flow have supported agriculture, settlement and recreation, and they have been shaped and changed by that relationship with humans.



The chalk of the Chilterns started to form around 145 million years ago during the Cretaceous period from the remains of tiny calcareous marine organisms (plankton) settling to the bottom of a shallow sub-tropical sea.

The chalk layers that comprise the former seabed have been tilted by tectonic forces to create a dip slope that falls to the south-east and a steep escarpment (or scarp slope) to the north-west. Erosion by wind, rain and ice has created the Chiltern Hills that you see today.

CULTURAL OVERVIEW OF CHILTERNS CHALK STREAMS

Humans have been drawn to flowing water from the very earliest times, and the chalk streams and springs of the Chiltern Hills are no exception. The focus of human activity and modification for millennia, one could say that the chalk streams are archaeological features in their own right. For them to have a future, we must also better understand the past, and the legacy left by the interaction of people and chalk streams over thousands of years.

The first post-glacial (c.10 – 11k years ago) human occupation of the Chilterns would have been by hunter-gatherer bands who were attracted by the reliable sources of aquifer-fed water, as well as the abundant game which would have gathered. Flint extracted from the chalk was also a desirable resource for the crafting of tools and weapons. For several thousand years, the valleys would have been well travelled and home to seasonal camps.

By 5000 years ago, farming was well established, with different requirements placed on both the land and the chalk streams. In this Neolithic period, many earth and timber monuments were constructed, often with reference to springs (Walaud's Bank, Luton at the source of the Lea, for example). By the Late Bronze Age and into the Iron Age (between 3200-2200 years ago) some of these locations became the sites of hillforts, large earthwork enclosures which served many functions, but seem to be deliberately positioned in this landscape with regard to chalk streams and springs.

As populations grew, and technological advances such as the adoption of metalworking allowed for increased efficiency in land exploitation, permanent settlements began to emerge in the Chilterns, and these were clustered around the chalk streams. The major towns we see today are built upon the foundations of earlier activity, inextricably linked with the presence of the waterways.

Left: Lord's Mill, Chesham as illustrated on an early 20th century postcard, pre-1907.

Right: Reconstruction of an Iron Age hillfort at West Wycombe overlooking the River Wye. A second hillfort, Desborough Castle, is visible on the far side of the valley. Both hillforts may be visited today, although the Wye is harder to see (artist, Phil Kenning).

Chalk streams have not only been desirable locations for settlement for their supply of drinking water and food resources, but also for their motive power. Industries of all types have thrived over the millennia along the banks of the rivers. Iron smelting in the later prehistoric and Roman periods occurred at places like Cow Roast on the Bulbourne, and a part of the Ver downstream of St Albans (Roman Verulamium), which were navigable by barge, at least in Roman times.

Between that period through to modern times there have been abundant mills (more than 90!) which both written records and archaeological remains attest to, processing a range of materials, from turning grain into flour, rags into paper, and even a brief flirtations with milling silk and, in the 18th century, polishing diamonds! Another major stream-reliant industry was watercress 'farming', which led to the creation of numerous watercress beds along chalk streams throughout the Chilterns. Sadly, these are nearly all out of operation.

Beyond the pragmatic, waterside locations have been used for spiritual and religious activity since prehistoric times. From the Bronze Age burnt mounds on the Chess, to Roman shrines and temples on the Ver and Hamble Brook, and the subsequent relationships between Saxon and Medieval churches at 'holy wells' and near the rivers, we can see people are drawn to ritual behaviour near water – even today, we ourselves follow suit. People of many different faiths are still placing items of personal and religious significance in chalk streams.

The narrative of humans in the Chilterns and the biography of our chalk streams are as inter-braided as a prehistoric river channel. Today, we are at the next chapter in this long story, and the CCSP has been instrumental in not only enriching the tale but working toward the story having a happy ending for our rivers, and by extension, those who connect with them.

Left: Netting the River Gade to harvest cropped watercress near Cassiobury House (demolished 1927) (© Carole Maddison).

Right: 1935 entry into the Lord Mayor's Show highlighting the importance of chalk stream industry (© Croxley Green History Project).

CURRENT AND LEGACY THREATS

The Chilterns area has some of the highest per capita demand for domestic water in the UK

173 litres of water per person per day

compared to a national average of

142 litres of water per person per day

and environmentally unsustainable abstraction has persisted in some areas of the Chilterns for over 50 years.

The Chilterns Chalk Streams are under threat from a range of issues – sometimes referred to as the 'chalk streams malaise'. A useful starting point to examine some of the issues facing chalk streams is the European Union Water Framework Directive (WFD), which requires English rivers to meet 'Good Ecological Status' by 2027 at the latest. All the streams failed to reach 'Good Chemical Status' under the 2019 Water Framework Directive analysis, and only the Ewelme Brook and the Hughenden Stream were considered to have a hydrological regime that could support 'Good Ecological Status'. All of the streams failed to reach 'Good Chemical Status' due to the variety of issues listed in the table on page 15.

This combination of abstraction for public supply, coupled with high water demand, has led to a chronic decline in flows in all of the Chilterns' streams, with winterbourne sections increasing in length and in frequency of drying. Increasing water demand and climate change are placing additional pressure on river flows. Under the current water industry national environment programme (WINEP), Affinity Water has embarked on a 36 million litre reduction in abstraction, and Thames Water has committed to a 9 million litre reduction in the Chilterns by March 2025.

The table on page 15 highlights some of the threats to our chalk streams arising from current and past use of chemicals in our homes and for industrial purposes. Elevated mercury levels are a legacy of past industrial activity. Perfluorooctane sulfonate (PFAS) and polybrominated diphenyl ethers (PBDEs) are regularly detected in rivers across England. PFAS was used in the past on textiles to repel water and reduce stains. Similarly, PBDE is a 'legacy' chemical which was used as a flame retardant in a variety of products, including textiles. Although these chemicals are now banned, they are persistent in the environment and can travel through wastewater treatment works and out to our rivers, due to the washing of treated carpets, textiles and upholstery in our homes. Polyaromatic hydrocarbons (PAHs) are the products of fossil fuel combustion, and much of the load in our rivers is also derived from past human activity. Domestic wood burning, and petrol and diesel-powered vehicles, are both current sources of PAHs to rivers.

The reasons for these chemical failures are examined further in the pages that describe the Bulbourne, Gade and Ewelme Brook respectively.

Water Framework Directive assessment of Chilterns Chalk Streams (2019)

River	Ecological	Chemical (overall)	Specific chemicals	Hydrological regime	Morphology
Bulbourne	Poor	Fail	PBDE, PFOS, Dissolved oxygen (moderate)	Does not support good	Supports good
Chess	Moderate	Fail	PBDE, Phosphate (poor)	Does not support good	Supports good
Ewelme Brook	Moderate	Fail	Hg, PBDE,PFOS, cypermethrin Phosphate (moderate)	High	Supports good
Gade (upper)	Poor	Fail	PBDE, Dissolved oxygen (moderate)	Does not support good	Supports good
Gade (lower)	Moderate	Fail	PBDE, PFOS, Phosphate (moderate)	Does not support good	Supports good
Hamble Brook	Poor	Fail	Hg, PBDE,PFOS,	Does not support good	Supports good
Hughenden Stream	Moderate	Fail	Hg, PBDE	High	Supports good
Misbourne	Moderate	Fail	PBDE	Does not support good	Supports good
Ver	Moderate	Fail	PAHs, PFOS, PBDE Dissolved oxygen (moderate)	Does not support good	Supports good
Wye (upper)	Moderate	Fail	PAHs, Hg, PBDE	Supports good	Supports good
Wye (lower	Poor	Fail	PAHs, Hg, PBDE, PFOS	Supports good	Supports good

KEY
- Poor
- Moderate
- Fail
- Does not support good
- High
- Supports good

Moderate and poor dissolved oxygen concentrations in chalk streams of the Chilterns, alongside elevated phosphate and cypermethrin concentrations are all caused by recent activities in the different river catchments.

LOW FLOW: RIVER VER CASE STUDY

Many of the Chilterns Chalk Streams suffer from low flows and are designated as over-abstracted by the Environment Agency. Here, John Pritchard, Chairman of the Ver Valley Society, illustrates the scale of the issue, using the River Ver as an example.

A lack of flow is one of the key issues faced by the River Ver, much more regularly now than in the past. It's no coincidence that the river was among the first to experience unsustainable levels of abstraction in its valley, in this case to serve the growing new town of Luton. Today, the Ver remains one of the first chalk streams to experience low flows and dry stretches in periods of low rainfall or extended hot weather. It is undoubtedly the canary in the coal mine, giving an early indication of what many other chalk streams might expect.

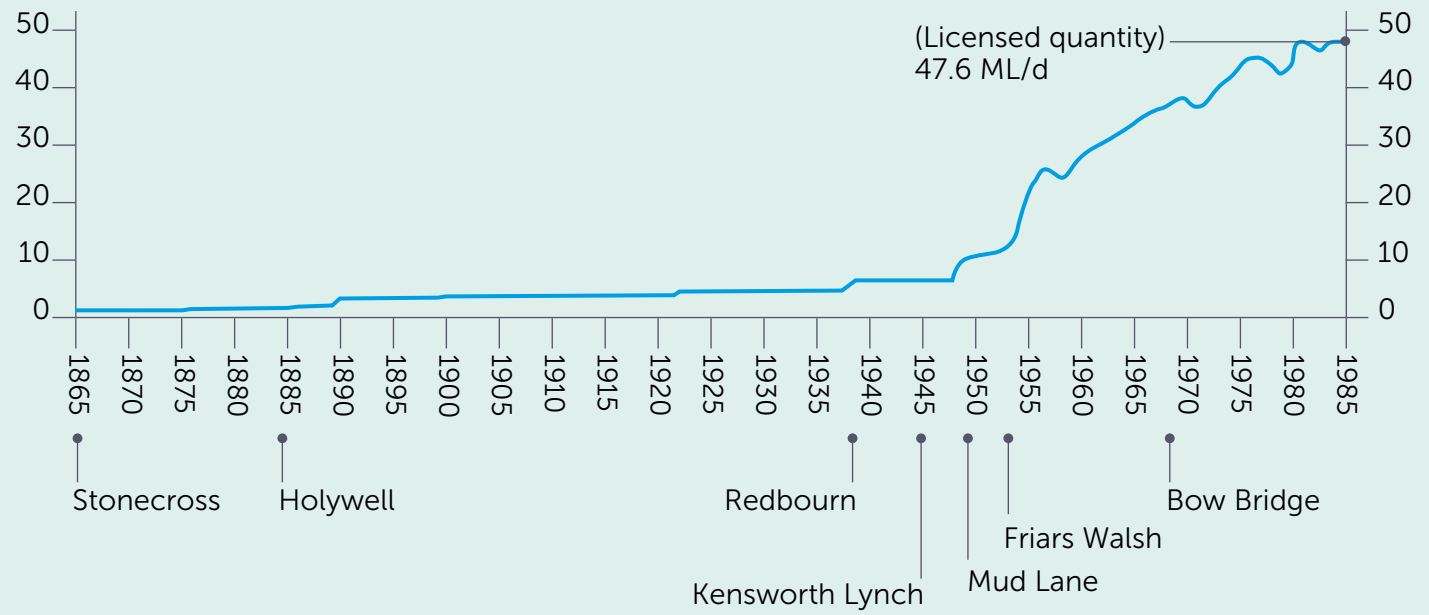
When abstraction of the chalk groundwater was at its height, nearly 50 million litres a day were taken for public water supply – about 50% of the effective rainfall the catchment receives in an average year. Most would agree that 10% is the maximum amount a chalk stream catchment can sustain without inflicting environmental damage. The river was the subject of the Alleviation of Low Flows (ALF) initiative in the 1980s after the river dried, but despite some abstraction reductions, it has yet to regain its former character. Indeed, the Environment Agency's Environmental Flow Indicator (EFI) estimates that the Ver has a deficit of 24 million litres a day.

The perennial head of the river has moved downstream about 5km (Markyate to Redbourn) in the past 70 years, while in that time abstraction has increased substantially. Rainfall patterns have remained largely the same. The result is a slow, silty river for much of the time – lacking the healthy biodiversity that might be expected in a chalk stream.

The Ver Valley Society has members who can remember the tresses of water crowfoot billowing in the almost gradient-less Abbey Mill Stream in Verulamium Park – the strength of flow alone encouraging this keystone species to thrive.

Ver masterclass in river restoration, 2013

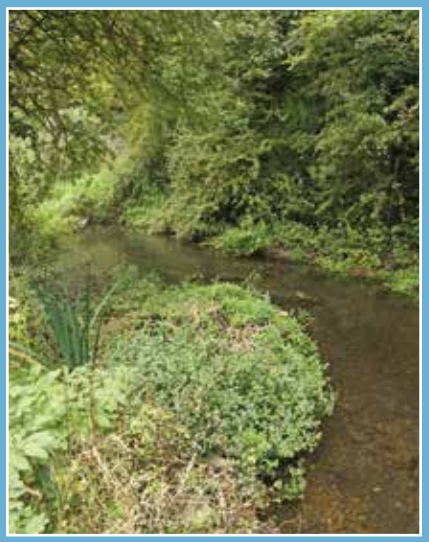
Abstraction in the Ver Valley (million litres per day)



Sir William Halcrow & Partners: Study of Alleviation of Low Flows Resulting from Groundwater Abstraction, Ver Case Study 1988

"It was deep and fast flowing with banks of water weed swaying in the current above the gravel riverbed. We saw minnows, shoals of roach, trout and little pike."
Christopher Chapman writing of the 1950s

The Ver is just one of the many rivers that are suffering a similar fate. Our unique chalk streams and priceless wetlands are disappearing, with most citizens unaware of the consequences of their thirst for water, as the aquifers are drained of their water. Clearly, we all have a part to play in rectifying the situation. We are looking to the Government, however, to direct water companies to do more: to enforce existing legislation, to play a more active role in encouraging consumers to use less and to set the tone that water is a precious commodity to be used sparingly.



A sinuous channel arising from the Ver masterclass one year on, 2014

THE CHANGING NATIONAL CONTEXT OVER 25 YEARS OF THE CCSP

Chalk streams have long been recognised as an iconic river type in England, and their international importance was acknowledged by policymakers in 1992 when chalk streams were recognised as priority habitats under the Biodiversity Action Plans (BAP) which arose from the Rio Earth Summit.

A Chalk Stream Summit was organised in 2012 by the Angling Trust and Salmon and Trout Association to discuss the plight of chalk streams and build on the campaigning work carried out by multiple different organisations. As a follow up, the 'Charter for Chalk Streams' was launched in 2013 with the support of

KEY NATIONAL INITIATIVES WHICH HAVE TAKEN PLACE DURING THE 25 YEARS OF THE PROJECT

1996

CHALK STREAMS GIVEN PRIORITY HABITAT STATUS UNDER THE UK BIODIVERSITY ACTION PLAN

2000

CHALK STREAMS EU WATER FRAME-WORK DIRECTIVE (WFD) IS ADOPTED

2004

UK BIODIVERSITY ACTION PLAN STEERING GROUP PRODUCES *THE STATE OF ENGLAND'S CHALK RIVERS*

2007

CHALK STREAMS BECOME A SUBSET OF BROAD 'RIVERS' UK BAP PRIORITY HABITATS

2011

PUBLICATION OF GOVERNMENT WHITE PAPER 'WATER FOR LIFE'

WWF-UK, The Wildlife Trusts, The Rivers Trusts and other groups including the Chilterns Chalk Streams Project and the River Chess Association. Amongst other measures, the Charter called for abstraction reform and greater use of reservoir storage for winter runoff. The Charter recognised the particular threat to the undesignated streams of the Chilterns arising from over half a century of over-abstraction, and recommended that the Chilterns be the focus of a government pilot to restore specific rivers to good ecological health.

There have been multiple assessments of the issues over the last 25 years but little by way of robust strategy. Throughout this period the Chilterns Chalk Streams Project has been calling for:

- Special status for chalk streams
- The need for Ofwat, the Water Services Regulation Authority, to consider the environment in its decision-making
- Action on over-abstraction

Bulbourne, Sheldon Way, Berkhamsted

2012

CHALK STREAMS SUMMIT IS ORGANISED BY ANGLING TRUST AND THE SALMON AND TROUT ASSOCIATION

2013

CHARTER FOR CHALK STREAMS IS LAUNCHED FOLLOWING THE SUMMIT

2014

THE STATE OF ENGLAND'S CHALK STREAMS IS PUBLISHED BY WWF

2019

CHALK STREAMS IN CRISIS IS PRODUCED BY MARTIN SALTER AND STUART SINGLETON-WHITE

2020

CHALK STREAMS FIRST IS PUBLISHED

2021

CABA CHALK STREAMS RESTORATION STRATEGY 2021 IS PUBLISHED

The last five years have seen multiple calls for action, perhaps reflecting the increasing urgency of the situation in light of the climate change emergency. Additionally, the COVID-19 lockdowns that occurred in 2020 demonstrated the benefits of nature for mental health and wellbeing, highlighting the importance of protecting our natural environment.

Chess at Pednormead End, January 2019

THE CHANGING NATIONAL CONTEXT OVER 25 YEARS OF THE CCSP

In 2014, the WWF State of England's Chalk Streams report reviewed the health of England's chalk streams in advance of the statutory River Basin Management Plans (2015), and set out a manifesto to safeguard their future, and restore the streams to good health through reducing abstraction, decreasing pollution, reviving natural river processes and habitat, and promoting better river management.

The report showed that more than three-quarters of chalk streams were failing to meet 'Good Ecological Status' under the Water Framework Directive assessment.

In 2019 the Chilterns Chalk Streams Project, together with River Chess Association and Ver Valley Society, contributed to the 'Chalk Streams in Crisis' report in response to the drought conditions and depleted flows in chalk streams at that time. The dossier emphasised the consequences of three consecutive years with lower than average rainfall and presented the situation in the Rivers Chess and Ver, amongst others, as case studies.

In 2020, 'Chalk Streams First', a proposal to re-naturalise flows in the Chilterns chalk streams, was published by a coalition of The Rivers Trust, The Angling Trust, WWF UK, The Wild Trout Trust and Salmon and Trout Conservation. The scheme proposes that Affinity Water's Supply 2040 plans are brought forward to 2030 to enable public water supply to the Chilterns from the lower River Thames and Lea in London rather than from groundwater abstraction in the headwaters of the Rivers Colne and Lea.

The most recent call to arms is the 'Chalk Stream Restoration Strategy 2021', written and collated by Charles Rangeley-Wilson of the Catchment Based Approach Chalk Stream Restoration Group. This report advocates addressing flow, water quality and habitat together to restore England's chalk streams, and repeats the calls for a powerful statutory driver in the form of enhanced status for all chalk streams.

By September 2019 67% of the total length of chalk stream habitat in the Chilterns AONB was dry

'Chalk Streams in Crisis' highlighted the drying up of multiple Chilterns Chalk Streams as a result of below average rainfall in 2018/2019, combined with over-abstraction. The Chess and Ver were featured in the report, and other rivers, such as the River Gade (pictured), also suffered from a lack of flow in their headwaters at this time.

CELEBRATING 25 YEARS OF IMPACT

HERE WE DESCRIBE OUR KEY ACTIVITIES OVER THE 25 YEARS OF THE PROJECT. THE FOLLOWING PAGES PRESENT THESE ACTIVITIES IN FURTHER DETAIL.

Raising awareness of the need for conservation
Raising awareness at local fetes and fairs is an important component of the CCSP's work. Over the years, annual forums have been held throughout the Chilterns, and most recently the ColneCAN conferences have helped communicate the need for conservation of our chalk streams.

Providing management advice
The Project team works with local rivers groups and with landowners to provide both riparian and in-channel management advice. Tree management, such as pollarding and coppicing to let in more light to the channel, were regular activities early in the Project's history. Habitat enhancement workshops are organised to teach local rivers groups new skills, such as creating deflectors to improve flow diversity for invertebrates and fish.

Surveying wildlife and habitat
The action plans for our rivers are informed by data. Surveying wildlife and habitat in our precious chalk streams has been a critical component of the Chilterns Chalk Streams Project since 2001. Training riverfly volunteers and carrying out water vole surveys have been regular activities throughout the Project's history.

Providing educational resources for schools
The CCSP has worked with local schools since its inception. A schools education pack was launched at the Chilterns Water Festival in 2002 for Key Stages 2 and 3 supported by teacher training activities. Trout in the Classroom was piloted in 2009 and remains an important part of the Project's school education programme.

Improving access and habitat
The Project has been involved in the delivery of more than 40 habitat enhancement schemes across the Chilterns dip slope streams and in 2008 and 2009, the Project and its partners, won several coveted awards for the Meades Water Gardens Restoration Project in Chesham. In 2013, the CCSP won the Bowland Award for outstanding contribution to the conservation of an AONB.

RAISING AWARENESS OF THE NEED FOR CONSERVATION

PROVIDING MANAGEMENT ADVICE

PROVIDING EDUCATIONAL RESOURCES FOR SCHOOLS

IMPROVING ACCESS AND HABITAT

SURVEYING WILDLIFE AND HABITAT

RIVERFLY MONITORING

Regular monitoring is the best way of identifying river pollution incidents at an early stage, and to enable a rapid response to identify the source and carry out remedial action.

The Anglers' Riverfly Monitoring Initiative (ARMI) was launched by the Riverfly Partnership in 2007 to enable anglers, environmentalists and community groups to monitor and protect their local rivers. It helps rivers to be monitored more widely and at greater frequency than is possible by the Environment Agency alone.

The ARMI monitoring technique involves pairs of volunteers taking samples from the riverbed each month and recording the presence and abundance of eight pollution-sensitive invertebrate groups. If invertebrate numbers drop below expected levels, the Environment Agency are informed so that they can take action.

ARMI is used widely across the UK as a 'neighbourhood watch' for rivers. The regular presence of volunteer monitors on rivers can discourage potential polluters and their data can be used to help secure prosecutions by the statutory authorities. The datasets collated by ARMI groups can also allow long-term changes in river health to be identified and the success of river restoration schemes to be monitored.

The first ARMI group in the Chilterns was set up on the River Chess by the CCSP and the River Chess Association in 2010. The following year the Project helped Misbourne River Action establish a group on the Misbourne, and the Ver Valley Society to set up another in 2012. The Project worked with the Hertfordshire and Middlesex Wildlife Trust to set up the Chilterns, Hertfordshire & Middlesex (CHM) Riverfly Hub in 2014. The Hub provides training and equipment to enable volunteers to monitor rivers across the Lea, Colne and South Chilterns catchments. To date, the Hub has trained over 250 volunteers and supports ARMI groups on 16 of the Hub's rivers, including eight out of the nine Chilterns chalk streams.

The CHM Riverfly hub is a highly successful partnership initiative that has developed a network of motivated and skilled volunteers collecting vitally important data. It has helped to raise awareness of the condition of rivers in the area and acted as a catalyst for new citizen science initiatives that are further increasing our understanding of their health.

RIVER RESTORATION

Over the years, the Chilterns Chalk Streams Project has worked with local groups on numerous river restoration schemes. Here we highlight two award-winning ventures on the Chess and Bulbourne respectively:

Meades Water Gardens, River Chess (images above)
Meades Water Gardens was originally a formal water garden comprising two ornamental ponds with weirs created in the 1970s, built on the site of a former watercress bed and mill pond. However, the ponds slowed water flow, and silt rapidly accumulated in the ponds as a result, decreasing their wildlife and aesthetic value. The gardens were also permanently in shade from tall trees, and the focus of anti-social behaviour. Over-shading prevents the growth of the in-stream vegetation that is an important defining characteristic of chalk stream environments. The Chilterns Chalk Streams Project led a restoration scheme with the Impress the Chess project between 2007 and 2008 to remove the weirs, narrow the channel and thin out the trees. The scheme won the Wild Trout Trust Conservation Award in 2009, and the 'Environment and Culture Award' in the SE England Market Towns Awards 2008.

Bringing Back the Bulbourne
Between 2014 and 2017, CCSP worked in partnership with the Box Moor Trust, Environment Agency (EA) and Wild Trout Trust (WTT) to restore a 1km section of the River Bulbourne at Box Moor near Hemel Hempstead. Historic modification had resulted in an over-widened, impounded and straightened river channel that was unable to support the diversity of wildlife typically found in chalk streams. Originally proposed by the Chilterns Chalk Streams Project in 2010, the multi-phased project began with a series of volunteer habitat enhancement work parties, followed by the removal of a weir in 2016, to facilitate fish passage and to re-energise flows. The second and largest phase of the Project, carried out by the EA, involved the creation of a narrower, more sinuous channel as well as backwaters, wetland scrapes and a kingfisher nest bank. Two fords and public access points were created and the reach was fenced by the Trust to protect the banks and enable marginal vegetation to develop. The project received several awards including 'Best medium scale habitat enhancement scheme' at the 2017 WTT Conservation Awards.

BULBOURNE

TACKLING INVASIVE NON-NATIVE SPECIES

Britain is home to over
3,000
non-native species.
That figure is currently increasing by 10 – 12 new species every year.

According to the 'The Great Britain Non-Native Species Strategy' published by Defra in 2015, about
10 – 15%
of non-native species established in Great Britain cause significant adverse impacts.

Invasive non-native species (INNS) are defined as species which have been introduced to areas outside their natural range through human action, and are posing a threat to native organisms or environments, or have other unforeseen impacts.

Aquatic species tend to be more invasive than terrestrial ones, and animals more invasive than plants. Of the total number of non-native species that are established, 155 are considered to be invasive in terrestrial or freshwater habitats.

The impacts of INNS can be wide ranging and profound and include:

Environmental: Disrupting habitats and ecosystems, preying on or out-competing native species, spreading disease, and interfering with the genetic integrity of native species.

Economic: The cost of INNS in Great Britain is at least £1.7 billion per year. Much of this cost is borne by the agriculture and horticulture sector, but many other sectors, including transport, construction, aquaculture, recreation and utilities, are also affected.

Social: Some species cause problems to human health or are a nuisance to landowners. For example, invasive plants clog water bodies, preventing access for navigation and angling.

INNS that are affecting Chilterns chalk streams include: Himalayan balsam, Japanese knotweed, giant hogweed, Australian swamp stonecrop, floating pennywort, North American mink and signal crayfish.

The impacts of INNS mean it is vital to control their spread and, if possible, eradicate them when they are found. The CCSP is working with partner organisations and local river groups to control INNS.

Japanese knotweed

WATER VOLE SURVEYS

Water voles, (*Arvicola amphibius*), are Britain's fastest-declining mammal, and water vole populations have decreased by 97% since the 1970s. The decline was initially due to river engineering that encouraged canalisation of our rivers systems alongside intensification of agriculture. Then in the 1980s the introduction of American mink, voracious predators of water vole, caused a rapid drop in numbers.

The Chilterns Chalk Streams Project works in partnership with our local Wildlife Trusts – Bucks, Berks and Oxon Wildlife Trust (BBOWT) and Herts and Middlesex Wildlife Trust (HMWT) – to highlight the plight of water voles in the Chilterns, to help and encourage landowners manage riparian areas and create suitable water vole habitat, and to control American mink numbers.

The River Chess supports one of the two remaining populations of water vole in Buckinghamshire and the last remaining population in the Chilterns AONB. Movement of mink into the River Chess in the early 2000s caused a 97% drop in numbers between 2001 and 2003, which prompted a habitat improvements and mink trapping recovery scheme led by BBOWT. Since 2004, the Chilterns Chalk Streams Project and BBOWT have carried out a biennial survey programme on the Chess, and in 2013 the River Chess Association joined the effort. The latest survey results from 2021 show a stable population of water vole (over 300 animals) on the Chess with a short-term increase in numbers. The Chess is a Local Key Area for water vole; where activities include surveying and monitoring, the co-ordination of mink control and provision of habitat management and enhancement advice. The success over the last 19 years has been largely a result of the long-term commitment and support of landowners and local volunteers.

The River Misbourne has also been a local Key Area for water voles since 2010 in response to sightings in the lower catchment in 2008. A survey in 2009 by BBOWT and the Chilterns Chalk Streams Project confirmed the presence of a significant colony. It is hoped that habitat improvement projects on the Misbourne will help water vole numbers increase and spread downstream and along the River Colne.

Other local groups are leading the re-introduction of water voles to the Chilterns Chalk Streams:

Water voles were last seen on the Ver in 1987, but 150 water voles were released on the River Ver in Summer 2021 by the Ver Valley Society and the Environment Agency, and their numbers are being closely monitored.

The Box Moor Trust, with the help of Herts and Middlesex Wildlife Trust, introduced 177 water voles to the River Bulbourne and local canal in September 2019. They had been absent from the Bulbourne for over 30 years!

TROUT IN THE CLASSROOM

Royal Masonic School in Rickmansworth have signed up for citizen science activities next year.

Our flagship 'Trout in the Classroom' education programme has now been running for over ten years in conjunction with the River Chess Association.

Participating schools are given an aquarium containing brown trout eggs. They follow the life cycle from eggs to alevin to fry, before releasing the trout into their local river. In addition to support with caring for the fish, we also provide a series of lessons so pupils can learn more about the local chalk stream and how their actions have an impact on it.

2022 was our busiest year yet, with ten schools on three rivers taking part. The children produced some fantastic work – from writing their own trout books to creating chalk stream artwork. One school was even inspired to create a chalk stream themed float for their local carnival!

Feedback from teachers has been very positive
'Over these short months, you have both truly sparked an enthusiasm for our local environment amongst the children. We have loved looking after (doing our best) for the brown trout and I hope this will be a project we can continue for years to come.' S. Williams, Sarratt School

The programme remains popular, with a waiting list to take part. It acts as a great engagement tool with schools. A number of those who have taken part are now seeking to get more involved – Millbrook School, High Wycombe plan to organise a river litter pick.

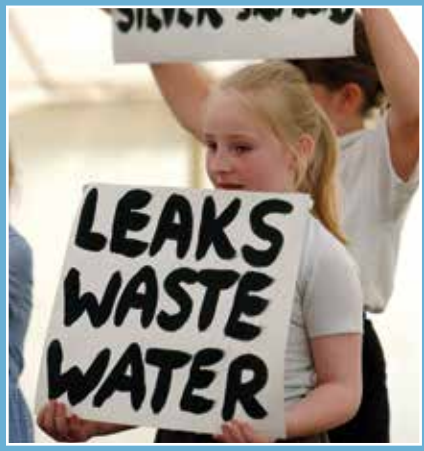
FESTIVALS, FAMILY EVENTS AND CONFERENCES

The first Chilterns Water Festival was held on 22 June 2002 and was attended by 2,500 people, including 300 school children. Following the success of the event, annual Family Water Events were held on the Wye until 2007. Over the next few years, these events morphed into Family Fun Days at Hughenden Manor with dragonfly making and stream dipping activities.

The Annual Chalk Streams Forum was the main mechanism for disseminating project milestones and celebrating project activities from 2003 until 2015. Over the years, the Forums were held throughout the Chilterns: at Henley and Hambleden in the Hambleden Valley, Berkhamsted and Box Moor on the Bulbourne, at Latimer on the Chess, on the Rye in High Wycombe and at Wooburn Green in the Wye Valley, at Benson to celebrate the Ewelme Brook, and at the Maltings Theatre in St. Albans to showcase the River Ver.

In 2018, on joining the ColneCAN partnership, CCSP co-hosted the first ColneCAN annual conference. The second annual conference in 2019 showcased latest projects from the Colne catchment, including the Chalk Streams in Crisis initiative and a water observatory for the River Chess. In 2022, the third ColneCAN conference took place at Latimer Place on the River Chess and was a welcome and engaging in-person event after a prolonged period of online-only activities due to Covid.

Recently, the results of our work have been showcased at wider conferences such as the European Geosciences Union and British Ecological Society for scientists, and the Geographical Association annual teachers' conference.



The first Chilterns Water Festival was held on 22 June 2002 and was attended by 2,500 people, including 300 school children.

WORKING WITH LOCAL RIVERS GROUPS

We have been delighted to encourage and support Laura on educational visits to the schools of St Albans. And we are looking forward to the 2022/3 season of practical work led by Allen, including replacing the Drop Lane structures with large woody debris and improving the chalk stream characteristics at St Michael's ford.

Helping local river groups by providing river management advice, organising surveying activities to inform river management, and raising awareness through education, are all core activities to achieve our mission. Here, by way of example, John Pritchard (Chairman of the Ver Valley Society) provides some highlights of partnership working with the Chilterns Chalk Streams Project on the River Ver.

Drop Lane Restoration Work

In the 1970s, around 2km of the Ver was moved to a continuous straight channel to facilitate gravel extraction from the original river course and surrounding farmland. The locals recounted that 'the water became orange and a thick layer of orange sand was deposited on the bottom of the river, with the result that aquatic life, both animal and plant, quickly disappeared.'

In 2013, the Ver Valley Society's volunteers were pleased to provide much of the labour to implement improvements masterminded by Allen Beechey of the Chilterns Chalk Streams Project, with additional guidance from the Wild Trout Trust.

A key technique of the day was to build woody berms to narrow the channel, introduce some meandering and improve marginal cover for fish and invertebrates. A number of flow deflectors were also staked in place to encourage clean gravel and flow diversification, all to the benefit of chalk stream biodiversity.

This project was the Society's first experience of working in-channel with woody materials. It inspired a cohort of volunteers and equipped them with the knowledge and skills to share with newcomers to the group in future years.

ARMI Riverfly monitoring

A continuous thread of contact with the Chilterns Chalk Streams Partnership has been the training of our changing group of nearly 20 regular Riverfly monitors. The courses and field visits over the last decade to facilitate this have been a notable success.

Project work and school visits

Our relationship with the CCSP continues to grow, strengthened by the mutual support given in 2019 as we watched the Ver and its sister Chiltern chalk streams shrink at a rapid rate.

RIVER BULBOURNE

Dudswell Farm

Canal Fields, Berkhamsted

Restored river at Hardings Moor

The Bourne Gutter only flows when groundwater levels are high

The earliest river flow records from the 1700s suggest that the source of the Bulbourne was near Park Hill on the outskirts of the Bulbourne village, north of the current location marked on Ordnance Survey maps at Cow Roast. Today, flows in the Bulbourne are strongly modified by groundwater abstraction, both for drinking water supply and for the Grand Union Canal. The current source of the river migrates between approximately 13 and 5 km from the confluence with the Gade in response to variations in groundwater levels.

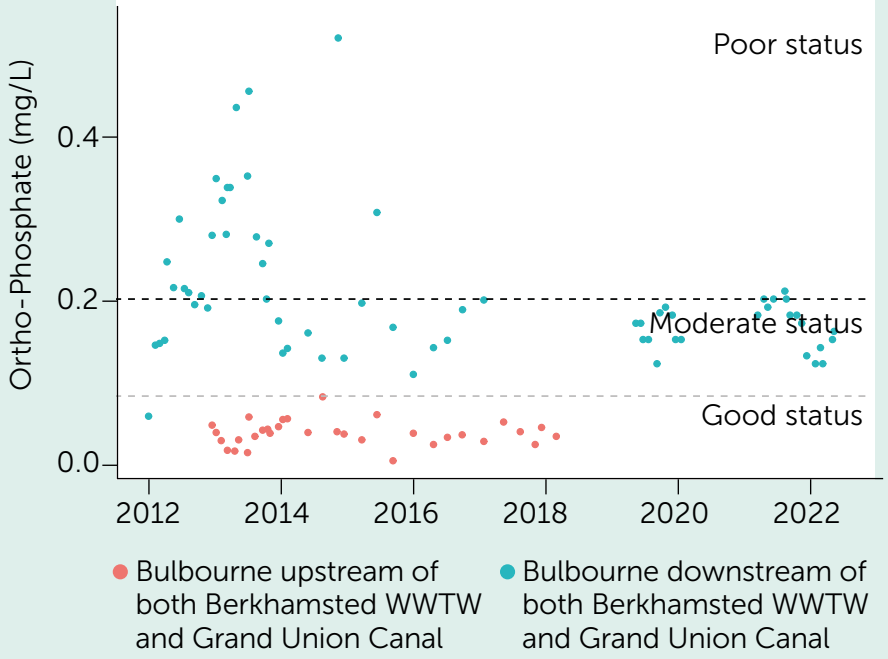
In the urban reaches of the Bulbourne, runoff from road surfaces and verges contributes sediment to the river channel. This sediment builds up within the over-widened river channel, and the low flows lack the power to move this sediment downstream. This combination of sedimentation, over-widened channels and no/low flows contributes to the poor ecological status of the river.

Berkhamsted Wastewater Treatment Works contributes treated effluent to the Grand Union Canal and Bulbourne downstream of Berkhamsted. In 2020 and 2021, when groundwater levels in the catchment were above normal, storm tanks released untreated effluent into the canal and river on numerous occasions. Investigations by Thames Water demonstrated that groundwater infiltration into the sewer network in Berkhamsted was an issue during this period, and a remediation plan is under development.

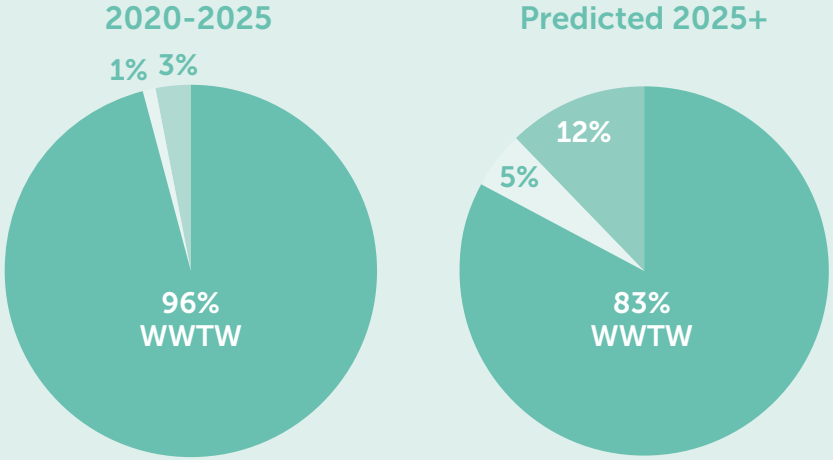
Environment Agency modelling suggests that 96% of phosphorus in the Bulbourne currently arises from wastewater treatment; urban runoff being the second largest contributor. During AMP7 (2020-2025), Thames Water are introducing measures to reduce the concentration of phosphorus in final effluent entering the Bulbourne.

Given the interplay between different issues in the catchment, improving the ecological status of the Bulbourne will require a partnership approach to river management, with close collaboration between the organisations responsible for the road network and local interest groups.

Ortho-phosphate concentration over time



Proportion of Phosphorus in River Bulbourne from different sources

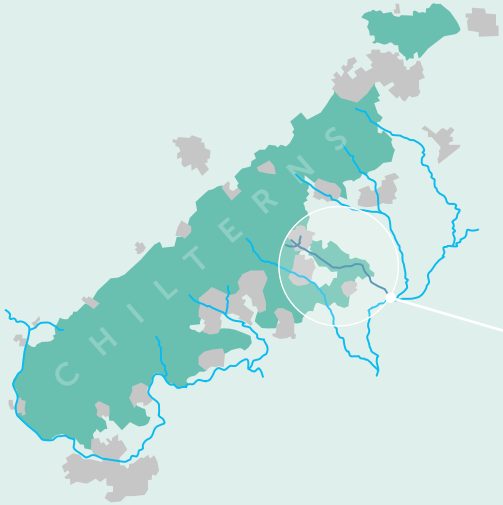


RIVER CHESS

Meades Water Gardens restoration project

KEY

- Environment Agency Gauging Station
- Chesham Wastewater Treatment Works



Chorleywood House Estate

Chesham

1

2

3

Loudwater

4

Rickmansworth

THREATS

- Low flows
- Urban runoff
- Wastewater treatment works
- Channel modifications
- P Phosphorus
- DO Dissolved Oxygen

Carrying out modular river survey, Summer 2022

Water quality sensors recording oxygen levels

River Chess Smarter Water Catchment

The River Chess is currently benefiting from £3 million of funding from Thames Water's Smarter Water Catchments programme (2020-2025). The Chess was chosen as one of three catchments in which to pilot this partnership approach to developing and delivering a catchment management plan.

Thames Water's aspiration is that multiple benefits will spring from an holistic approach to catchment management. The project is split into five themes: managing flows, improving water quality, controlling non-native invasive species, improving wildlife corridors, involving people and working together.

Steph Horn, catchment co-ordinator explains 'Year 1 saw the development and delivery of 'The State of the River Chess', a baseline report to enable the partnership and wider public to understand how things are today on the Chess. In Year 2 we have trained over 40 Citizen Scientists to monitor habitat and water quality from the headwaters of the Chess to the confluence with the Colne. Together we will address data gaps highlighted by the baseline, as well as provide crucial monitoring of our different mitigation actions in the River Chess. Looking ahead, we hope to engage further with local landowners, using seed funding in the form of grants to enable farmers and landowners to deliver projects with multiple benefits for the River Chess and the wider catchment landscape.'

River Chess Pressures

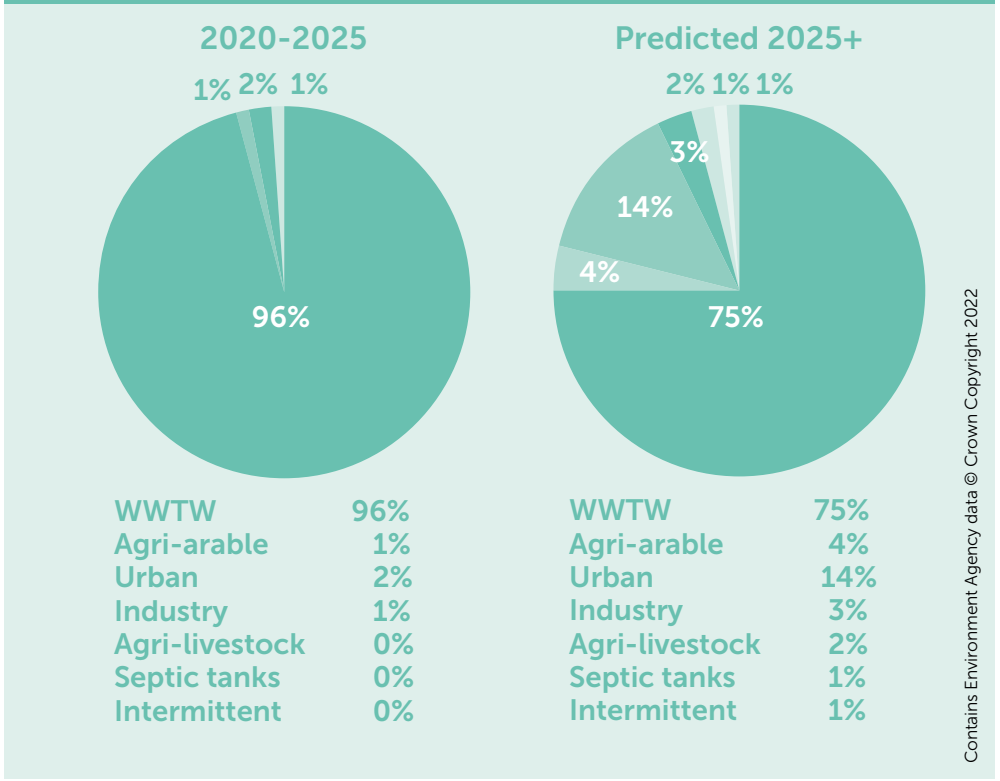
The River Chess fails to meet 'Good Ecological Status' due to a combination of nutrient enrichment from treated sewage effluent, low flows and modifications to the river channel.

In its upper reaches, the River Chess flows through the town of Chesham, where there are multiple connections between the road network and the river. In this area, fine sediment is transported from valley sides via the road to the river channel during heavy rain. Treated effluent from Chesham Wastewater Treatment Works contributes between 40 and 80% of flow to the river depending on groundwater levels in the catchment.

The sewage network around Chesham is infiltrated by groundwater when levels are high, overwhelming the treatment capacity at the Wastewater Treatment Works. As a result, the storm tanks at the Works discharged untreated effluent to the River Chess for prolonged periods during 2020 and 2021. Untreated effluent causes dissolved oxygen levels in the river to decline, threatening the health of fish and invertebrates. Thames Water have embarked on a programme of works to minimize groundwater infiltration into the sewer network during future periods of high groundwater levels.

It is estimated that 96% of the phosphorus in the river is currently sourced from sewage, and the river is classified as 'Poor Status' with regard to this nutrient. The Environment Agency has introduced a new permit requirement for final treated effluent from Chesham Wastewater Treatment Works to contain no greater than 0.25 mg/L phosphorus by 2024. Modelling by the Environment Agency predicts that this should enable the River Chess to reach 'Moderate Status' for phosphorus (< 0.191 mg P/L) and that Chesham Wastewater Treatment Works will then contribute c. 75% of the total phosphorus load in the river.

Proportion of Phosphorus in River Chess from different sources



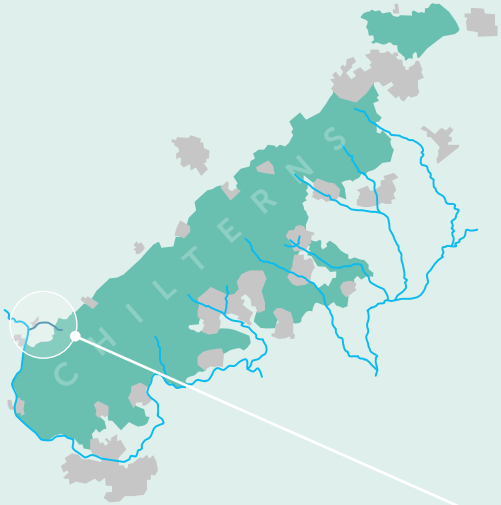
	2020-2025	Predicted 2025+
WWTW	96%	75%
Agri-arable	1%	4%
Urban	2%	14%
Industry	1%	3%
Agri-livestock	0%	2%
Septic tanks	0%	1%
Intermittent	0%	1%

EWELME BROOK

Ewelme watercress beds

Fine sediment smothering riverbed gravels

Ewelme Brook runs along roads for much of its length



View downstream to confluence with River Thames

KEY

- Environment Agency Gauging Station

THREATS

- Urban runoff
- Channel modifications
- Phosphorus

The Ewelme Brook is a small chalk stream (3.6 km in length) that emerges from the spring line at the foot of the chalk escarpment. Groundwater springs upwell around King's and Upper Pool in Ewelme, providing a constant flow of water in all but the very driest of years.

Historically, the brook was used for milling and latterly for watercress growing. The watercress beds at Ewelme, now a 2.6 ha Local Nature Reserve owned by the Chiltern Society, remain a key feature of the Ewelme Brook today. Volunteers manage the watercress beds, both for their cultural heritage value and to allow wildlife to thrive.

For much of its length, the brook flows alongside local roads and many drains directly connect to the brook, transporting sediment and pollutants into it when it rains. There is little energy in the flow to suspend this sediment and move it downstream and so the gravel bed is overlain with sediment and the gravels suffer from concretion, which binds the gravel together.

The channel is highly modified and flows for much of its length with straightened and reinforced banks between the road and residential properties. There are many small culverts and footbridges, along with old mill sites in Benson and Ewelme watercress beds which act as barriers to ecological connectivity. The 260m culvert between Benson and Ewelme is a major barrier to wildlife.

Whilst bullhead thrive in the waters of the brook, brown trout numbers have decreased markedly in recent years, which is thought to be linked to sedimentation and concretion of spawning gravels and poor connectivity of habitat.

Until 2018, the Ewelme Brook supported a small population of water voles. It is thought that the population's extinction was caused by a combination of its isolation, together with the fragmented nature of the habitat along the brook.

Much of the brook flows through private gardens and in places it suffers from over 'tidying' of both bankside and in-channel vegetation. Encouraging the growth of marginal and in-stream vegetation to improve flow diversity will help move fine sediments through these reaches.

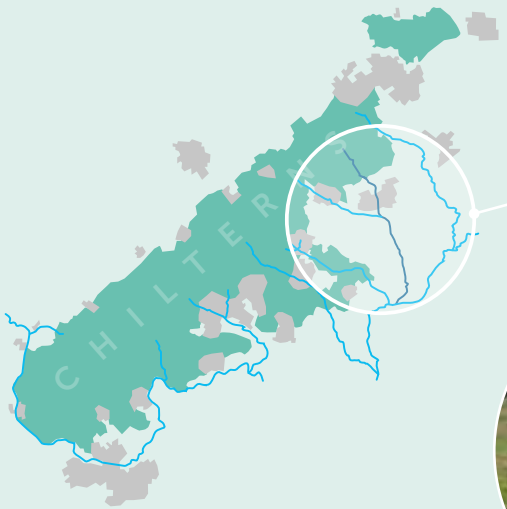
The Ewelme Brook is classified by the Water Framework Directive as being of 'Moderate Ecological Status'. Phosphate concentrations are elevated so the brook is classified as 'Moderate Status' with respect to phosphorus. The phosphate is thought to come from agricultural and land management sources.

Bullhead, also known as the Miller's Thumb

The Chilterns Chalk Streams Project is currently working with the Chiltern Society, Benson Nature Group and Benson Parish Council on a scheme to enhance the condition of the brook in Benson village. Funded through the Chalk Streams and Wetland Meadows Project, the scheme will deliver two small-scale restoration projects, the aim of which will be to enhance habitat in the brook, engage the local community in their delivery and create demonstration sites to highlight the type of work homeowners could replicate in their own gardens.

The scheme will also create an action plan for the whole brook to guide future restoration efforts and produce a management advice leaflet to be distributed to all riparian landowners. The scheme will be completed in March 2023.

RIVER GADE



KEY

- Environment Agency Gauging Station
- Extensive channel modification
- Great Gaddesden WWTW
- Berkhamsted WWTW

Dry river during 2019 drought

Restored urban chalk stream, Riverside shopping centre

Pollution from surface water runoff and sewer misconnections

Cassiobury Park, Watford

THREATS

- Low flows
- Urban runoff
- Wastewater treatment works
- Connection with canal
- Channel modifications
- P — Phosphorus
- DO — Dissolved Oxygen

The River Gade is under pressure from low flows that do not support 'Good Ecological Status', modifications to its channel that limit wildlife habitat, and nutrients from sewage treatment. The Gade is split into two sections for the purposes of the Water Framework Directive classification.

The upper stretch, running from the source to the confluence with the Bulbourne, is not classified as heavily modified with respect to the hydromorphology, but the overall ecological status was considered 'Bad' until 2019 when this stretch of the river was re-classified as 'Poor' due to improvements in fish, invertebrate and aquatic plants. However, low flows are a recurrent issue for this stretch of the Gade, and dissolved oxygen concentrations have been at 'Moderate' status since 2015.

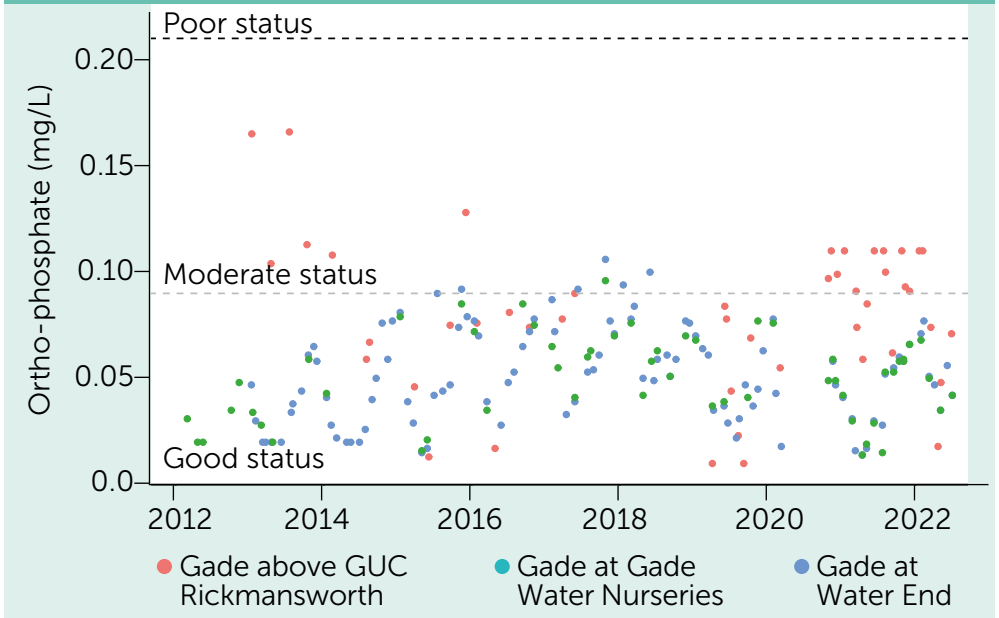
The channel in the lower stretch, below the confluence with the Bulbourne to the River Chess, is considered heavily modified by human activity and classified as having 'Moderate Ecological Status'. Here, phosphate concentrations increase due to inputs from Berkhamsted Wastewater Treatment Works on the River Bulbourne. An estimated 75% of phosphate in the lower Gade will be sourced from treated sewage following improvements to Berkhamsted Wastewater Treatment Works during the current water company asset management plan cycle, AMP7 (2020-2025).

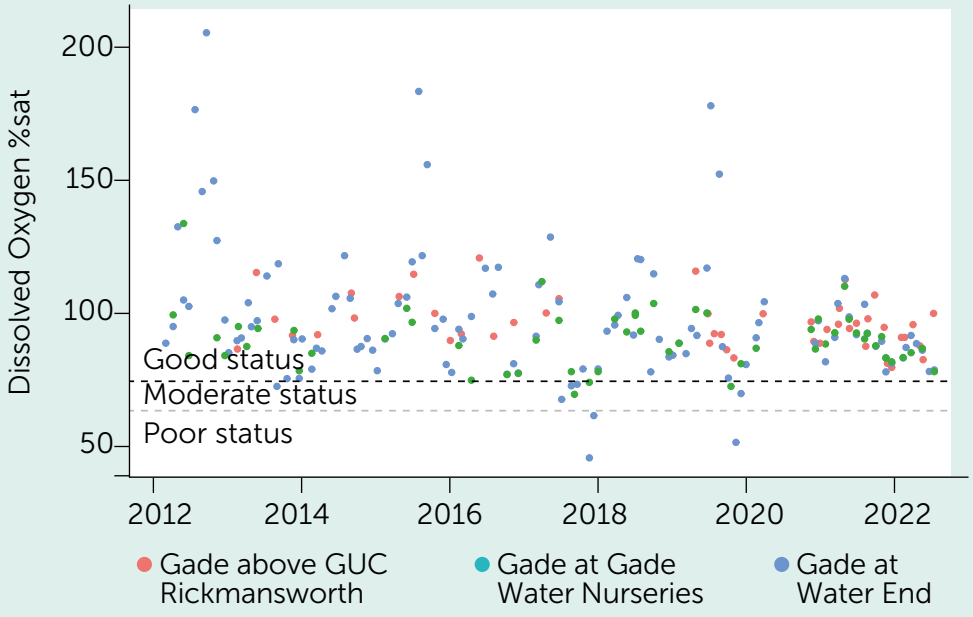
Because the channel of the Gade has been altered in the past, some sections of the river are now 'perched' above the valley bottom and disconnected from the groundwater. This means that when flooding occurs, for example in areas like Gadebridge Park, the water cannot make its way back to the river and remains in the park.

Returning the river to the valley bottom and re-connecting the river with its floodplain can help alleviate. Narrowing and introducing sinuosity (curves) to the channel in these areas can provide resilience to low flows and improve the diversity of habitats for wildlife. The Environment Agency, Dacorum Borough Council and Affinity Water are restoring the Gade at Gadebridge Park as part of the 'Revitalising Chalk Rivers' project to improve habitats for wildlife and allow visitors to enjoy this precious chalk stream environment.

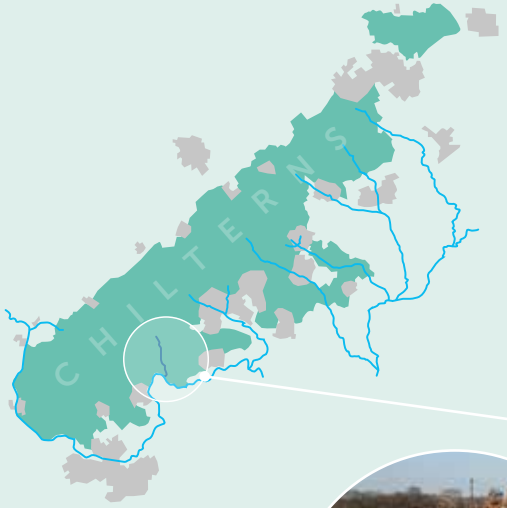
Along the Gade, there are weirs and other historical in-stream man-made structures that act as barriers to fish, and cause siltation. The gauging station weir at Bury Mill and the old mill sluice at Noakes Mill are two examples of structures in the action plan for the River Gade which need redesigning.

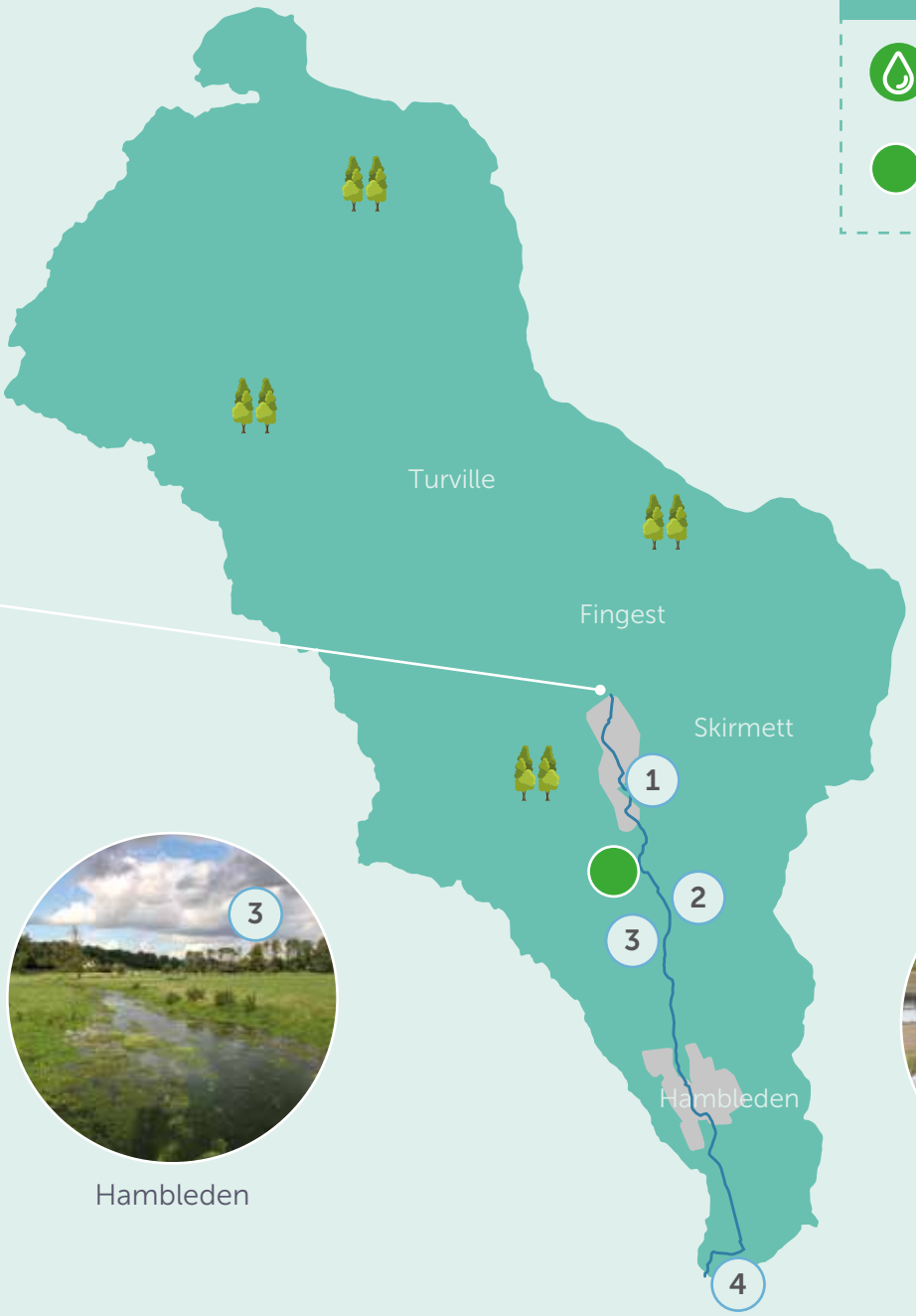
Ortho-phosphate and Dissolved Oxygen over time





HAMBLE BROOK





KEY

- Groundwater Abstraction for drinking water supply
- Historical trout fishery

Modified channel at Skirmett

Hambleden

Colstrope Farm

Flooding at Mill End in April 2021

THREATS

- Low flows
- Channel modifications

The Hamble Brook is an ephemeral stream that flows through the Hambleden Valley – this means that the stream dries throughout its length and can remain dry for several years in a row. Its source on the Ordnance Survey map is just north of Skirmett, but when flowing, the brook often appears as far north as Water Lane, and under very high groundwater conditions, such as in 2014, the brook can rise to the west of Turville and flow down Turville High Street. There is considerable debate about whether the Hamble Brook was always a winterbourne stream, but records of it drying completely certainly extend back to the 1930s.

Whilst a dry riverbed might look upsetting, ephemeral reaches of chalk streams can support rare species that are specially adapted to living in temporary water environments. Many of these species require the drying phase to complete their life cycle.

The nearest groundwater abstraction point is at Medmenham, where water is abstracted by Thames Water (TW) from the Thames Valley gravels and underlying chalk. The flows in the lower reaches of the stream downstream of Hambleden are thought to be affected by this abstraction, although the magnitude of groundwater drawdown is likely to be small compared to changes in groundwater level arising from seasonal and annual changes in rainfall pattern.

The brook is currently assessed as being of 'Poor Ecological Status' under the EU Water Framework Directive, due to poor fish and invertebrate populations and aquatic plant communities. Multiple modifications over the years such as for ornamental landscaping and flood alleviation, have impacted on the brook's natural function and ecology.

In particular, the presence of barriers such as weirs and culverts under the Hambleden and Henley Roads severely limit the ability of fish to colonise the brook from the Thames. Unrestricted grazing by cattle and sheep also plays a role in degrading habitats by grazing marginal vegetation, eroding the banks and increasing sediment loading into the brook.

In common with most chalk streams in the Chilterns, infiltration of groundwater into the sewer network is an issue in the Hamble valley. Where sewers pass through saturated ground, groundwater can enter the sewer network and in high groundwater conditions increased levels of infiltration may lead to surcharging sewers. Where surcharging does occur the effects are unpleasant, particularly if effluent enters a watercourse or properties. Infiltration into sewers also deprives chalk streams of flow.

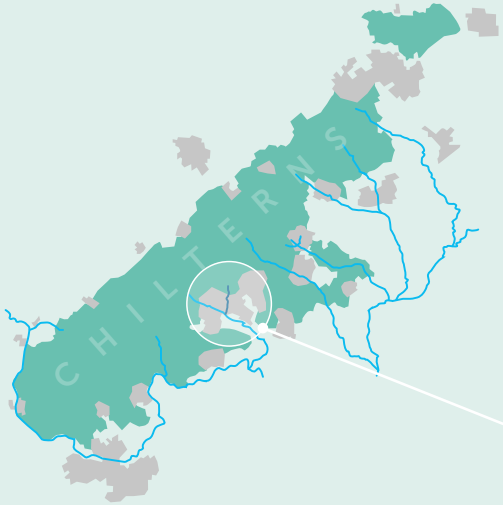
Surcharging sewer in Hamble Valley

Groundwater infiltration is a problem for water companies as it can lead to surcharging into properties, reduction of sewage works treatment capacity or even overload them. As a consequence, TW have developed a groundwater infiltration reduction programme which forms part of their Drought and Wastewater Management Plans which come into force from 2023. The CCSP has taken an active role in supporting TW in the development of these plans.

Recently, funding has been secured from the government's Green Recovery Challenge Fund and from the Environment Agency's National Chalk Rivers fund by the Chilterns Chalk Streams Project and Chiltern Society to restore habitat along a 1km section of the Hamble Brook.

The scheme will reinstate a more natural, sinuous channel to parts of the stream and remove over-widened sections to improve the diversity of flows in the stream during the wet phase. Development of a more diverse, ecologically valuable riparian habitat along the stream banks will also be encouraged to support invertebrate species during the dry phase. The scheme will be completed by March 2023.

HUGHENDEN STREAM



KEY

- Abstraction (water company) closed in 2018
- Urban runoff and culverted sections

Historical impoundment, Bottom Farm

Hughenden Manor, 2021

Sediment from road runoff smothering river gravels

EA Gauging station during 2019 drought

THREATS

- Low flows
- Urban runoff
- Channel modifications
- Dissolved Oxygen (DO)

The 3.5 km Hughenden Stream is spring-fed at its source in the Hughenden Valley, and flows south through the Hughenden Manor Estate to the River Wye in High Wycombe. Like other chalk streams on the dip slope of the Chilterns, the source of the Hughenden migrates at different times of the year in response to changing groundwater levels.

The Hughenden Stream is classified as being of 'Moderate Ecological Status' and heavily modified under the Water Framework Directive, with groundwater abstraction thought to have affected the aquatic plant community, and physical channel modifications contributing to the classification. The stream has been significantly modified at several points along its length.

At the top of the stream, and at multiple points along its length, there are connections with road drains. Road runoff to chalk streams introduces soil from road surfaces and particles from vehicle wear and tear. The movement of this material into the stream causes clogging or siltation of gravels and reduces water quality.

In Hughenden Manor Estate, the original stream channel was moved during the 19th Century for ornamental purposes, and seven weirs were introduced to create pools for trout fishing. Weirs can prevent the movement of fish and the over-widening of stream channels results in shallow water and settling out of fine particles from road runoff.

The result is heavily silted sections of the channel which impacts the ecology, and these types of channels have no resilience to the low flow conditions which may become a more frequent occurrence due to climate change.

Therefore, planned works include: reducing stream width and creation of a low flow channel; alongside partial removal of weir structures to reduce impoundment and siltation and to enable faster flow of water. Road runoff can be filtered through a combination of sump ponds and marginal wetland features to remove sediment before it reaches the stream.

South of Hughenden Manor, the stream flows through Hughenden Park, where a management plan supports the development of marginal vegetation to provide habitat for nesting waterfowl.

The introduction of in-channel features, such as riffles and deflectors to improve habitat and flow diversity, could help maintain healthy dissolved oxygen levels in the stream at times of low flow.

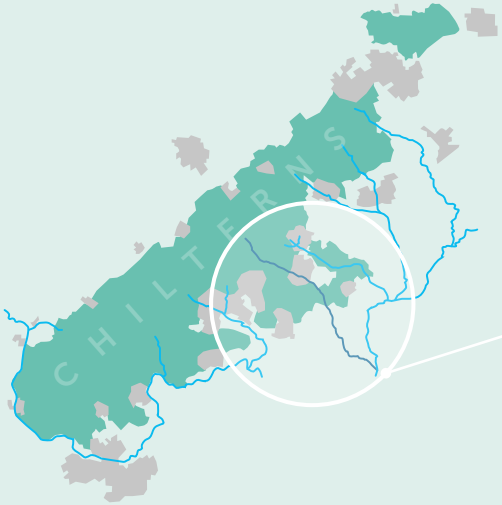
A dry Hughenden Stream, 2019

Downstream of Hughenden Park, the stream flows in a defined channel through a series of culverts, including at the confluence with the River Wye.

At the southern end of the stream, there are in-stream, man-made structures that may form barriers to fish migration from the River Wye. A gauging station in this location provides continuous measurement of the water levels.

View through culvert at Hughenden Park, 2019

RIVER MISBOURNE



Source at Mobwell Pond

Doctor's Meadow after restoration

Perched river channel at Chalfont St. Giles

Higher Denham

KEY

- Environment Agency Gauging Station
- Gerrards Cross Treatment Works
- London Road waste water balancing tanks
- Perched river reach

THREATS

- Low flows
- Wastewater treatment works
- P — Phosphorus
- DO — Dissolved Oxygen

The Misbourne is an intriguing chalk stream. The river flows for 27 km from its source at Mobwell Pond to the River Colne at Denham Country Park, but it frequently dries up in its middle reaches between Amersham and Chalfont Park.. Here the chalk aquifer is highly fractured, and the river is 'perched' above the water table.

At Chalfont St Giles, the ground-water can be as much as 10 metres below the riverbed. In the 1940s, groundwater abstraction levels in the catchment were approximately 4 ML/d but rose to a licensed abstraction of c. 33 ML/d by the 1960s. In 1998, an Alleviation of Low Flows scheme was carried out by Thames Water and Three Valleys Water (now Affinity Water), which reduced licensed abstraction to 14 ML/d. In 2018, Affinity Water reduced abstraction by 3 ML/d and are committed to a further reduction of 2 ML/d by 2025.

In recent years the Misbourne has benefitted from multiple restoration schemes.

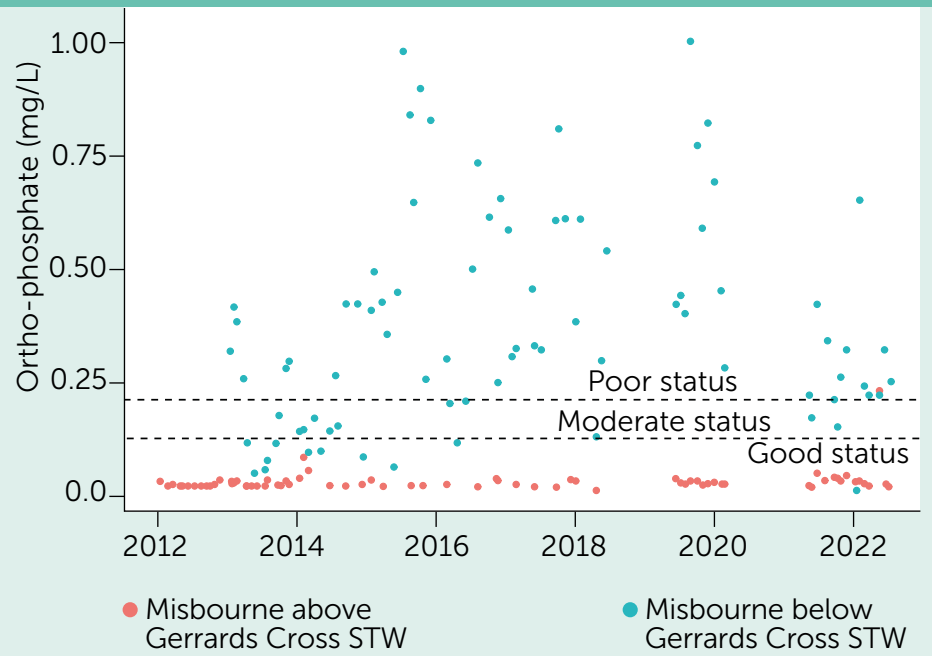
In 2012, Chilterns Chalk Streams Project, in partnership with the Environment Agency and the landowner, led a wetland habitat creation scheme at Doctor's Meadow. Banks were regraded, wetland pools and scrapes were dug and the river channel was narrowed and made more sinuous in the lower section of the reach.

To date, the Revitalising Chalk Rivers programme, a partnership between the Environment Agency and Affinity Water, has led to improvements in wildlife corridors at four sites along the Misbourne.

The most recent project, in 2020, created a new, meandering 1 km channel more closely aligned with the river's original path between the Amersham Bypass and Quarrendon Mill, to improve river habitat.

The Environment Agency identifies both water quantity and water quality issues on the Misbourne. The chart to the right shows a time series of ortho-phosphate levels in the Misbourne upstream and downstream of Gerrards Cross. Environment Agency analysis suggests that 97% of the phosphate in the River Misbourne is sourced from wastewater treatment works, and concentrations contribute to the 'Poor Ecological Status' of the river. High levels of phosphate encourage filamentous algal growth, which can reduce dissolved oxygen levels at night and harm the balance of the river ecosystem.

Ortho-phosphate concentrations over time



Source: Environment Agency data

Perched River Misbourne at Chalfont St Giles

River Misbourne at Little Missenden

RIVER VER

Himalayan Balsam

Ver at Redbourn

Hemel Hempstead

St Albans

KEY

- Markyate WWTW

THREATS

- Low flows
- Urban runoff
- Wastewater treatment works
- Channel modifications
- P — Phosphorus
- DO — Dissolved Oxygen

1. Source of the Ver

The embryonic River Ver has its origins in the dramatic tucks and folds of the high landscape west of Kensworth Lynch in Bedfordshire. It's only in very wet years, these days, that it begins at the point where two small valleys merge, occupied on the surface by Lynch House and Corner Farm.

2. Markyate Wastewater Treatment Works

The outfall from the sewage treatment works provides an unwelcome boost to the waters of the Ver. Often the effluent is high in phosphates and, in high groundwater years, it frequently discharges raw sewage into the river. In 2021, the unsavoury spills totalled 2642 hours.

3. Friar's Wash Pumping Station

In 1956, the pumping station was opened to take 15 million litres a day from the groundwater of the Ver valley to supply the growing town of Luton. It set the tone for three decades of high abstraction levels when nearly 50 million litres of water per day was taken from the valley, exceeding 50% of the effective rainfall.

4. Redbourn

In recent times, the springs on private land, close to the Chequers Inn just south of Redbourn, are the source of the flowing river – the 'perennial head' of the Ver.

5. Redbournbury Mill

There has been a mill on the site since before the Domesday Book (1086). Redbournbury is now the last working mill on the Ver and the waterwheel still turns if there is enough water. The mill produces a range of stoneground organic flours and operates as a working museum and craft bakery.

6. Water Voles (Redbournbury to Gorhambury)

In 2021, water voles were reintroduced to the river and its side streams in this area.
The project, a joint effort between the Herts and Middlesex Wildlife Trust and the Ver Valley Society, saw 150 water voles released and the early signs are that the initiative is headed for success.

7. Kingsbury Mill aka The Waffle House

The Ver was once mighty enough to power a dozen or more mills. Kingsbury Mill was formerly one of the St Albans Abbey's mills. Private milling carried harsh penalties in the 14th century and people were forced to pay to use the Abbey's watermills – helping to incite the 1381 Peasants' Revolt locally.

8. Verulamium Park and Lake

The long hot summer of 1976 was a turning point in the history of the River Ver. The river through the city dried up and the lake lost many of its fish and its favourable habitat – neither has regained their lustre. The Ver Valley Society was formed with a view to restoring the fortunes of the river and consequently the lake.

9. Sopwell Priory (site of)

Sopwell Priory was broken up following the Dissolution of the Monasteries but the ruins of its successor, Lee Hall, are still visible today. Dame Juliana Berners, reputedly a former Prioress, contributed a section in the Boke of St Albans (1496 edition), which is the earliest known English language work on fly fishing.
No doubt she was inspired by the Ver's chalk stream brown trout.

10. Park Street (watercress and invasive plant species)

The area was once the centre of a thriving watercress industry, with the cress being sent by train to London but also to Leeds and Liverpool. These days, other plants dominate the conversation – this is the furthest upstream extent of Himalayan balsam, Japanese knotweed and giant hogweed, all of which the Society is attempting to eradicate.

11. Moor Mill

The most downstream mill on the Ver is another of the Abbot of St Albans' medieval mills and has a long history. In 1140, the miller, who had permission to use his own lines, nets or traps, paid rent in the form of 250 eels a year to the The Cellarer at St Albans Monastery.

12. Riverside Way

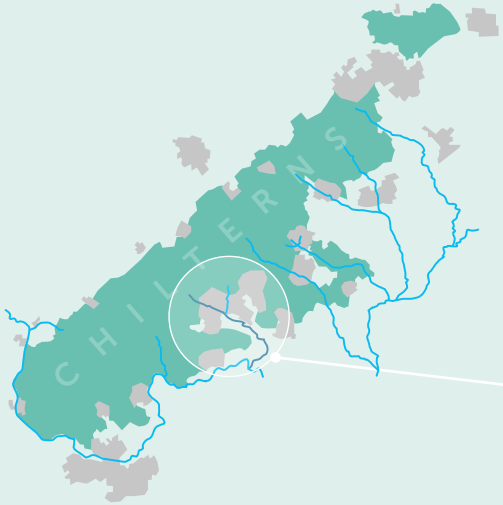
In this area, the Ver used to meander its way to the confluence with the Colne, near Bricket Wood. However, the course of the river was moved and straightened to accommodate gravel extraction in the 1970s. Nonetheless, today the river enjoys a good hatch of Mayfly in the spring and is a pleasant place for a walk by the Ver.

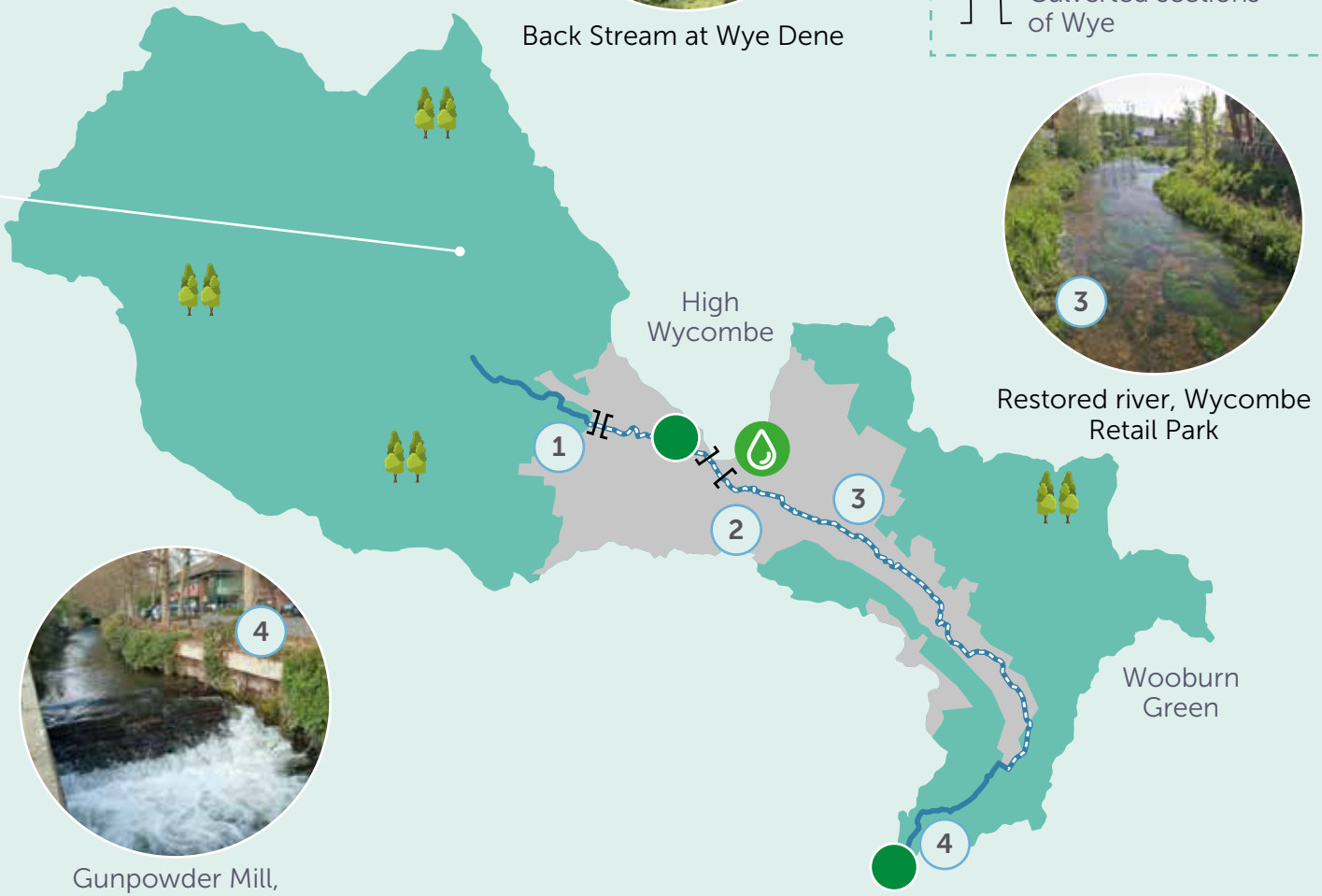
Mayfly

RIVER WYE

West Wycombe Estate

Back Stream at Wye Dene





Restored river, Wycombe Retail Park

Gunpowder Mill, Bourne End

KEY

- Abstraction (water company) reduced in 2020
- Environment Agency Gauging Station
- Urban runoff and channel modifications
- Culverted sections of Wye

THREATS

- Low flows
- Urban runoff
- Channel modifications
- Phosphorus

The Wye flows 17 km from West Wycombe, through High Wycombe, Loudwater and Wooburn Green to its confluence with the River Thames at Bourne End. The Hughenden Stream and Wycombe Marsh Brook are both tributaries of the Wye. The river is historically very important for industry, and at one time there were more than 30 mills along its course. With the growth of industry in the valley and development of towns and villages along its course, the river became highly modified and was quite polluted at one time. Despite this legacy of modification, the River Wye provides extremely valuable habitat for wildlife.

With development of the towns in the valley, demand for water increased which led to river flows being adversely affected. To address the problem, Thames Water reduced abstraction at Mill End near Desborough in 2010 and at Pann Mill in 2020.

In 2019, the upper section of the River Wye failed the chemical classification of the Water Framework Directive, in part due to the presence of a class of priority hazardous substances called polyaromatic hydrocarbons. These compounds can persist in the environment for a long time, with potentially adverse effects on aquatic wildlife. Polyaromatic hydrocarbons occur naturally in fossil fuels and are often the result of combustion; they are not usually deliberately produced. The most common pathways by which they can reach rivers are from the atmosphere and urban runoff from roads. The source of these compounds in the River Wye is unknown and under investigation by the Environment Agency.

A local community partnership called Revive the Wye (RTW) was launched in 2007 to improve the condition of the river for local people and wildlife. Since then, RTW partners have carried out over a dozen river restoration schemes along the river and have established an active volunteer group who carry out vital conservation work. As a key partner of RTW, the CCSP has helped set up a riverfly monitoring group and is currently delivering its Trout in the Classroom and river schools programmes in the catchment. The CCSP is also working with the Chiltern Society and Chiltern Rangers to install a series of interpretation boards and improve river habitat along the Wycombe Marsh Brook this winter, funded through the Chalk Streams and Wetland Meadows Project.

'Supporting The Chilterns Chalk Streams Project has been a key objective for Chiltern Rangers since their launch in 2013. Since then they have worked closely with Allen and the team to restore many sections of the River Wye with a focus of involving volunteers of all ages from the community, engaging a wide range of community groups.

Probably the most complex restoration was in the summer of 2016, when two canalised sections of the river in the town centre were restored with a wide variety of techniques – wet stone walling, craning rocks into the channel, coir roll berms, etc. etc.! All with the support of 100 young people and 150 adults over one intense week of work.

A video of this project can be found by searching 'Young Roots Project Wycombe Town Centre'. We are hoping that our next stretch of the river, from Barrowcroft to Kingsmead, will be restored during the winter of 2022.'

Paul Stack of Chiltern Rangers

SCARP SLOPE STREAMS

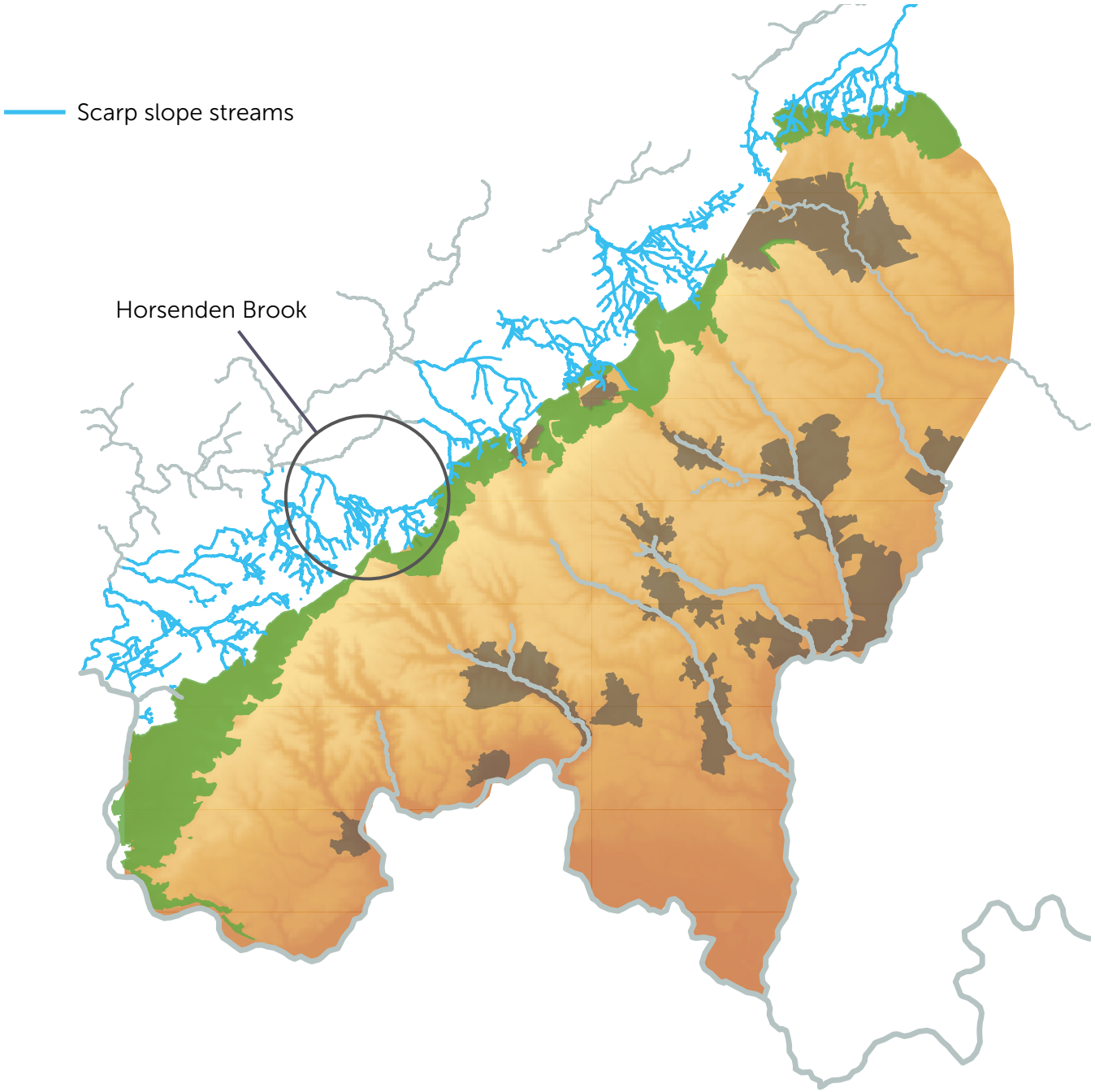
Barton Springs

'Water in a Dry Landscape' is designed by CCSP to look in detail at the ecological status and opportunities for restoration of chalk scarp streams between the M40 and the A41 which feed into the Thame catchment. The project is a partnership between River Thame Conservation Trust (RTCT) and CCSP, delivered in three phases as part of the Chiltern Conservation Board's 'Chalk Cherries and Chairs, Landscape Partnership Scheme', supported by the National Lottery Heritage Fund. Phase One, led by CCSP, started with a volunteer-led survey of 47 sites across the project area to assess water quality at the source, middle and end reaches of scarp streams to identify key water quality changes along their length.

Site surveys were also carried out to identify opportunities for enhancement and restoration along the different streams. Through this work, a series of maps was created to show water quality variations, and the team agreed that the remainder of the project would focus on the Horsenden Brook, parts of which are designated as a chalk stream.

Initial surveys of the Horsenden Brook indicated that the stream had lost its population of brown trout; eDNA sampling by the RTCT confirmed that there is no remaining or relict trout population in the stream. On the positive side, the surveys indicated that there are opportunities to remove impoundments along the stream, which should lead to the natural re-stocking of the trout population. Over time, the river channel has been straightened, and the gradient is now so steep that there is little by way of refugia for fish in strong flows. As a consequence, when there is a flood, any small fish will get washed out of the catchment and down through weirs that will form barriers to their upstream migration.

The next phase of the project is to work with a group of landowners and a farmer cluster in the Princes Risborough area to identify and prioritise river restoration options along the brook, with a view to delivering restoration that will improve connectivity and habitat, with the long term aim to reintroduce brown trout. It is hoped this will form a basis for more projects in partnership with RTCT looking at the chalk streams interface between the Chilterns escarpment and River Thame tributary catchments.



Horsenden Brook, upstream of Bledlow Road

CURRENT ACTIVITIES

For the first 20 years of the Project's existence, a single project officer was employed to manage the project and deliver its annual work programme. That all changed in 2018, when Thames Water provided some additional funding to enable the Project to recruit an Education and Engagement Project Officer, initially on an 18-month contract. This marked the start of a tremendously exciting period of growth for the Project.

Allen Beechey, Chilterns Chalk Streams Project Manager

My role has changed markedly from one of hands-on delivery of the Project's work programme to that of managing the expanding team and steering the strategic direction of the Project.

As a result of new investment, we have been able to secure Prof. Kate Heppell (some of her already impressive contribution can be read in this report) on secondment to the Project from Queen Mary University of London, for two years and to recruit a new Citizen Science Coordinator who will help us to expand our citizen science initiatives across the Chilterns.

I have also been able to work with partners in new ways to further the conservation objectives of the Project and to develop a new and ambitious Lottery project with partners and colleagues at the CCB, which will hopefully help to secure the financial future of the Project beyond 2025.

Ceri Groves, Chilterns Chalk Streams Education and Engagement Officer

This year the school visits programme has gone from strength to strength. A new partnership with Chiltern Rangers has allowed a big expansion of education activities on the River Wye. Working with the River Chess Association, I have also delivered a 5-week long programme for students at Alfriston School where students learnt how to survey physical characteristics and wildlife of the river, and also took part in some practical conservation activities. Next year we hope to add a fishing lesson to this programme!

I have been working with parish councils and community groups on the Ewelme Brook to create an advisory leaflet for homeowners who have the brook in their garden. We're also planning some small-scale river restoration at demonstration sites. I'm working on a few projects to improve project communications – launching a new e-newsletter, and writing our new website, which includes three new films about Chilterns chalk streams.

Laura Silverstone, Education and Engagement Officer

Our education programme offers a range of activities for schools and families. Our main aim for these sessions is to highlight what a chalk stream is, their features, the wildlife that live in them and the threats to these special habitats. We offer "Stream Safaris" but can also bring the river to the classroom in our "Invertebrates in the classroom" sessions. We cater for all ages and link to the geography and science curricula.

Working alongside Ceri, I have been extending the current outreach of the education programme to the Rivers Ver and Bulbourne. Funded by the Green Recovery Challenge Fund, I have been working on a project to rejuvenate the Chess Valley walk, a 10 mile stretch between Rickmansworth and Chesham. Working with local landowners and councils, we have explored access and walkers' experiences along the Chess Valley.

For the first time in its history, increased investment from its partners and multi-year funding agreements are allowing the Project to build real momentum and take a longer-term approach to chalk stream conservation. The Project team has been expanded, increasing delivery in key areas, such as education and awareness, practical conservation, citizen science, catchment-scale working and advocacy.

Adrian Porter, Rivers Officer
My role as a Rivers Officer is to research the character of the proposed restoration area, design the plan and implement the project. Historical and modern land use practices have resulted in our chalk rivers typically being over-widened and over-straightened. River restoration usually involves the introduction of natural materials to narrow the channel and to recreate the snake-shape pattern we remember from our geography textbooks, whilst, at the same time looking for ways to improve flow variety and the balance of light and shade within the channel.

This year, I've been working on five plans in parallel on the Chess, Wye and Hamble Brook. Critical to the success of our restoration schemes is the work of our volunteers and citizen scientists. If you are a citizen scientist and/or a restoration volunteer, I not only very much appreciate the contribution that you make to river restoration, I couldn't succeed without you!

Kate Heppell, Research Officer
I've been seconded from Queen Mary University of London to focus on water quality issues and carry out a baseline assessment of the Chilterns chalk streams. Having collated pre-existing water data and knowledge from stakeholders, I have evaluated threats to the health of the River Chess, identified data gaps and prioritised recommendations for action.

I've initiated a programme of citizen science activities: Modular River Survey for habitat assessment, MudSpotter to track sediment input to the river and SmartRivers to understand the threats to health of invertebrate populations. We have also begun water sampling to assess the levels of so-called 'emerging' contaminants in the River Chess. These initiatives should enable us to fill our knowledge gaps, and to track the impact of our Chess Smarter Water catchment plan. I am now focused on understanding the threats to the other Chiltern chalk streams, and this report reflects some of the key findings from the first stage of this analysis.

Steph Horn, Chess Smarter Water Catchment Co-ordinator
Starting the role of Catchment Coordinator in March 2022 was an exciting time to join the project. Baseline reports on 'The State of the River Chess' were just being published, enabling me to really get to grips with the Chess from day one. This baseline will be crucial to measure and track the success of CSWC interventions.

The past few months I have focused on developing partnership relationships with all the stakeholders within the catchment, improving engagement plans and ensuring the delivery of the ambitious targets set for Year 2 are delivered.

FUTURE VISION

Sunrise in the Chess Valley

From what you have read in this report, it is hopefully clear that behind the achievements of the project there is a groundswell of support from local communities and a collective desire amongst partners and stakeholders for the Project to continue to deliver more for Chilterns chalk streams and play its part in their recovery.

Of course, the CCSP cannot bring about a recovery in the Chilterns chalk streams alone. It requires a sustained and integrated approach by all stakeholders working together in the long term. But it does have a key role to play.

The partners' ambition is for the Project to be a driving force in the conservation and sustainable management of chalk streams in the Chilterns, to effect significant and lasting positive change. This will be done by a combination of advocacy, awareness raising and education; including facilitating access to chalk streams so that communities have the opportunity to enjoy these precious habitats and appreciate their value.

The Project will increase the scale of its practical restoration programme and continue to provide specialist advice to landowners, land managers and local organisations. Crucially, it will offer vital support to community groups and citizen scientists working to enhance habitats and gather data that documents what is happening to their local rivers. Finally, the Project aims to be the 'voice for chalk streams' in the Chilterns, ensuring their long-term health is assured and their status enhanced.

As the Project moves forward, it is seeking to help deliver the complex solutions to the biggest threats facing chalk streams; the most significant of all being long-term abstraction reductions. With the spiralling threat of climate change, stakeholders must work urgently to leave more water in the environment to safeguard these rivers against the spectre of increasingly frequent droughts, which threaten their very existence. The Project is now well-positioned to play an important role tackling this existential threat.

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WAYS YOU CAN HELP

Riverfly monitoring is a great way to help protect your local river

Whether you are interested in practical volunteering opportunities such as river restoration, researching the state of your local river using citizen science, or campaigning about your local river in the Chilterns, the Chilterns Chalk Streams Project can help.

Do get in contact with us at: office@chilternsaonb.org

For more information about Chiltern chalk streams and the work of the Project go to: chilternstreams.org

If you spot an urgent issue with your local river, please call the Environment Agency incident hotline on 0800 80 70 60.

ACKNOWLEDGEMENTS

The considerable achievements of the Chilterns Chalk Streams Project would not be possible without the committed support of its partners.

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All other photographs – Allen Beechey

The River Chess at Sarratt Bottom

For more information about Chiltern Chalk Streams and the work of the Project go to: chilternstreams.org

The Hamble Brook at
Hambleden, May 2020

Designed by:dianaedwardsdesign.co.uk

chilternstreams.org

CHILTERNS
CHALK STREAMS
PROJECT