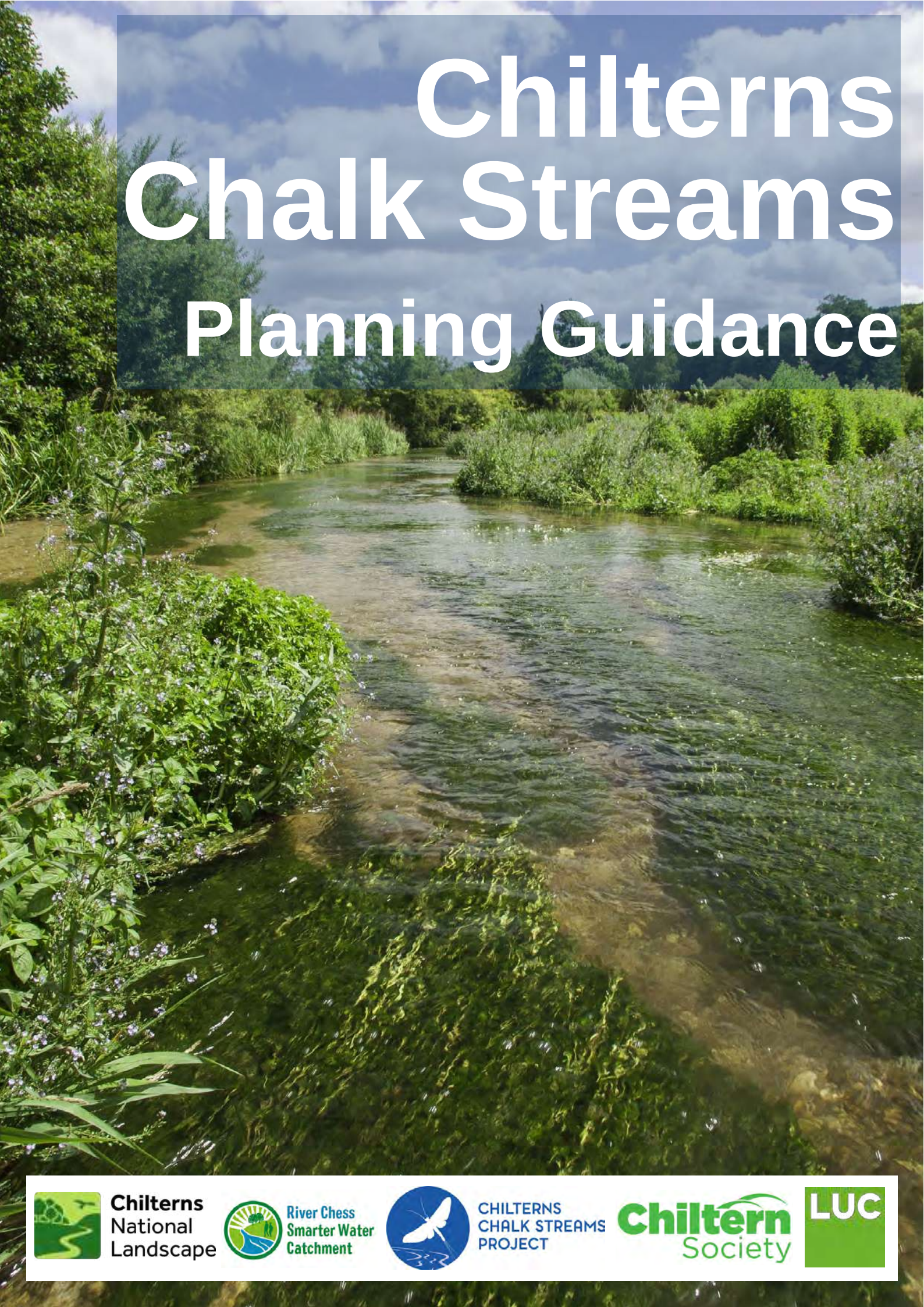
Chilterns Chalk Streams

Planning Guidance



Chilterns National Landscape

River Chess Smarter Water Catchment

Chilterns Chalk Streams Project

Chiltern Society

LUC

Contents

Published by the Chilterns Conservation Board (CCB), a Conservation Board established under the Countryside and Rights of Way Act 2000.

STATUS: This Planning Guidance was subject to formal stakeholder consultation in November/December 2024. It was considered by the Chilterns Conservation Board's Planning Committee on 23 January 2025, who approved the guidance for immediate use, and for final adoption by the Board on 27 March 2025.

EXPLANATORY LANGUAGE: The Chilterns National Landscape covers the area designated as the Chilterns Area of Outstanding Natural Beauty (AONB) and the Chilterns Conservation Board. AONB is the legal designation. The CCB was established in 2004 under powers given in the Countryside and Rights of Way Act 2000, to seek to further the purpose of conserving and enhancing the natural beauty of the AONB, and the purpose of increasing the understanding and enjoyment by the public of the special qualities of the AONB.

© Many thanks to Chilterns Chalk Streams Project for providing a number of the photos presented and Thames Water for funding the production.

Executive Summary

This Planning Guidance aims to provide clear advice on how those involved in land use planning can help protect, preserve and enhance the chalk streams of the Chilterns National Landscape.

It sets out the importance of chalk streams in relation to the National Landscape designation and provides guidance on how development can be appropriately planned to avoid harm, and provide positive outcomes for chalk streams within the Chilterns. It will be of assistance to public authorities in carrying out their obligations under the Levelling Up & Regeneration Act to facilitate the protection and enhancement of chalk streams as a key quality of the Chilterns National Landscape.

Chalk streams are rivers that are fed from water held within the underlying chalk bedrock. 85% of chalk streams globally are found in the England, particularly Southern England. All rivers, including chalk rivers, are considered to be priority habitats or habitats of principal importance in England.

The Chilterns is home to some of the world's most beautiful and picturesque chalk streams. There are approximately 60km of chalk stream within the National Landscape. However, the total length of all chalk streams that rise within the National Landscape (and from Chilterns Chalk just beyond the boundary) is closer to 250km[1] . The exact length of the chalk streams in the Chilterns is difficult to define and will vary over the course of a year as their ephemerally flowing, winterbourne headwaters respond to seasonal changes in the water table. Winterbournes are found in the upper reaches of the river and will have periods of the year where the ground is dry through the summer and into early autumn (as ground water levels fall).

There are nine principal chalk streams within the Chilterns and each of these rivers are unique. None are in good condition, according to the latest Water Framework Directive assessment, and in some cases, they are in danger of disappearing altogether:

- River Ver (moderate status)
- River Gade (poor status)
- River Bulbourne (poor status)
- River Chess (moderate status)
- River Misbourne (poor status)
- Hughenden Stream (moderate status)
- River Wye (poor status)
- Hamble Brook (poor status)
- Ewelme Brook (moderate status)

The reasons behind the poor status of these rivers are numerous and complex but the key issues affecting chalk stream health are abstraction, pollution and run off, physical modification, invasive non-native species and climate change.

1 The exact figures are not currently known due to mapping inconsistencies (for example there are inconsistencies in how scarp slope streams have been mapped by Natural England).

In addition to the principle chalk streams that rise in the south east of the Chilterns escarpment, many small streams and ponds arise from chalk springs in the north west sloping scarp. These streams flow towards the Ouse, Cam and Thame catchments. This guidance applies to all chalk streams, not only the nine principal rivers.

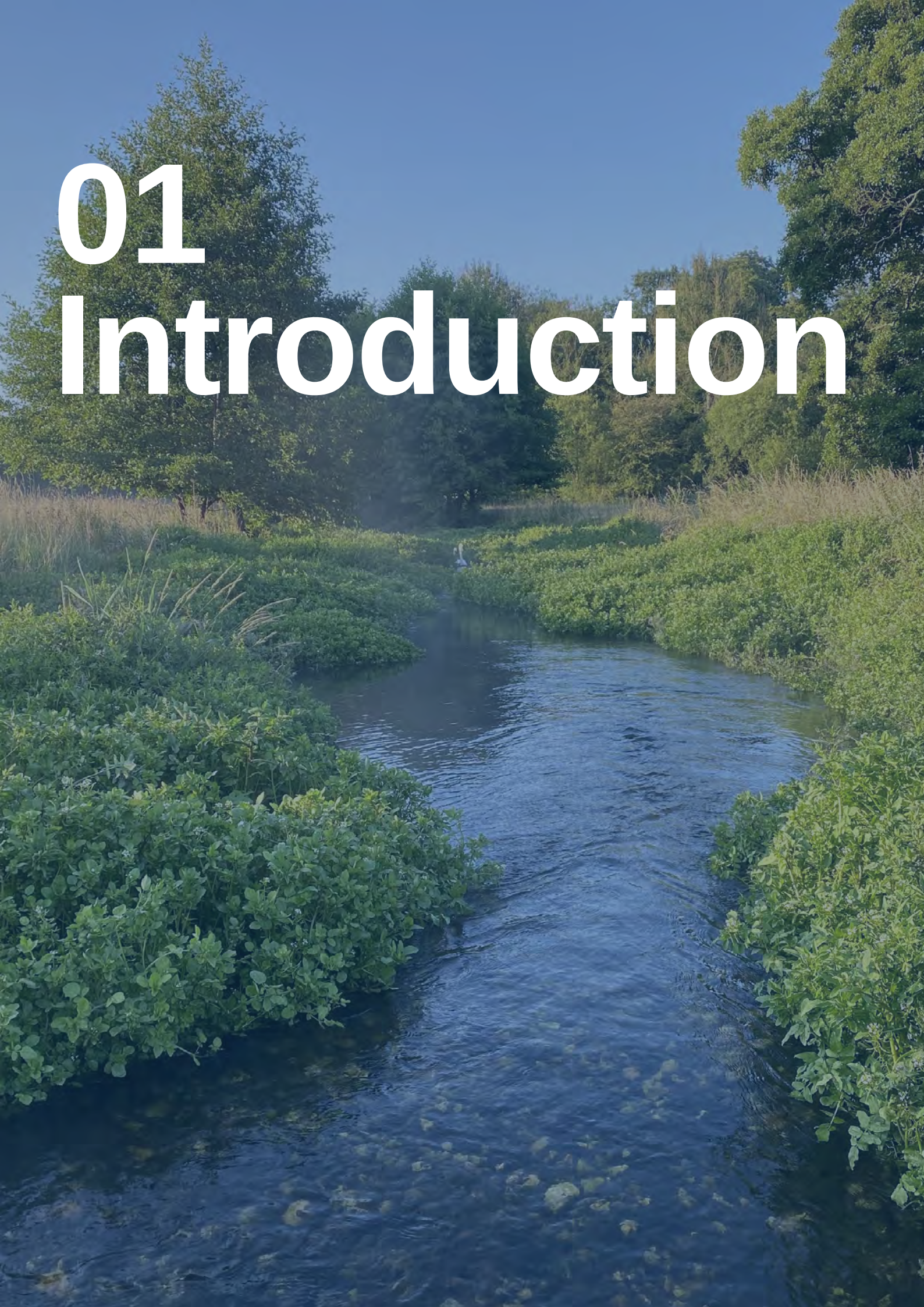
Planning for chalk streams

There are strict controls on the scale, type and nature of development that can take place within National Landscapes, as set out within the National Planning Policy Framework (NPPF). Decision makers are required to give great weight to the conservation and enhancement of National Landscapes, and the scale and extent of development is expected to be limited.

Where development is acceptable in the National Landscape, there is a role for planning to ensure that any development improves the status of chalk streams. Development outside of the National Landscape may also impact on chalk streams and decision makers should consider this possibility.

This document provides guidance for those producing local and neighbourhood plans. It sets out recommendations on how plan makers should consider chalk streams as part of plan making. Local plans should reference chalk streams within the vision and objectives of the Plan, as well as policies relating to the National Landscape, water use and demand, habitats and species, biodiversity, sustainable drainage, design and site allocations. Neighbourhood plans can include policies on the water environment and chalk streams where relevant.

With regard to specific development proposals early engagement with the relevant local planning authority in the form of pre-application discussion is recommended for all but the most minor applications in the National Landscape. This is particularly important where an application site includes or is within close proximity to a chalk stream. It is also recommended that developers engage with both the Chilterns National Landscape and Environment Agency at an early design stage to ensure developments are planned appropriately. The National Landscape should be consulted on any development that could affect a Chilterns chalk stream, even if that development lies outside the boundary. Developments outside the boundary can still have material influence on the health of chalk stream habitat, and therefore the condition of the National Landscape. An example might be the culverting of a chalk stream outside of the National Landscape which may ecologically isolate a chalk stream headwater and impact on its overall health. Applicants should consider how their scheme may impact on chalk streams and respond to this in their design deliberations. This document contains a range of suggested enhancements and positive actions which should be implemented as part of new development. Applicants should explain the choices they have made and how their development will address chalk streams in their Design & Access Statement. The level of detail provided should be relative to the likely direct or indirect impacts which may arise because of the scheme.



01 Introduction

Aims and objectives of this document

This Planning Guidance aims to provide clear advice on how local stakeholders can help protect, conserve and enhance the chalk streams of the Chilterns National Landscape.

It will be of particular use to those involved in land use planning, either at a strategic (policy making) level or those considering a specific development (development management/planning applications).

It sets out the importance of chalk streams in relation to the National Landscape designation, relevant legislation and national policies governing development around chalk streams. It provides guidance for those dealing with development and is intended to support positive policy production and provide tangible actions that developments affecting a chalk stream should take.

The document relates to decisions and development that affect the Chilterns National Landscape. It is obviously applicable to all development activity taking place within the boundary of the National Landscape but also applies to developments proposed in the setting of the National Landscape. It can, and should, be used by a variety of stakeholders within and outside Chilterns National Landscape. The aim in providing this guidance is to support consistency of approach across a wide geographic area (as chalk stream catchments extend well beyond the boundaries of the National Landscape). It aims to ensure appropriate enhancements of these precious, unique and iconic rivers.

Special qualities of the Chilterns National Landscape

The Chilterns National Landscape is one of 46 areas of the UK safeguarded for its distinctive character and beauty. The legal purpose of National Landscapes is ‘to conserve and enhance the beauty of the area’. Beauty is not just the look of the landscape, but also includes the landform and geology, the plants and animals, the landscape features, and the rich history of human settlement over the centuries.

Each National Landscape has a distinct set of special qualities which explain what the particular characteristics of the area are that make it worthy of designation.

The special qualities of the Chilterns include a wooded landscape with a rich natural tapestry of ancient hedgerows and trees, generally tranquil countryside with dark skies, extensive common land and public rights of way and a rich industrial heritage with distinctive buildings.

The most relevant special qualities in relation to this Planning Guidance are the dramatic chalk escarpment and its fast flowing chalk streams. There are four types/groups of chalk stream, two can be found in the Chilterns. For the purposes of this document the definition of the two found are: Group A. classic slope face chalk streams, defined as 'principle streams', those that rise directly from and flow over the chalk, & Group C. scarp-face chalk streams, defined as 'scarp-slope streams' which rise at the base of the chalk and tend to run for a short distance into alternative geology[1]. These streams are a globally scarce habitat, protected as Priority Habitats, and home to some of the UK’s most endangered species including those listed in Section 41 of the NERC Act as Species of Principal Importance (such as otter, water vole, reed bunting and brown trout). There are nine principal chalk streams in the Chilterns as outlined from page 12-20. Numerous other chalk springs occur along the base of the chalk escarpment. These scarp-slope streams are often overlooked but they are significant because they feed the headwaters of chalk streams flowing north and west out of the National Landscape and its setting, including, the Hit, Flit, Ouzel, Ivel, Stoke Brook, Bear Brook, Cuttle Brook, Horsenden Stream. Chalgrove Brook, and Lewknor Brook. The chalk streams also flow for some distance outside of the National Landscape boundary. It is important to recognise that actions outside the boundary can still impact on the special qualities of the National Landscape via this connection.

[1]As defined in the CaBA Restoration Strategy 2021 page 11.

Preparation of this Planning Guidance

The Levelling-up and Regeneration Act has strengthened the duty for all relevant public authorities to seek to 'further the purposes' of designated landscapes such as the Chilterns National Landscape. The new duty broadly follows recommendations from the Glover Landscapes Review and responds to concerns that protection and enhancement of Protected Landscapes needed to improve. Relevant authorities must now take active steps to demonstrate that they are seeking to further the statutory purposes of Protected Landscapes, as opposed to simply considering them in decision-making.

This obligation on relevant authorities to further the statutory purposes underlines the need for decision makers to clearly explain how their decisions protect and enhance the Chilterns National Landscape, and its special qualities. This Planning Guidance provides information on how a relevant authority can demonstrate they have met the new duty.

The 2019 Management Plan for the Chilterns National Landscape recorded that of the 9 chalk streams within the Chilterns, four are assessed as in poor condition and five in moderate condition. This is a decline since the previous 2009 assessment. There has been no improvement in status on any of the rivers since.

Recognising the serious national threat to chalk streams the Catchment Based Approach (CaBA) set up a chalk streams hub and restoration group. The group launched the Chalk Stream Restoration Strategy in 2021. It calls for chalk streams to be given enhanced environmental status and sets out a series of measures to restore vitality. The Strategy was followed in 2022 by an Implementation Plan which contains recommendations and actions necessary to support chalk stream restoration. The Chilterns National Landscape endorses the Chalk Stream Restoration Strategy and Implementation Plan and expects those undertaking development within the National Landscape to follow the actions established within it.

Led by the Chilterns National Landscape, the Chilterns Chalk Stream Project is a partnership of statutory institutions, conservation charities and local community groups, set up to protect and conserve all chalk streams that flow through the National Landscape. The project co-hosts the River Chess Smarter Water Catchment Initiative , which it intends to follow with a similar initiative "Mending the Misbourne", and others, in due course. The purpose of the Initiative is to deliver an intensive approach to catchment management, delivering improvements under six key themes: improving water quality, managing flow, improving wildlife corridors, managing invasive non-native species, working together, and involving people. One of the actions is to prepare a planning advice pack to aid the protection of chalk streams.

Funded through the Chess Smarter Water Catchment Initiative, the Chilterns National Landscape has published this Planning Guidance to assist landowners, architects, designers, builders, planning and highways authorities, parish councils, lead local flood authorities and any organisation or individual with an interest development and chalk streams within the Chilterns.

The Guidance has been prepared by LUC, with input from a wide stakeholder group. The stakeholder group included representatives from the Chilterns National Landscape, the Environment Agency, Natural England, water companies, CPRE, wildlife trusts, planning authorities, members of the CNL planning committee, and others. Stakeholders provided their views through an initial survey in the summer of 2024, two virtual workshops in September and December 2024, and through written comments on draft version of the document.

Governance of chalk streams

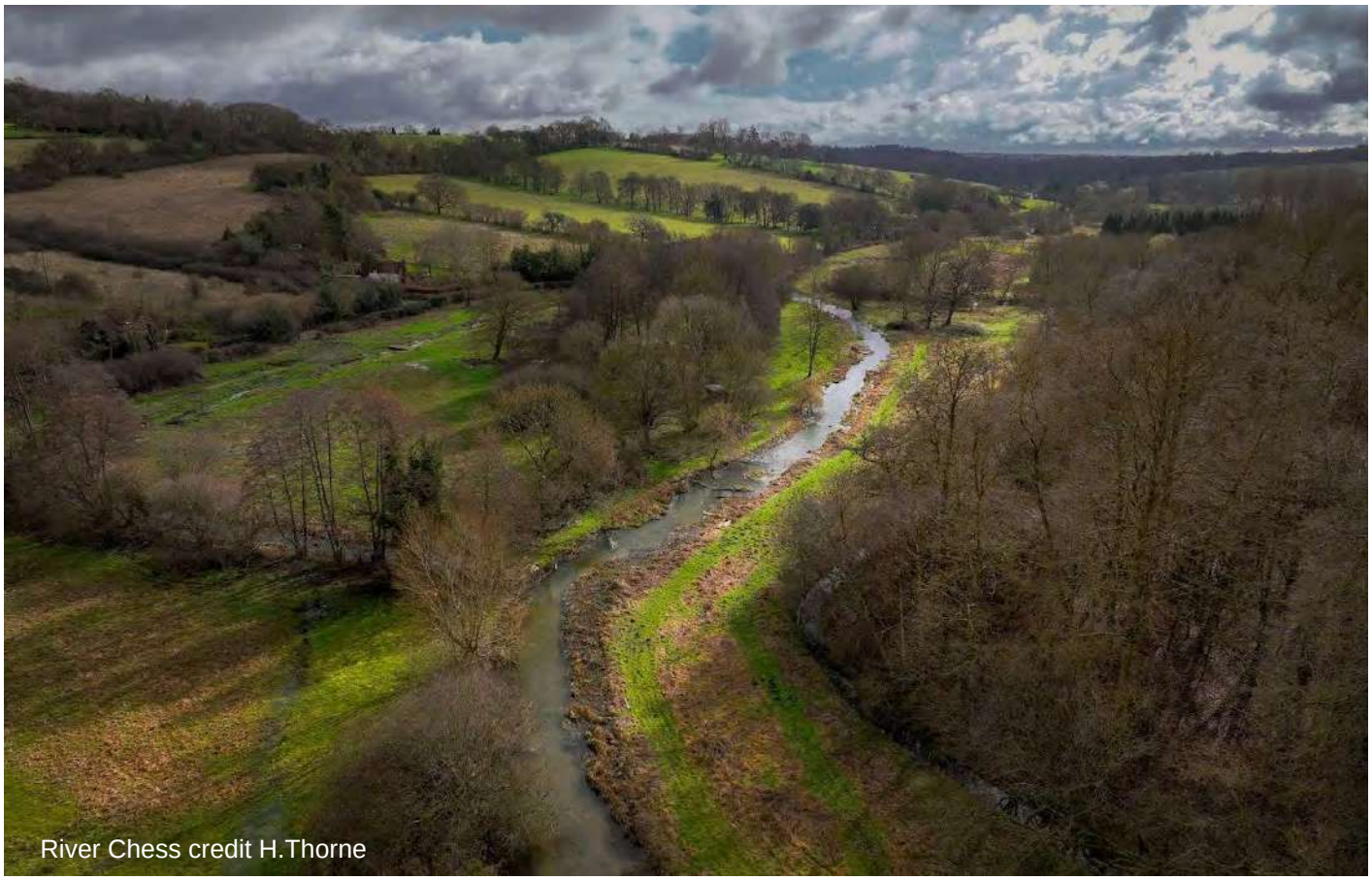
DEFRA (Department for Food and Rural Affairs) manages the water catchment approach for all water catchments in England. The catchment approach is embedded in the Water Environment (Water Framework Directive) (England and Wales) 2017 Regulations which transposed the European Water Framework Directive (WFD) into law in England and Wales. The WFD requires that all EU member states work to have their waterbodies in 'good ecological status' (or 'good ecological potential' for heavily modified waterbodies) with full compliance by 2027 if not possible by 2015. In addition to improving the status, there must be no deterioration. Local Authorities are expected to also consider water efficiency when appraising planning applications through Section 83 of the Water Act (2003).

The Environment Agency is a national regulatory body and a statutory consultee within the planning system. The Environment Agency is the Government's environmental regulator, and its role includes ensuring the proper management of rivers and streams by their riparian owners, including through the issue of environmental permits. The Environment Agency does not generally own watercourses but will advise riparian owners on upkeep or management of the river.

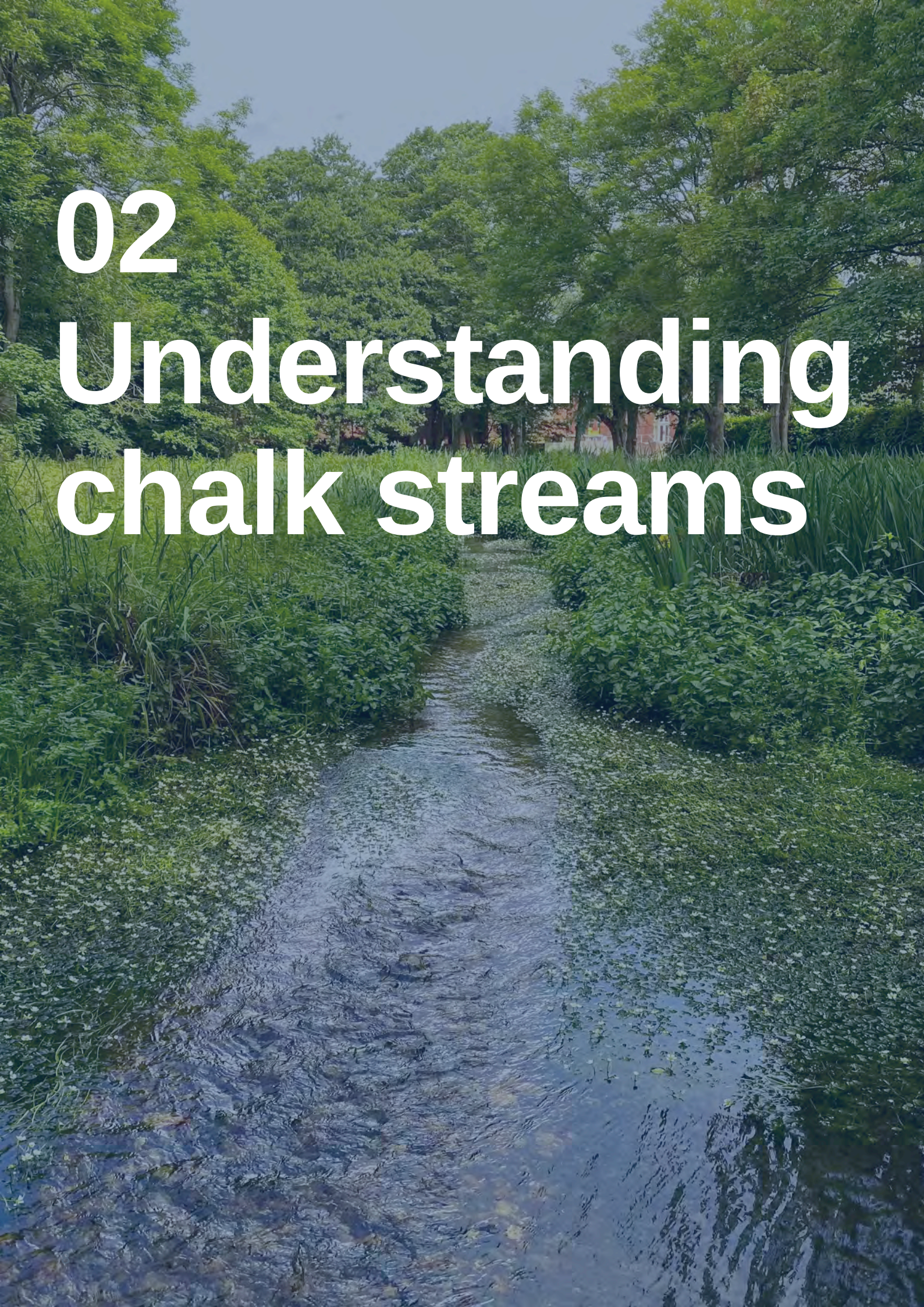
Water companies set out their own plans in relation to water in their individual Water Resource Management Plans. Six water companies in the South East have also jointly prepared a Water Resources South East plan, which is relevant to the area covered by this guidance.

The Chilterns Chalk Stream Project provides advice to landowners on river and riparian management, carries out practical projects to enhance streams for wildlife, improves access where appropriate, undertakes surveys and provides educational activities and resources.

With regards to managing change and development, it is Local Planning Authorities (or other decision makers such as the Planning Inspectorate) who must ensure that the National Landscape is conserved and enhanced through Local Plans and through decisions on planning applications. Local Planning Authorities have a responsibility to consider the effects of development on the National Landscape. This includes whether development will impact on the special qualities of the National Landscape. Therefore, in making land use planning decisions Local Planning Authorities have a clear responsibility to protect and improve chalk streams.



River Chess credit H.Thorne



02 Understanding chalk streams

Understanding chalk streams

Character and Location

Chalk streams are fed from water held within the underlying chalk bedrock. They are a globally rare and special habitat present only in England, France and Denmark. 283 chalk streams are found in England, which represents 85% of the global total. Most are located in the South and East of England but chalk streams can be found as far north as the Humber and East Yorkshire.

Chalk streams are a unique and special type of river. Their key characteristics include:

- Crystal clear water
- Clean gravel bed
- Fed by groundwater held in chalk aquifer
- Generally narrow and shallow
- Lush margins
- Biodiverse and wildlife rich

Ecology

Chalk streams are fed from underground aquifers and rise through chalk bedrock, making the water alkaline. This alkalinity gives chalk streams a particular character and ecology. The filter process ensures the water is clear, pure, and fortified with many inorganic nutrients that provide essential building blocks for life. These characteristics allow a huge diversity of aquatic plants to thrive, supporting many fish, invertebrates, and other species.

Healthy chalk streams are the most biodiverse of all English rivers and a vitally important habitat for distinct flora and fauna communities. Chalk streams are often dominated in mid-channel by river water crowfoot and starworts, and along the edges by watercress and lesser water-parsnip. The channel margins feature reed canary grass, reed sweetgrass, drifts of common reed and tall, vibrant stands of the spear-leaved bur reed.

Chalk streams feature abundant and diverse invertebrate communities, such as upwinged mayflies, stoneflies, caddis flies and beetles, crusteceans, molluscs, leeches, flatworms and round worms. The Chilterns rivers support nationally rare winterbourne species such as the Scarce purple dun mayfly and Winterbourne stonefly.

Fish life is a key part of the chalk stream ecosystem. A healthy chalk stream holds a good number of fish species such as brown trout, grayling, bullhead and minnow.

Other wildlife found in and around chalk streams include numerous birds such as reed bunting, kingfisher, little egret and grey heron, and mammals such as water voles, otters, and water shrew.

Example of good winterbourne habitat along Hamble brook.

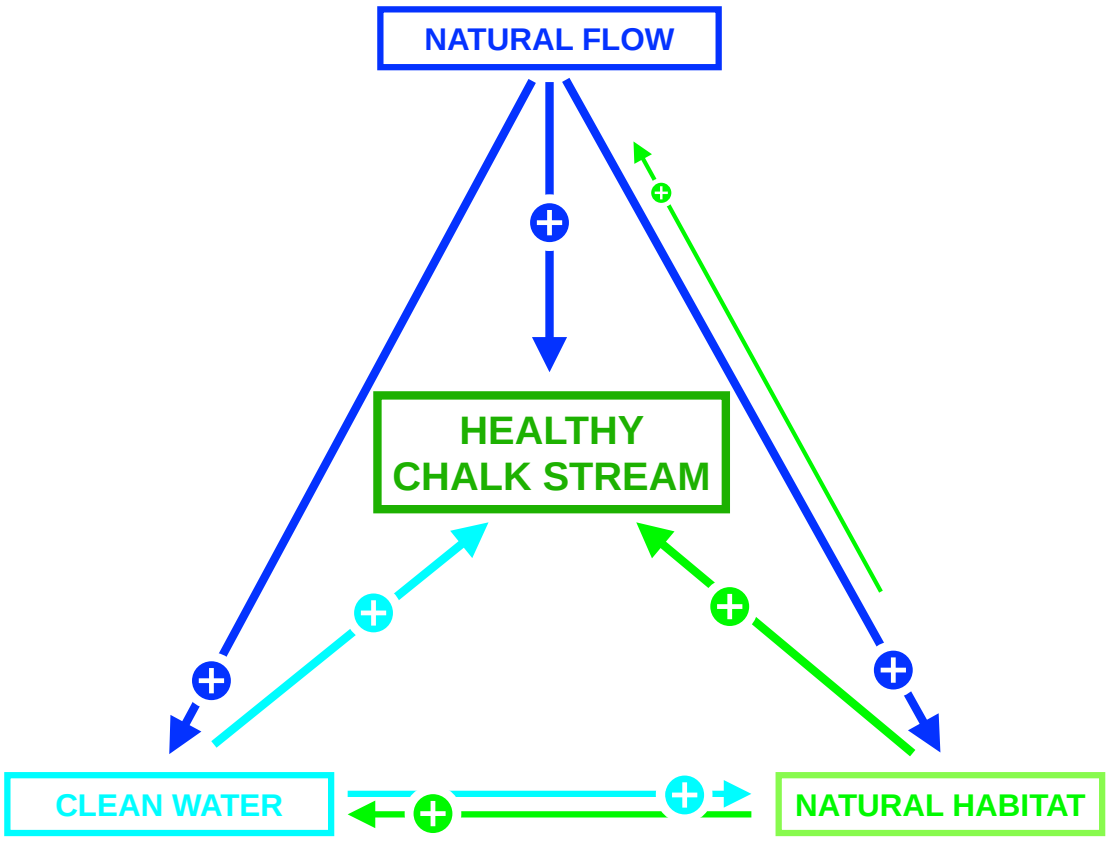
Trinity of ecological health

Unfortunately, many chalk streams, including those within the Chilterns, are in poor ecological health. The national Chalk Streams Restoration Strategy (2021) introduces the concept of the “trinity of ecological health”. Chalk-stream ecological health depends on three things.

- water quantity (the naturalness of the flow regime)
- water quality (how clean the water is)
- physical habitat quality (the physical shape of the river, but incorporating biological factors like invasive species which can degrade habitat directly and indirectly)

The Strategy addresses each in turn and all three in combination. Looking at these aspects individually helps focus actions. But looking at all three together shows how each one either positively or negatively affects the others.

Re-naturalising flow will improve river health by improving water quality and physical habitat. But the benefit of re-naturalising flow is greatly increased if water quality and physical habitat are improved too. Improving water quality or physical habitat will likewise enhance the health of the chalk stream, although not as much as when flow is also re-naturalised. Therefore, the best restoration strategy will address all three together: re-naturalising flow and improving water quality while using landscape-scale physical-habitat improvements to consolidate the beneficial impacts of both and thus deliver maximum ecological improvement. Combining all three will achieve this outcome much more effectively than when the elements are only improved in isolation.



Trinity of Ecological Health Diagram (CaBA Chalk Streams Restoration Strategy 2021)

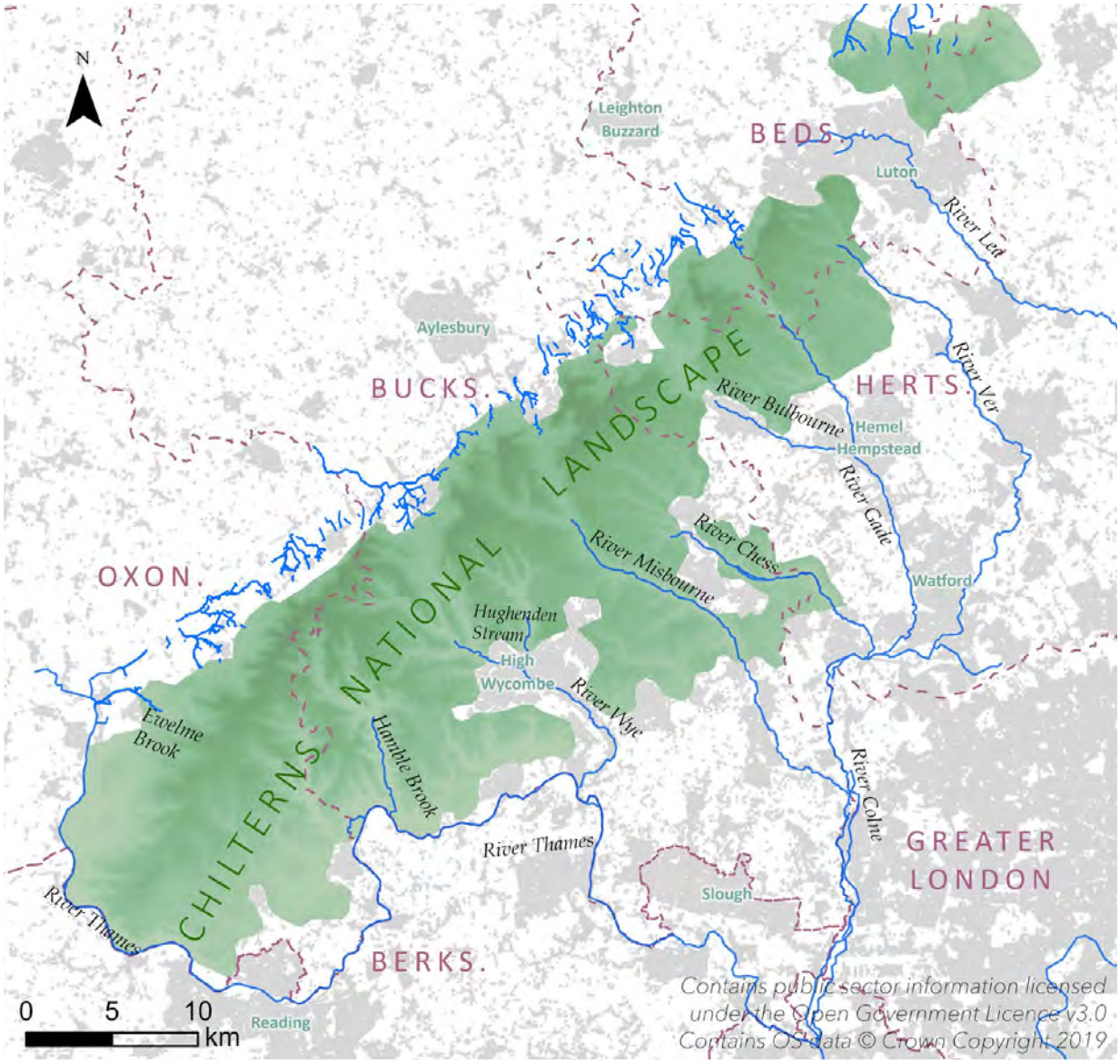
Chilterns Chalk Streams: Locations and types of chalk streams

The Chilterns is home to some of the world's most beautiful and picturesque chalk streams. The total length of chalk stream within the Chilterns National Landscape is approximately 60km. However, the total length of all chalk streams that rise within the National Landscape (and from Chilterns Chalk just beyond the boundary) is closer to 250km [1].

The exact length of chalk streams is also difficult to discern as it will vary over the course of a year as many of the rivers have ephemerally flowing sections known as winterbournes. Winterbournes are generally found in the upper reaches of chalk streams and begin to flow, as the name suggests, during winter as groundwater levels rise. The overall length of a winterbourne is at its greatest in the spring when groundwater levels peak and as levels drop through summer their flow declines and they begin to dry up. The fluctuating wet/dry nature of winterbournes supports specifically adapted species that thrive in this shifting environment. Indeed, some of the rarest species found in chalk streams are winterbourne specialists.

There are nine principal chalk streams which have their sources within the Chilterns and a large number of smaller chalk streams (listed page 5) that rise from the foot of the north-facing escarpment. These are shown in the map below. None of the principal nine chalk streams are assessed as attaining Good Ecological Status or Potential and of the smaller scarp slope streams just two are at Good Ecological status; the Eaton Bray and Hexton Brooks. The location and key characteristics of the principal chalk streams are summarised below:

1 The exact figures are not currently known due to mapping inconsistencies (for example there are inconsistencies in how scarp slope streams have been mapped by Natural England).



Definitive Chalk rivers Map

River Ver

The River Ver rises at Kensworth Lynch near Markyate and flows southeast for 27km through Redbourn, where it is joined by the River Red, then through St Albans and Park Street to join the Colne near Bricket Wood. Flowing through both historic settlements and rural farmland, the Ver supports a population of brown trout throughout its course and in its middle reaches provides valuable habitat and feeding grounds for a variety of birds such as jack snipe, water rail, sedge warbler and even osprey on occasion.

Low flows are the key issue faced by the River Ver, largely as a result of high rates of abstraction for public supply as well as climate change. Abstraction reductions at Friar's Wash and Bow Bridge have been carried out to improve flows, in recent years and Affinity Water are planning a further abstraction reduction at Holywell Hill in St Albans in 2024. There are also planned improvements for the River Ver through St. Albans through the River Ver Restoration project. In addition to low flows, the river does suffer from pollution from urban and rural sources and particularly from intermittent sewage spills entering the river from Markyate sewage treatment works. The Ver currently has moderate ecological status.

River Ver

River Gade

The River Gade rises from springs at Hudnall Corner and flows south east for 25.7km through Great Gaddesden, Hemel Hempstead, Kings Langley then along the west side of Watford through Cassiobury Park to join the Colne near Rickmansworth.

The River Gade, upstream of its confluence with the Grand Union Canal at Hemel Hempstead is a high quality chalk stream supporting populations of mayflies, caddisflies, trout and grayling. In its lower reaches, downstream of its confluence with the Bulbourne, the river is deep and silty and there are fewer invertebrates and some coarse fish, such as roach, chub, perch, bream and carp. Both the upper and lower sections of the Gade are assessed as having poor ecological status.

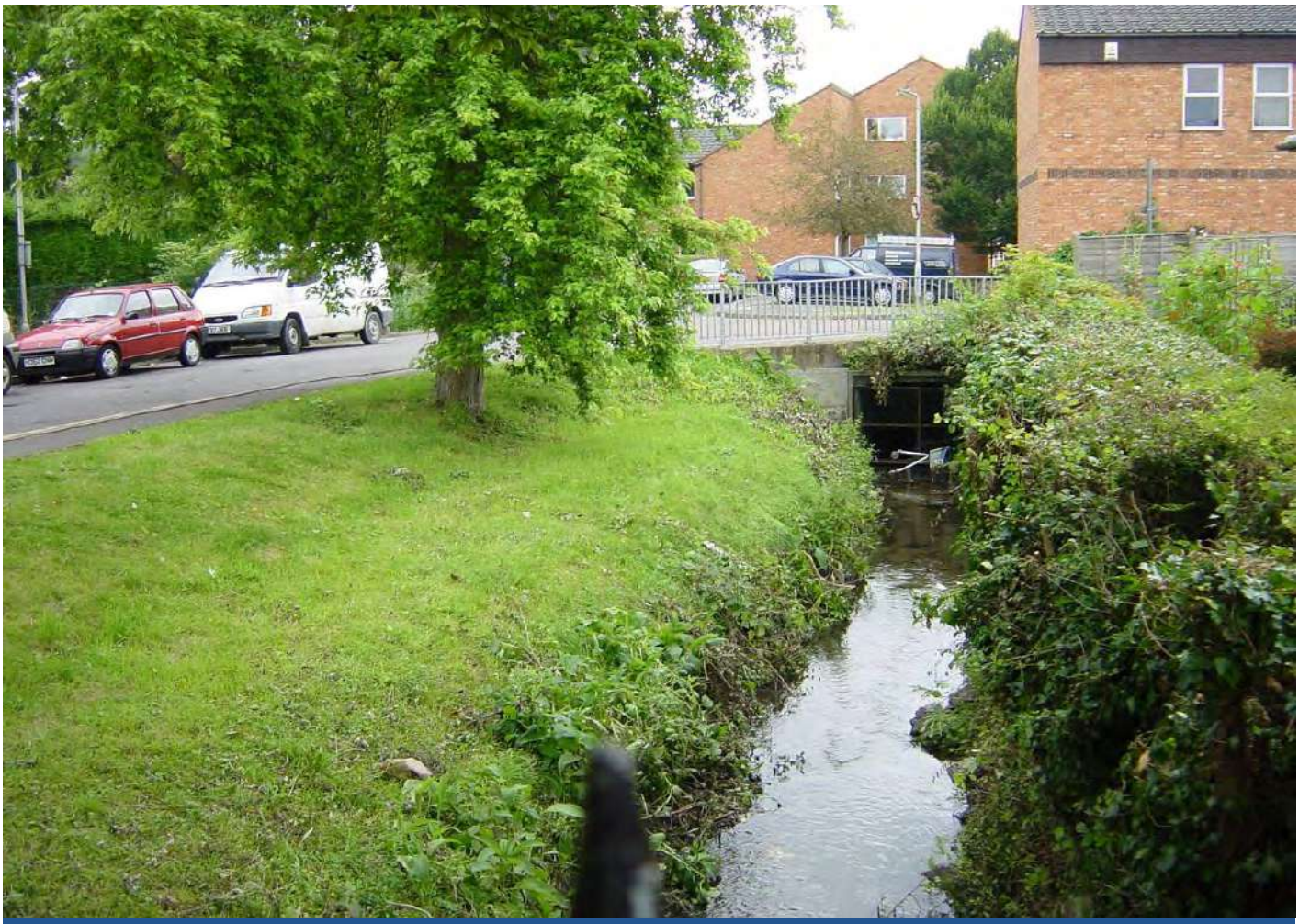
Of all the Chilterns streams the Gade has perhaps suffered the greatest damage by human activity. In addition to abstraction, physical modification and culverting suffered by many of the Chilterns Streams, in several places the Gade joins, and is lost entirely to the Grand Union Canal. Along the Gade, there are weirs and other historical in-stream man-made structures that act as barriers to fish, and cause siltation.

River Gade deculverted and restored as part of Riverside Shopping Centre improvements - Hemel Hempstead

River Bulbourne

A tributary of the River Gade, the River Bulbourne rises at Cow Roast near Dudswell and flows for 11.4km alongside the Grand Union Canal through Berkhamsted, joining the Gade at Two Waters, Hemel Hempstead. The Bulbourne has a small tributary – the Bourne Gutter, which is entirely winterbourne and only flows during times of high groundwater. Flows in the upper Bulbourne are strongly influenced by groundwater abstraction for the Grand Union Canal and for drinking water. The Bulbourne provides valuable habitat for a range of wildlife throughout its length including, bullhead, water voles and otter as well as providing a valuable amenity for local communities.

Like the Gade the River Bulbourne is a highly modified river as a result of urban development and the Grand Union Canal, into which it flows in Berkhamsted. Upstream of this confluence, it is vulnerable to drying up, whereas downstream, flow and water quality are dependent on outflow from the canal. It is currently assessed as having poor ecological status. Environment Agency modelling suggests that 96% of phosphorus in the Bulbourne currently arises from wastewater treatment; urban runoff being the second largest contributor.



River Bulbourne - Greenfield Road, Berkhamstead

River Chess

The River Chess rises from a number of sources around Chesham and flows for 17.7km through the Chilterns National Landscape past Latimer, Sarratt and Loudwater to meet the River Colne in Rickmansworth. Historically, the river was famous for its watercress beds and water mills, which once supplied paper for the London Illustrated News.

The Chess is a highly biodiverse river supporting a range of wildlife throughout its course including, grayling, trout, brook lamprey, mayflies and water shrew. In its headwaters, the Chess supports the nationally rare winterbourne stonefly and is one of two Chilterns rivers to support an extant population of water voles.

The health of the Chess is affected by issues such as abstraction for public supply, pollution, development and habitat loss. In its upper reaches, urban and agricultural runoff impact water and habitat quality and the river has been extensively modified and culverted under Chesham town centre. Further downstream, water quality is impacted by nutrient enrichment and intermitted storm sewage discharges from Chesham and Chenies sewage treatment works. Close to its confluence, major weirs significantly disrupt connectivity with the River Colne. The Chess is currently assessed as having moderate ecological status.

The Chess Smarter Water Catchment project started in 2021 with the vision of making the River Chess catchment a jewel in the heart of the Chilterns landscape. The project is tackling the issues that face the river and its catchment through partnership working.

River Chess - Sarratt Bottom

River Misbourne

The River Misbourne rises at Mobwell Pond near Great Missenden and flows for 27km through the Missendens, Amersham, and the Chalfonts before passing under the M25 motorway and through Denham village to its confluence with the River Colne just north of A40 Western Avenue.

The Misbourne is unusual in that along with its winterbourne headwaters, it also has an intermittently flowing middle section between Amersham and Chalfont St. Peter. Historically, the Misbourne has been badly impacted by low flows due to abstraction and drought. Since 1997 however, abstraction has been reduced significantly and flows in the upper river have recovered. The river's health is also affected periodically by sewage discharges at Gerrard's Cross sewage treatment works and Amersham, particularly when groundwater levels are high, and by the volume of polluting road run-off from the major A413 road to Aylesbury which follows the valley for much of its length. Aside from impacts to water quality, the Misbourne has suffered from widespread physical modification for a variety of reasons such as milling, ornamental landscaping and urban development. As well as culverting under the M25 and at Great Missenden, the river has even been placed in culvert beneath Chalfont St. Peter, which effectively isolates the upper river from its lower reaches. Despite these issues, the river supports pollution sensitive species such as the grannom caddisfly and green drake mayfly along with fish species such as brown trout and the 10-spined stickleback. The river also supports valuable wetland habitats providing wintering grounds for waterfowl such as teal and gadwall. The River Misbourne is assessed as having poor ecological status.

River Misbourne - Doctors Meadow, Little Missenden

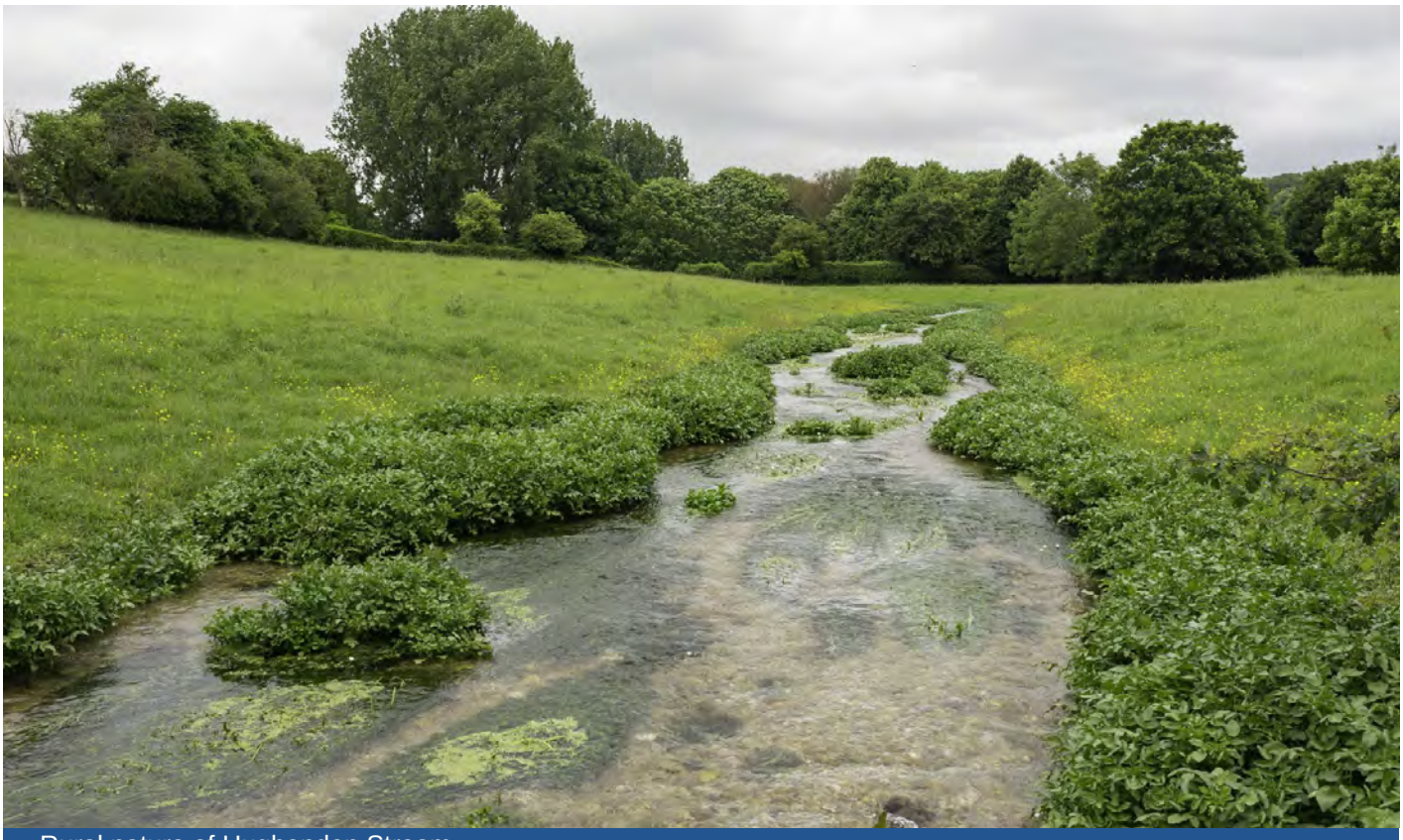
Hughenden Stream

The Hughenden stream rises from springs in the village of Hughenden Valley and flows for 3.6km through Hughenden Manor and Hughenden Park, joining the River Wye in High Wycombe town centre.

The Hughenden Stream is an ephemeral winterbourne chalk stream periodically drying completely when groundwater levels are low. The stream has been impacted significantly by the construction of weirs as part of the ornamental landscaping of the Hughenden Manor Estate in the 19th Century and by the expansion of High Wycombe town. This development has led to the stream being heavily modified, its course altered and placed in culvert in several locations. Indeed, the river is ecologically isolated from the River Wye due to both being in culvert for approximately 240m at their confluence under the town centre.

Although naturally ephemeral, flows in the Hughenden Stream have in the past been affected by abstraction for public water supply. However, abstraction reduction along the River Wye and the closure of Hughenden pumping station in 2018 have improved flow resilience. The Hughenden Stream is currently assessed as having moderate ecological status.

Urban culvert - Hughenden Stream



Rural nature of Hughenden Stream

River Wye

The River Wye rises near West Wycombe and flows for 16.8km through High Wycombe, Loudwater and Wooburn Green before joining the River Thames at Bourne End, above Cookham Lock. The river has two main tributaries, the Hughenden Stream and the Wycombe Marsh Brook, which like the Wye, are fed from springs that rise up through the Chiltern chalk.

The Wye is historically very important. It was instrumental in the founding of the towns and villages in the valley, providing food and water and driving, at one time, over 30 water mills along its course. There is still a legacy of weirs resulting from the history of milling and that this presents barriers to the movement of fish and other wildlife.

Extensive urban development in the valley led the river to become highly modified and, at one time, quite polluted. The river is culverted underneath High Wycombe Town Centre for around 850 metres which effectively cuts the lower river off from both its headwaters and the Hughenden Stream. This is a major barrier for fish and other wildlife. Development has also increased demand for water and led to the river suffering from low flows. To address this problem, Thames Water reduced abstraction at two locations in 2005 and in 2020. Flow in the river is also augmented by treated effluent, which is pumped into the river from Little Marlow sewage treatment works in compensation for closure of the treatment works at Wycombe Marsh in 2003.

Although altered by many centuries of human activity, the River Wye is still an extremely valuable habitat and corridor for wildlife through what is a predominantly urban catchment. The river supports both coarse and salmonid fish, otters and invertebrates such as the beautiful demoiselle and blue-winged olive fly.

There is a distinct cut-off between the upper and lower sections of the river. The upper River Wye is currently assessed as having moderate ecological status whilst the lower river is assessed as poor.

River Wye at Wycombe Retail Park

Hamble Brook

The Hamble Brook flows for 7km through the rural Hambleden valley to the north of Henley where it joins the River Thames just downstream of Hambleden Lock. The Hamble Brook is an example of a winterbourne and is sometimes dry along its entire length. The river has been diverted away from its original course in places, and even away from the natural floodplain.

Multiple modifications over the years such as for ornamental landscaping and flood alleviation, have impacted on the brook's natural function and ecology.

It is currently assessed as having poor ecological status due to poor fish and invertebrate populations and aquatic plant communities. However, despite this, the brook supports two nationally rare species, the winterbourne stonefly and scarce purple dun mayfly, which were only discovered in 2023.

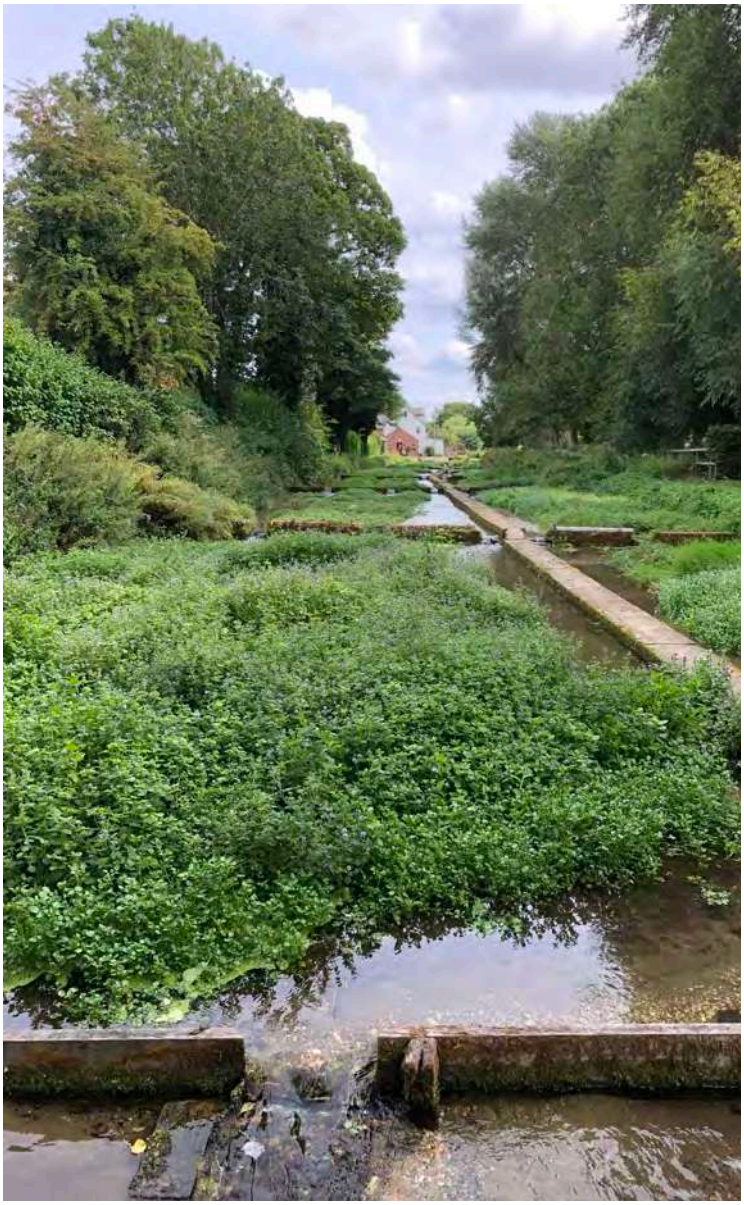
Hamble Brook - Hambleden

Ewelme Brook

The Ewelme Brook is a small chalk stream that rises from the spring line at the foot of the chalk escarpment at King's Pool in Ewelme and flows for 3.8km to its confluence with the River Thames at Benson, near Wallingford. There is an approximately 270m long culvert between Ewelme and Benson.

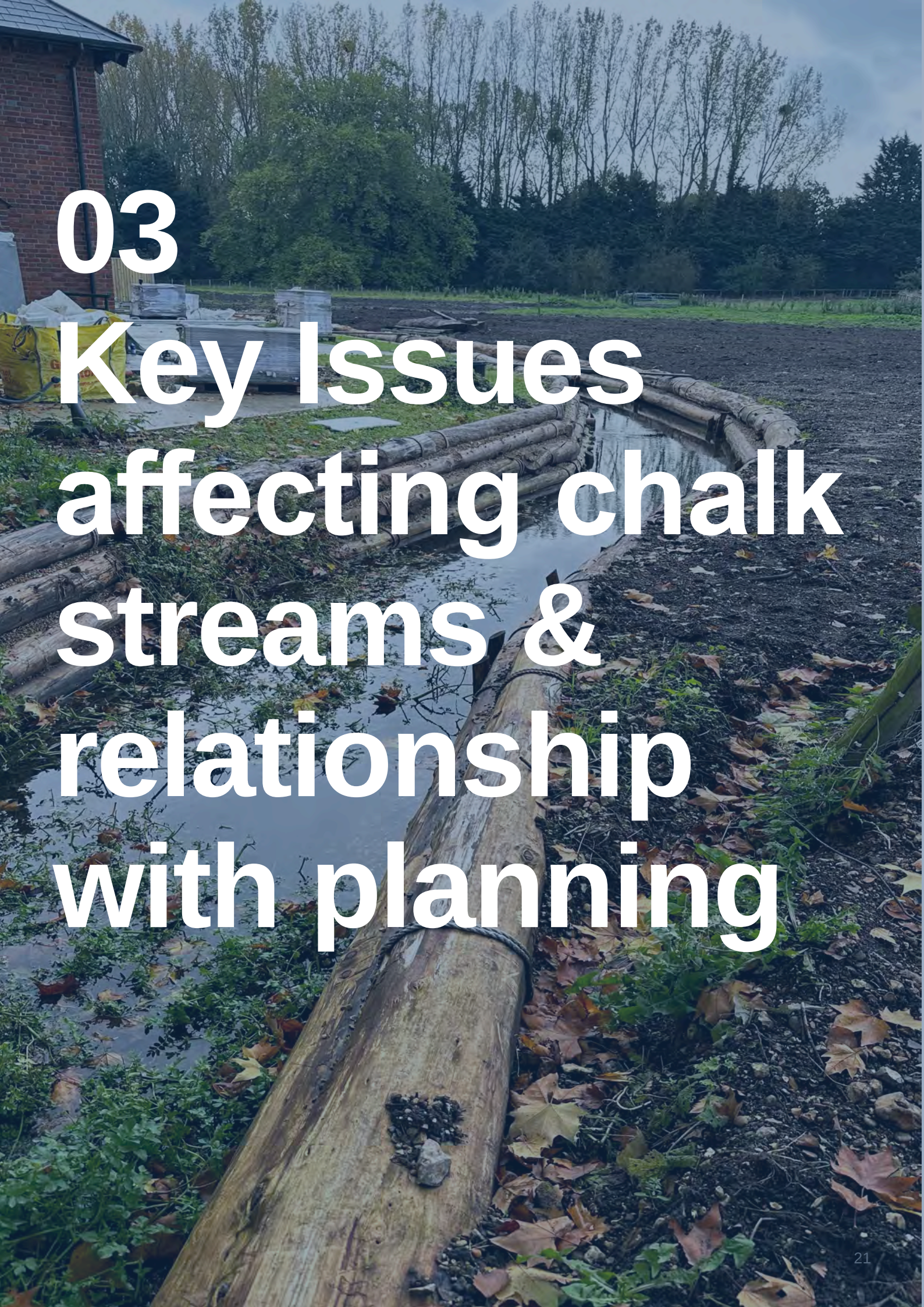
Historically, the brook was used for milling and watercress growing. The watercress beds at Ewelme are now a local nature reserve owned by the Chiltern Society.

The brook flows mainly alongside roads which drain into it at many locations. As a result, the brook suffers from intermittent pollution and sediment ingress. It is also highly modified for much of its length with long sections being straightened with reinforced banks. There are many small culverts and footbridges along with old mill sites in Benson and Ewelme which act as barriers to wildlife. Despite these pressures, the Ewelme Brook supports a small population of brown trout and otter are regularly seen along its banks. The Ewelme Brook is currently assessed as having moderate ecological status.



Ewelme Watercress Beds

Ewelme Brook credit John Morris



03 Key Issues affecting chalk streams & relationship with planning

Key Issues affecting chalk streams & relationship with planning

As has been established the chalk streams of the Chilterns are in a generally poor and declining state. The reasons behind this are numerous and complex but the key issues affecting chalk stream health are:

- abstraction
- pollution and run off
- physical modification
- invasive non-native species
- climate change

Land use planning decisions can ameliorate or exacerbate all these issues. This section of the guidance summarises each area of concern and notes how this is related to planning.

Abstraction

Water abstraction takes or extracts water from a natural source (rivers, lakes, groundwater aquifers, etc.) for various human uses - from drinking to irrigation, treatment, and industrial applications. In the Chilterns, abstraction for domestic water supply is exclusively from groundwater. An unsustainable level of abstraction disrupts river flow and groundwater levels, undermining rivers' healthy ecology, removing their natural resilience to drought, and diminishing their value for supporting wellbeing and recreation. Reduced, or sustainable, water abstraction is essential to ensure that river flows and groundwater levels support ecology and natural resilience.

Abstraction has the biggest impact on rivers during the summer and during droughts. This is because water demand rises sharply, increasing abstraction rates closer to licensed limits at a time when river flows are already depressed due to low groundwater levels. During drier months, chalk streams are seen to be regularly over-abstracted. As climate change raises the risk of dry summers (see below), this scenario is likely to become increasingly prevalent. Drier summers are likely to lead to increased demand for water from water-hungry users, which, in turn, will increase levels of abstraction.

The Chilterns area has some of the highest per capita demand for domestic water in the UK. Significant lengths of chalk streams in the Chilterns have completely dried out for several years at a stretch because of over-abstraction. While there has been a significant reduction in abstraction levels in a number of Chilterns catchments, abstraction levels are still high and impact on river flows. Until alternative sources of water can be developed, the impact of drought and increasing water demand resulting from climate change, development and profligate use, will continue to negatively affect chalk stream flows.

The issue of abstraction can be addressed by planners, as well as those that work or look after land. Engagement with water companies and the EA as part of preparing development plans can assist with water resourcing planning and setting ambitious water consumption targets. Reducing the demand for water from new developments can also help to ensure that abstraction is kept within sustainable levels.

Pollution and run off

Chalk streams' unique hydrology means that they do not rely on surface water run-off. Rivers are formed, instead, where water springs from the ground, having percolated through the underlying chalk bedrock.

However, a growing problem for chalk streams, has been the rise of pollution as soil, sediment, fertilisers and chemical residues can be washed into rivers off the land by rain or weathering. These come from three key sources:

- Urban diffuse pollution, including run-off from roads
- Sewage
- Agriculture

Nationally, 30% of chalk streams found to be failing in relation to the Water Framework Directive, had as their primary reason for failure to be one of these forms of pollution

Polluted run-off - Duck Alley, Chesham

Urban diffuse pollution, including run-off from roads

Urban diffuse pollution includes run-off from roads, roofs and pavements and contains a high number of fine sediments. This form of pollution also carries potentially toxic chemicals from human activities, such as copper from car brake pads and zinc from car tyre wear. A growing and urbanising population will likely cause an increase in the prevalence of this type of pollution. Without careful planning to ensure run-off is captured and treated at source, the urbanisation of river valleys will increase the amount of polluting run-off flowing into chalk streams, further damaging them and increasing downstream flood risk.

Sewage

Sewage pollution includes nutrient-rich treated effluent, permitted storm sewage overflows or unregulated, illegal pollution from sanitary waste or other toxic substances. This area of pollution is largely the product of water and sewerage companies. There are also misconnections into the surface water drainage system. This is a major issue for the lower Bulbourne. Many of the biggest wastewater discharges occur when raw sewage overflows from inundated treatment works during wet weather (both those that are 'permitted' and illegal pollution incidents). In addition, unregulated small discharges from septic tanks in rural areas continue to blight chalk streams. Surcharging of raw sewage as a result of groundwater infiltration of the sewer network can be a major issue within the Chilterns. Surcharges can (and have) directly flown into rivers. Overpumping of sewers into chalk streams during high groundwater has caused problems for several streams, including the Misbourne and Hughenden Stream.

Agriculture

Agricultural pollution includes farming and other rural land use producing pollutants from fertilisers, manures, pesticides and soils washing into streams when it rains or percolating into the groundwater. Other pressures from agriculture include deepening, widening or re-routing of streams for land drainage, gravel removal and bankside erosion. Although there are regulations which govern agricultural pollution, linked to farming subsidies, there can be poor levels of compliance, meaning poor practices linked soil and erosion problems continue. Roads can also provide a vector for agricultural run-off.

Planning has a key role to play in managing surface water, particularly with regards to urban diffuse pollution and sewage pollution. Surface water management to support chalk streams should be a key consideration in planning decisions. Local Planning Authorities and water companies have joint responsibilities in planning for wastewater management, at plan-making and when determining planning applications. Planners must take account of whether there is capacity to treat sewage that will result from planned development. This is essential to reduce the amount of storm sewage overflows.

Physical modification

A chalk stream's shape, form and connectivity – its 'geomorphology' –fuels its health and biodiversity. A geomorphologically diverse and naturally functioning river is far more able to tolerate pollution and abstraction than a heavily modified one.

Yet almost all chalk streams have been modified to some extent over the course of history, some more than others. Chalk streams would originally have had braided channels and a connected floodplain, but many have been confined to a single channel and have been disconnected from their natural floodplain. In fact under the Water Framework Directive, two-fifths of chalk streams are classified as 'Heavily Modified Water Bodies' and 2% are deemed to have been so modified as to become 'Artificial Water Bodies'

These modifications have several ways of impacting on chalk streams' health and vitality. Confined, straightened or impounded streams are not able to cope with floods and droughts in the same way a natural river can. Modified rivers are often less able to cope with high flows as their channel capacity is reduced or flood water is unable to flow back into perched or embanked channels. Channels that have been modified for flood water conveyance often fill with sediment between flooding events and so cannot accommodate high flows.

Pollutants can more easily enter a modified system without the natural buffer of bankside vegetation, and once there, tend to become trapped in a river that has lost its meandering shape and faster flows. The insertion of structures within the stream, such as weirs and sluices, provide further blockages that trap sediment in the river and prevent wildlife from migrating along the river or recolonising headwaters that periodically dry. Some modifications connecting chalk streams with man-made waterways also disrupt the biological make-up of the stream as warm, silty, nutrient-rich, turbid water enters. Chalk streams are also low-energy systems and are therefore mostly incapable of recovering to a more natural state once they have been modified. Modified channels, particularly in chalk stream headwaters are also more vulnerable to drying events as a lack of vegetated margins prevents the channel width from adjusting to the reduced flows. Modifications therefore accumulate over time and lock in increasingly degraded chalk stream habitat..

The Environment Agency identified physical modification as the primary reason for over a third of failing chalk streams not meeting 'Good' status. Many more have physical modification as a secondary reason for failure. This places modification as the most commonly attributed cause of chalk stream failure across the country.

Where development is proposed in areas close to modified chalk streams planning can help to address this issue and seek, as part of development, to return the river to a more natural state.

Example of culvert along the Misbourne River

Invasive non-native species

Chalk streams support diverse invertebrate communities, which in turn sustain large fish populations, including species popular with anglers, such as brown trout and grayling. They are also perfect habitats for animals like the otter and water vole, which are key conservation species.

Himalayan Balsam

However, non-native plants and animals which have escaped or been introduced into the British countryside are causing disruption and, in some cases, destruction. Development along river corridors can often facilitate the establishment of non-native species, through the unintentional introduction of species, or the spread of species around a development site, Poorly planned development that leads to the isolation of the river corridor by boundary fencing can also lead to sections of river bank that are not actively managed or provide a convenient dumping ground for waste. This can allow non-native species to become established and to spread downstream.

Plants like Japanese Knotweed and Himalayan Balsam blanket river banks, preventing growth of native plants and leave banks vulnerable to erosion when they die back in the winter. American mink have preyed upon water voles to near extinction in the Chilterns, although there has been a recent recovery. American Signal Crayfish have acted as a carrier of crayfish plague which has decimated populations of the native white clawed crayfish, leading to its extinction locally. Other non-native species causing disruption in Chilterns chalk streams include the demon shrimp, giant hogweed, Australian swamp stonecrop, and floating pennywort.

As climate change continues apace (see below) the influx of non-native species may pose an even greater threat to the health of Chilterns chalk streams. Where development is proposed near a chalk stream this offers an opportunity to tackle and remove invasive species that may be present on site.

Climate change

As with many ecosystems, chalk streams are severely threatened on multiple fronts by a changing climate. Its effects are already with us. Temperatures are increasing, including hotter summers and milder winters. Extreme events including floods, droughts and heatwaves are increasing. Despite the stabilising influence of groundwater on water temperatures and flows, chalk streams are changing in response to these climatic shifts.

Groundwater up-welling

Biodiversity is expected to decline with negative impacts on fish, invertebrates, plants, algae and microorganisms. This will be triggered by a loss of coldwater fish and other species to feed off and shifts in the timing of lifecycle events that affect survival and the recruitment of future generations. New invasive non-native species are expected to arrive (see above), and the distribution of existing such species is likely to change. Species at risk include migratory salmonids, eel and lamprey, remaining populations of native, white-clawed crayfish, and nationally rare specialist insects whose lifecycles are timed to coincide with the wet and dry phases of winterbourne flow regimes.

Of particular concern, climate change will likely serve to interact with existing or ongoing challenges to chalk streams to the detriment of these rivers. Rising temperatures would exacerbate the problem of abstraction (see above) making the threat of drought particularly high. Extreme events such as storms and floods will become more common but physical modifications to chalk streams (see above) make them less able to handle such changes in water flow.

Planning has a role to play in responding to climate change more widely, but also in the context of chalk streams. Any action taken as part of development to improve chalk streams should consider climate change and how current interventions may need to be altered in the future.

04 Planning policy in relation to chalk streams

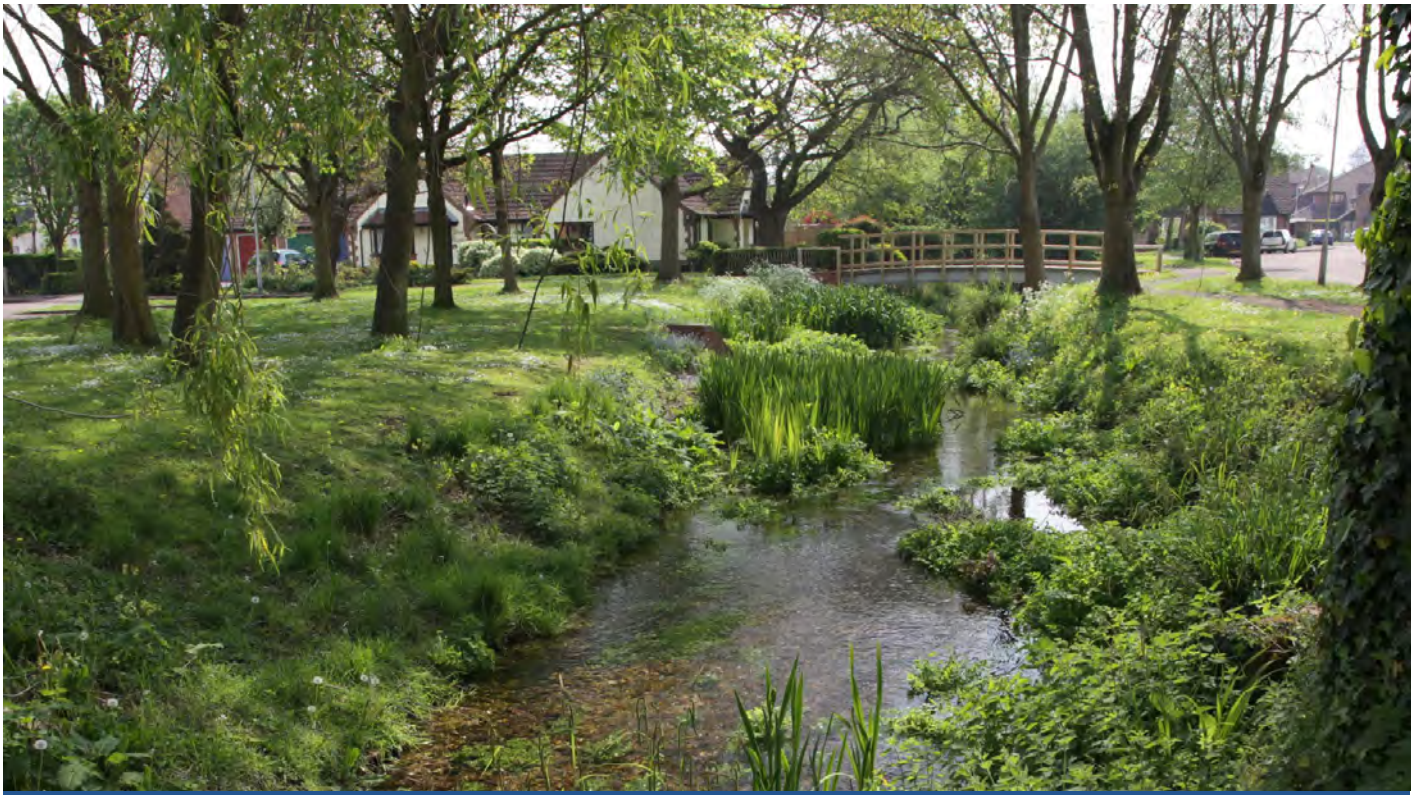
National policy

There is no explicit reference to chalk streams in the National Planning Policy Framework (NPPF). However, the NPPF does require plan makers to consider:

- water supply and wastewater as key aspects of infrastructure to support the Plan
- taking a proactive approach to mitigating and adapting to climate change taking into account long term implications for water supply
- enhancing the natural and local environment by preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of water pollution
- encouraging development to help improve water quality, taking into account relevant information such as river basin management plans.
- protection and enhancement of sites of biodiversity value (commensurate with their statutory status or identified quality in the development plan)

The NPPF sets out requirements for Local Plans and decision makers to protect and enhance the natural environment. It contains several clear paragraphs relating to National Landscapes. There are strict controls on the scale, type and nature of development that can take place within National Landscapes. Decision makers are required to give great weight to the conservation and enhancement of National Landscapes, and the scale and extent of development is expected to be limited.

The Planning Practice Guidance provides more detailed information on how Local Planning Authorities should consider water supply, wastewater and water quality in their Local Plans. The main focus is on ensuring that Plans have due regard to the relevant River Basin Management Plan. The relevant plan for areas within the Chilterns National Landscape is the Thames River Basin Management Plan.



Housing estate with space made for the River Bulbourne, Northchurch

Local planning policy

The Chilterns National Landscape relies on local planning authorities to protect and enhance the National Landscape through their Local Plans, and the implementation of planning policy. The Local Planning Authorities producing Local Plans across the designated area of the Chilterns and immediately adjacent to it are:

- Oxfordshire County Council: Minerals and Waste Local Plan; Local Transport Plan.
- South Oxfordshire District Council: Local Plan.
- Buckinghamshire Council: Local plan; Minerals and Waste Local Plan; Local Transport Plan.
- Central Bedfordshire Council: Local Plan; Minerals and Waste Local Plan; Local Transport Plan.
- Luton Borough Council: Local Plan; Minerals and Waste Local Plan; Local Transport Plan.
- Hertfordshire County Council: Minerals and Waste Local Plan; Local Transport Plan.
- Dacorum Borough Council: Local Plan.
- North Hertfordshire District Council: Local Plan.
- Three Rivers District Council: Local Plan.
- Reading Borough Council: Local Plan; Minerals and Waste Local Plans; Local Transport Plan.
- West Berkshire Council: Local Plan; Minerals and Waste Local Plans; Local Transport Plan.
- Wokingham Borough Council: Local Plan; Minerals and Waste Local Plans; Local Transport Plan.
- Royal Borough of Windsor and Maidenhead: Local Plan; Minerals and Waste Local Plans; Local Transport Plan.

It is expected that all these authorities will have regard to this document in their plan making activities. Other plan making authorities may also find this guidance useful in supporting them in line with their obligations under the Levelling Up & Regeneration Act to facilitate the protection and enhancement of chalk streams as a key quality of the Chilterns National Landscape.

Local plans should not repeat national policy but can, and should, set strategic policies and development management policies for the local area.

Some of the extant local plans refer to chalk streams within the supporting and contextual text of the plan, but currently none of the local plans has a policy specifically relating to chalk streams.

River Ver - St Albans

There are several emerging Local Plans which are seeking to include policies relating to water courses and chalk streams. The National Landscape are supportive of these policies and will seek to support Local Authorities proposing policies that accord with the advice provided in this Guidance.

Drafting local planning policy in relation to chalk streams

When drafting a Local Plan, Local Planning Authorities must ensure that their plan accurately and adequately addresses the presence of chalk streams in their area. This is an important way to demonstrate how the Authority is seeking to further the purposes of the National Landscape and recognises the status of these streams as Priority Habitats. Rather than suggesting the inclusion of a single “chalk stream” policy, it is recommended that Authorities reflect on how the presence of chalk streams in their area should be interwoven throughout the Local Plan through its vision, objectives, policies, and supporting text.

Vision & Objectives

The Local Plan must contain a vision which should be aspirational but realistic. The objectives should support the delivery of the spatial vision. Chalk streams, as a globally rare habitat, are anticipated to be worthy of inclusion in all Local Plan visions where they are present. Authorities may choose to include a chalk stream related objective or to reference their protection and enhancement within a wider objective relating to the water environment.

Policies

It is anticipated that all Local Plans produced by Authorities within and adjacent to the Chilterns National Landscape will include policies relating to the National Landscape, the natural environment, particular habitats and species, the water environment and chalk streams. The exact wording and number of policies will be unique to the Plan being produced. Authorities may choose to combine certain policies or prepare distinct polices across a wider range of topics. The sub-sections below provide guidance on the key policy considerations where reference and protection for chalk streams could be inserted within a Local Plan.

National Landscape policies

Local plans should set out a policy in relation to the Chilterns National Landscape. The management plan for the Chilterns National Landscape sets out a policy containing criteria that Local Planning Authorities should consider in order to give great weight to conserving and enhancing the National Landscape. It suggests that development should be rejected unless it meets the following criteria:

- it is a use appropriate to its location,
- it is appropriate to local landscape character,
- it supports local distinctiveness,
- it respects heritage and historic landscapes,
- it enhances natural beauty,
- ecological and environmental impacts are acceptable
- there are no detrimental impacts on chalk streams,
- there is no harm to tranquillity through the generation of noise, motion and light that spoil quiet enjoyment or disturb wildlife, and
- there are no negative cumulative effects, including when considered with other plans and proposals

These criteria should be positively incorporated into a Local Plan policy relating to development within the Chilterns National Landscape. The policy and its supporting text should include specific reference to chalk streams as part of the reason for the National Landscape designation. The policy should name the chalk streams within the area.

Chalk stream policies

For Authorities containing areas of the Chilterns National Landscape, and those adjoining (where chalk streams flow from within the National Landscape) a specific policy relating to development near to, or affecting, chalk streams is likely to be necessary. The policy should encourage or require the following measures:

- Setting a specific “no development” buffer zone around chalk streams to avoid impacts to river corridors. The buffer is intended to address habitat enhancement in the immediate hinterland and applies to both banks of the watercourse. Within the National Landscape it is considered that a 15m “no development” buffer zone should be viewed as the minimum distance which is acceptable for chalk streams, and wider buffers should be encouraged. Legislation requires an 8m buffer for all watercourses, but it is widely accepted that the larger the buffer the better. The suggested 15m buffer recognises the heightened value of chalk streams. Further detail on design of proposed buffer zones is contained in the Development Management section of this document.
- De-culverting of river courses to improve water flow, water quality and to restore connectivity for habitats and species
- Removal of weirs and other barriers to fish and wildlife movements
- Appropriate management of run-off and drainage to ensure chalk streams are not polluted and that flood risk is not increased
- Landscaping and bank improvements, for example the renaturalisation of banks and re-establishment of natural channel features (vegetated margins, gravel riverbed, pool and riffle features). Recognition of the chalk aquifer and the importance of groundwater protection (including reference to groundwater protection zones where applicable)
- Incorporation of public access

These recommended interventions are explained in more detail in the Development Management section of this document

Example of appropriate buffer between river and development (River Wye)

Habitat and species policies

Chalk streams provide a rare and important habitat for a wide range of species, many of which are protected and priority species. Local Plans should ensure that chalk streams are specifically referred to in policies relating to the protection and enhancement of species.

Sustainable drainage policies

The NPPF encourages developments to incorporate sustainable drainage systems (SUDS). Local Plans should include a policy setting out the sustainable drainage hierarchy. Sustainable drainage systems should be designed not only for flood mitigation but also for pollutant reduction.

Infiltration SUDS (where appropriate) would help to recharge the aquifers upon which chalk streams rely, however, close attention must be paid to water quality. SUDS systems which drain directly, or via a surface water sewerage system to a chalk stream must ensure measures are in place to manage pollutants and avoid increasing fluvial flood risk. Detailed advice on designing SUDS to manage water quality are provided in the CIRIA SuDS manual. Local Plan policies should consider what the appropriate focus of the drainage hierarchy is bearing in mind the presence of chalk streams and source protection zones in their area. Any scheme should avoid unintended risks associated with SUDS, such as rising groundwater levels and groundwater flooding.

Policies should promote nature-based solutions to ensure that drainage systems work with nature to deliver multiple benefits. Nature-based solutions (such as green walls, green roofs and rain gardens) provide multifunctional benefits in managing multiple climate impacts such as flooding, drought, overheating and sequestering carbon. They can also provide social and economic benefits such as improving health and wellbeing and improving land and property value.

SuDS at Wye Dene Estate, High Wycombe

Water use/demand policies

As outlined earlier in this document, one of the main issues affecting chalk streams is scarcity of water and high levels of groundwater abstraction. Local Plans within and adjacent to the Chilterns National Landscape should encourage a reduction in water use in new developments to assist in ameliorating this issue. Authorities should consult the relevant Water Resource Management Plan (WRMP) for their area, for most authorities in the Chilterns area this will be the Thames Water WRMP.

Policy should require development to adopt the highest water-efficiency standards possible. Greywater, rainwater harvesting and storage, and sustainable drainage systems should all be required to reduce water demand, and education efforts should be encouraged. In chalk stream catchments, the CaBA chalk streams strategy recommends adoption of a policy requiring development to achieve mains water consumption not exceeding 90 litres per day. If this is not possible, Authorities should include a policy requiring 105 litres per day (plus 5 litres for external water consumption), which meets the higher optional building standards. Polices should include wording that encourages proposals to go further.

Policy should also be drafted to require BREEAM[1] excellent standard for water efficiency, or another appropriate measurement to ensure water efficiency. Other measures which should be encouraged include requiring rainwater harvesting.

1 Building Research Establishment Environmental Assessment Method

Site allocations and design policies

When considering site allocations Local Planning Authorities should consider the effects on chalk streams inside and outside the Chilterns National Landscape. This applies to all site allocations, not just those which may have a chalk stream within the site, or within close proximity.

Where sites are proposed for allocation, allocation policies should set out how impacts on chalk streams will be avoided, and where enhancements should take place. Consideration should also be given to if any interventions can form part of a wider scheme, in the short or longer term.

Local Plans are also likely to contain a policy relating to design. Whilst this policy will likely have a wider focus it should include reference to chalk streams and how these should be reflected in site design/ landscaping.

Interaction with Biodiversity Net Gain & the general biodiversity objective

Public authorities who operate in England must consider what they can do to conserve and enhance biodiversity in England. This is the strengthened 'biodiversity duty' that the Environment Act 2021 introduced. Authorities must consider what they can do to conserve and enhance biodiversity and agree policies and objectives based on this consideration.

From February 2024 development projects (apart from exempt developments) must deliver a minimum 10% increase in biodiversity value relative to the pre-development biodiversity value of the onsite habitat. This is known as Biodiversity Net Gain (BNG). The minimum 10% increase in biodiversity value applies to each of the terrestrial, hedgerow and watercourses elements.

The Planning Practice Guidance makes clear that Local Plans should not include policies which duplicate the provisions of the statutory framework. Local Plans could complement the Framework by including policies which support appropriate local offsite biodiversity sites. Local Plans should consider whether specific allocated sites for development should include biodiversity enhancements, to support other developments meet their net gain objectives in line with Local Nature Recovery Strategies. Local Plans should also consider whether the current status of rivers and chalk streams could be used as justification for higher BNG targets. Authorities should also consider whether offsite BNG credits could be used for works to improve chalk streams.

Local Planning Authorities should ensure that chalk streams and related habitats are fully and appropriately considered within frameworks for offsite BNG. They must also be satisfied that the metric for BNG is accurately applied for watercourses, including chalk stream. It should however be noted that both the River Ches and Misbourne are not entered as priority rivers by the EA mapping, and are instead listed as 'other river or stream'.

Ewelme Brook credit A.Porter

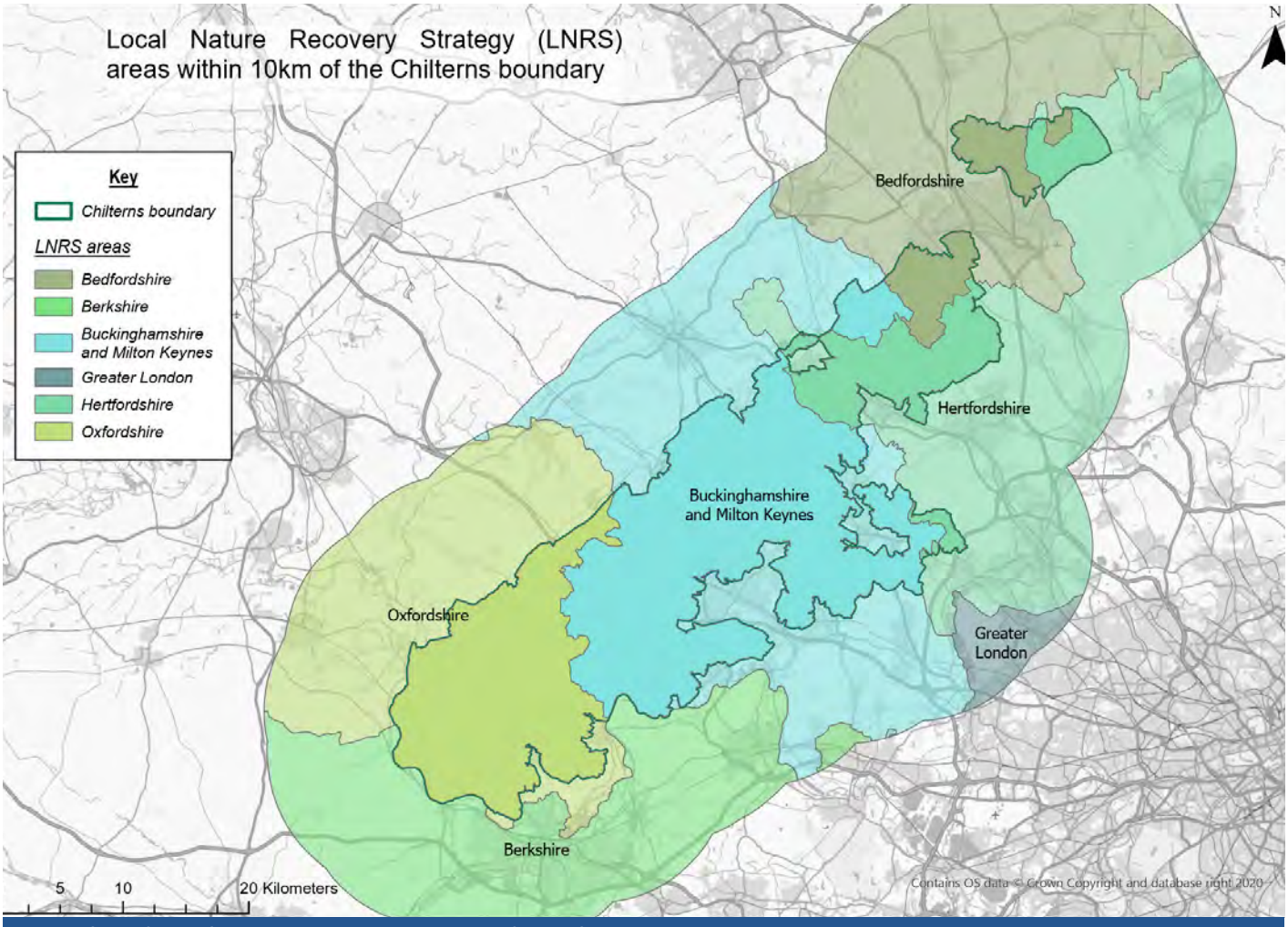
Ensuring sufficient links with other programmes

Local Plans should have regard to the Chiltern National Landscape Nature Recovery Plan. Useful information and guidance can also be found in the documents prepared by the Defra Catchment Partnerships. Within the Chilterns, these are prepared by Colne Catchment Action Network (ColneCAN) and the South Chilterns Catchment Partnership.

Local Nature Recovery Strategies (LNRS) are currently in the early stages of preparation, and it is likely that chalk streams will form a key part of strategic recovery within the Chilterns. Relevant LNRSs include

- The Buckinghamshire & Milton Keynes LNRS
- The Bedfordshire LNRS
- The Hertfordshire LNRS
- Cambridgeshire & Peterborough LNRS
- Oxfordshire LNRS

Local Planning Authorities should ensure that there are clear links between their relevant LNRS and their Local Plan, including recognising the role chalk streams can play in nature recovery.



Location of Local Nature Recovery Strategy (LNRS) areas

Neighbourhood Plans

Neighbourhood plans cannot deal with strategic policy but contain planning policies related to locally specific issues. Where neighbourhood plan areas contain chalk streams, Parish Councils and Neighbourhood Forums should consider including detailed policies relating to bank improvements (such as renaturalisation or regrading), removal of weirs and other barriers to fish movements, de-culverting and public access. Where a Neighbourhood Plan allocates sites that may affect a chalk stream, the guidance provided above in relation to site allocation will be equally appropriate. Further information on neighbourhood planning within the National Landscape can be found in the Chilterns National Landscape's toolkit for Neighbourhood Planning.

Monitoring

Local Planning Authorities are required to monitor policies within the local plan on at least an annual basis. Indicators used for monitoring should directly relate to the policy being assessed. It is not possible to provide specific criteria and indicators within this guidance document as these will need to be tailored to the policy in question. However, the following criteria provide examples of the type of indicator which may be appropriate for monitoring policies concerning chalk streams:

- Percentage of chalk streams achieving 'good' status as set out in River Basin Management Plans
- Planning applications granted contrary to advice from the Chilterns National Landscape

Plan making checklist:

- **Name the chalk streams present within the area in the Plan**
- **Identify chalk streams on the policies map or map showing sites of ecological value**
- **Make specific reference to chalk streams within policies relating to the Chilterns National Landscape**
- **Make specific reference to the unique nature of chalk streams in policies relating to water quality and quantity**
- **Include protection and enhancement of chalk streams in criteria based policies relating to the natural environment**
- **Include specific protection or enhancement measures for chalk streams in site allocations policies**
- **Ensure specific reference to the protection of habitats and species related to chalk streams**

05 Development Management

Development Management

All development requiring planning permission is determined in accordance with the Development Plan (Local Plan) for the area, taking into account relevant material considerations. There are additional restrictions placed on development within National Landscapes (as outlined in the NPPF). The Management Plan for the Chilterns National Landscape is a material consideration in planning decisions within the National Landscape. It provides evidence on the characteristics of the Chilterns and objectives for development in the Chilterns. This Chalk Streams Planning Guidance is also a material consideration and should be afforded appropriate weight where a scheme may impact a chalk stream.

It is important to recognise that **all** development may have an impact on chalk streams. This will depend on the nature of the development, and its location. It is easy to understand how a development site which contains a chalk stream may impact on the stream. It is less obvious how a scheme outside of the National Landscape or with no stream present on site, may impact the same chalk stream. However, indirect impacts from such developments some distance from the chalk stream are still impacts and measures should be put in place to ensure protection and enhancement of the stream.

Early consideration of the potential impacts of development on chalk streams helps to ensure that they are appropriately considered during scheme design, minimising unintended consequences and ensuring that opportunities to enhance the water environment are maximised.

The pre-application and scheme design stage is the best time to consider these matters. There is more scope for significant alterations to design than following submission of an application. This is particularly important for major developments or those altering or draining to a watercourse.

Pre-application and scheme design

Early engagement with the relevant Local Planning Authority and the Environment Agency, in the form of pre-application discussion is recommended for all but the most minor applications in the National Landscape. This is particularly important where an application site includes or is within close proximity to a chalk stream. At this early-stage applicants should consider how their scheme may impact on chalk streams and respond to this in their design deliberations. The National Landscape and local catchment partnership groups can provide invaluable contributions, including local knowledge and updated state-of-the-river reports, and should also be contacted at early stages of development. The suggested enhancements and positive actions listed below should be incorporated where possible. Applicants need to explain the choices they have made, and how their development will address chalk streams within the Design and Access Statement. The level of detail provided must be relative to the likely direct or indirect impacts which may arise because of the scheme.

For sites with a chalk stream within the site, the Design and Access Statement should show how the design will avoid development close to the chalk stream and how it will enhance the ecological health of the river. Potential pathways for pollution should be identified and mitigated ensuring that there will be no runoff that negatively affects the chalk stream present. This will be particularly important in relation to run-off and drainage from housing and employment sites, specifically where there may be sensitive catchments, and cumulative effects, but also applies to agricultural development. The Design and Access Statement should also clearly set out how the development will incorporate the suggested positive action set out in the Enhancements and positive actions section below.

Enhancements and positive actions

Where a chalk stream is present within a site there are a number of specific actions that can be implemented as part of new developments to protect the stream as well as contributing to its enhancement.

Deculverting

Deculverting is the practice of opening up all or part of a buried water course. This can include:

- Completely removing the culvert and reprofiling the bank to renaturalise the watercourse
- Removing sections of culvert
- Only removing the top covering of a culvert
- Creating gaps or installing skylights in the tops of the culvert to allow daylight through

Complete removal of a culvert will always be the preferred option, as this will deliver the greatest benefit. However, even where a chalk stream cannot be fully deculverted along its length, steps can be taken to deculvert small sections of the river within a development site. Any opportunities to deculvert should be considered both in isolation and cumulatively.

Misbourne culvert under Chalfont St Peter

Wye town centre culvert

Riverside Hemel, deculverted River Gade

Buffer Zones

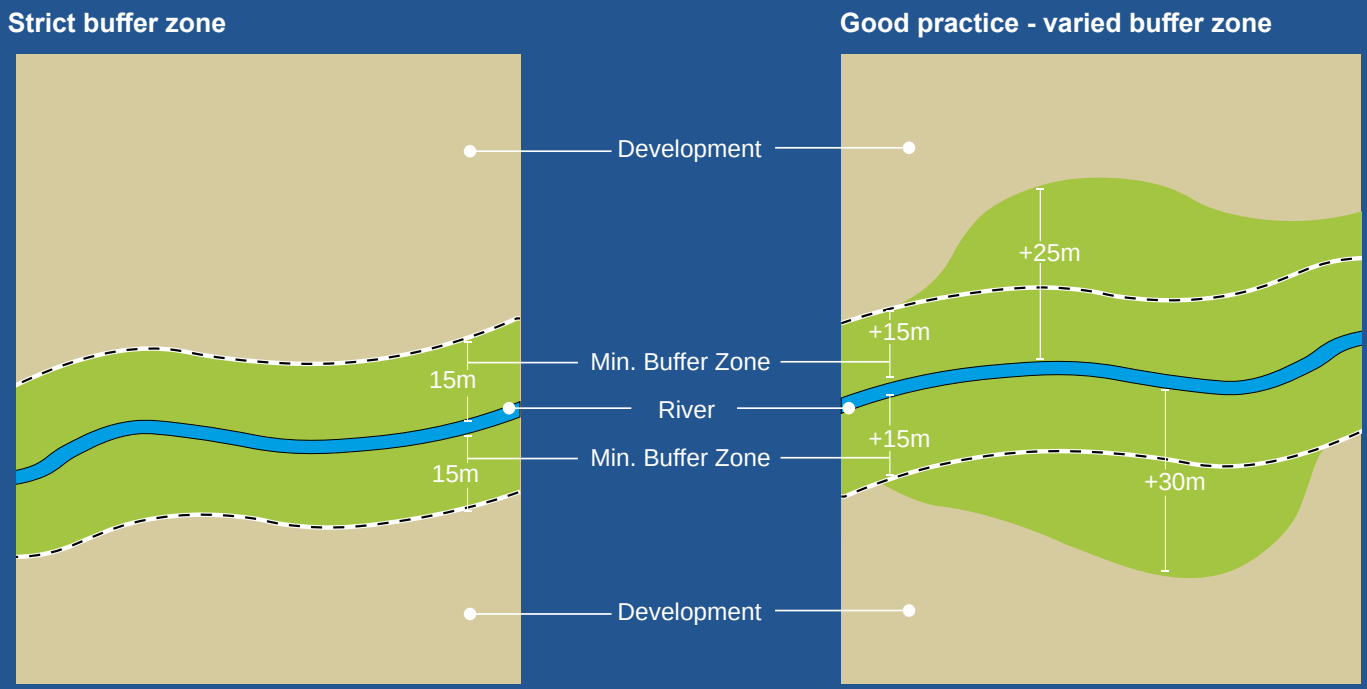
Retaining, or reinstating an adequate 'buffer zone' between a chalk stream and built development is very important. These areas are vital to both the water environment and the conservation of riverside wildlife. On previously developed land, where buffer zones have been removed entirely, or are inadequate, buffer zones should be reinstated or widened. A buffer zone is important to allow for future restoration work, ensure habitats are retained, and preserve water quality through better run off management. Restored river and buffer zones are an asset to any development.

In all circumstances the Water Resources Act and Land Drainage Byelaws dictate that an 8-metre buffer zone is maintained. The Environment Agency will oppose development within 8 metres of a Main watercourse which compromises their ability to carry out their statutory duties of flood defence. The Environment Agency recommend that for ecological and conservation purposes, development should be a minimum distance of 10 metres (measured from the top of the riverbank to the development) for all new development. The Catchment Based Approach (CaBA) also recommend a "no development" buffer zone around chalk streams, specific distances are provided for agricultural land but no specific metreage is suggested for built development.

Within the National Landscape it is considered that a 15m "no development" buffer zone should be viewed as the minimum distance which is acceptable for chalk streams, and wider buffers should be encouraged. In areas outside but affecting the National Landscape the buffer zone should be of a sufficient size in relation to the development proposed, and buildings should not be closer to the river than their height, irrespective of the buffer. Buildings should be set back from the top of the bank of the watercourse by at least 15m, or by the height of the building, whichever is greater.

The buffer zone should also be varied along the length of the watercourse, i.e. not strictly built up to along its length, meaning some areas have a greater buffer than the minimum required. The buffer zones should be maintained as a natural or semi-natural habitat free from built development, parking areas, private gardens and formal landscaping and should be provided on both sides of any watercourse that runs through a development.

The buffer zone should be designed and planted with locally sourced native plants that are typically found in and around chalk streams. The buffer zone may include wetlands, herb-rich riverside grasslands and appropriate native tree planting (such as alder, willow, hawthorn or blackthorn). Appropriate management plans should be prepared for the buffer zone landscape and secured in perpetuity.



Example of strict application of buffer zone and better varied application of buffer zone

Buffer Zones

Examples of good buffer zone with development set back and bank improvements incorporated.

Examples of poor buffer zone, development is right up to the river credit A.Porter

Public access

As the majority of rivers are privately owned there is often a lack of public access. Development can provide good opportunities to increase public access to rivers and riverbanks. Increasing public access provides a great opportunity to engage the general public with the health of their chalk stream in particular, and with chalk streams and rivers more widely. Notwithstanding the numerous health and wellbeing benefits of increased public access to green and blue infrastructure. Chalk streams can provide the focal point for access corridors into and through urban areas as well as valuable blue & green spaces in their own right.

It is anticipated that public access to a chalk stream will be provided in all developments unless there are particular concerns that this would result in negative impacts on the ecological health of the river. In cases where full public access is not appropriate, forms of restricted public access should be explored.

Boardwalk - Meades Water Gardens, Chesham

Access will require careful zoning (and interpretation) to ensure the right balance of access for people and undisturbed areas for wildlife. Paths should be set back from the river, with shorter sections where the path comes closer to the river to afford a closer view.

Removal/management of invasive species

Development provides an opportunity for the removal and/or management of any non-native invasive species present on site such as Himalayan balsam and Japanese knotweed as required by Schedule 9 of the Wildlife & Countryside Act.

Japanese knotweed

Site design to consider shading/water temperature

Site design should consider the nature of the river and whether increased tree planting would be appropriate. Providing sections of the stream that are shaded will help manage the temperature of the water and allow different plants and wildlife to thrive. This is particularly important for fish and to prevent an overrun of aquatic weeds. This will become increasingly important in assisting with adaptation to climate change.

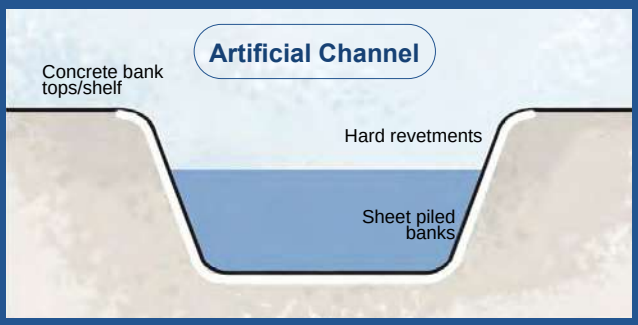
Where planting is introduced to create shading, this should be done in a patchwork manner so that areas remain more open and capable of allowing aquatic and marginal plants to establish. Dappled shade achieved by planting is very different to the more solid shading that can occur if buildings are located too close to watercourses.

Bank improvements

Improvements can be made to protect riverbanks to improve stability or to contain flood flows and direct water away from urban areas. However, improvements can also be made to renaturalise riverbanks Natural bank management is the preferred method of intervention. Techniques such as construction of gradual banks, marginal shelves, beaches and shallows, and the planting of native marginal vegetation in two stage channels will assist in providing stability and reducing flood flows. There are additional benefits of such interventions in that they will also provide appropriate habitats and improve aesthetic and recreational value.

Bank improvements can create direct benefits for the physical condition of the watercourse and species which live on the banks of the river. More widely, improvements can reinstate or support natural processes, such as erosion and deposition. Although there is an initial cost associated with the works, there can be a reduction in maintenance costs in the long term, when compared to more man-made flood defence solutions.

Any works to the bed, banks or within 8m of the top of the riverbank on a Main river will require a Flood Risk Activity Permit from the Environment Agency (or a Land Drainage Consent from the Lead Local Flood Authority on Ordinary watercourses.)



Example of before De-canalising, Chesham Moor

Example of after De-canalising, Chesham Moor

Sustainable drainage and run off management

Within chalk stream catchments, a particular focus should be paid to water quality management when considering sustainable drainage solutions. On sites with a chalk stream present surface water run-off should be exceptionally carefully managed.

Sustainable drainage is encouraged but this should not be at the expense of the containment of potential pollution. The drainage hierarchy set out in the Planning Practice Guidance should be enforced for all development:

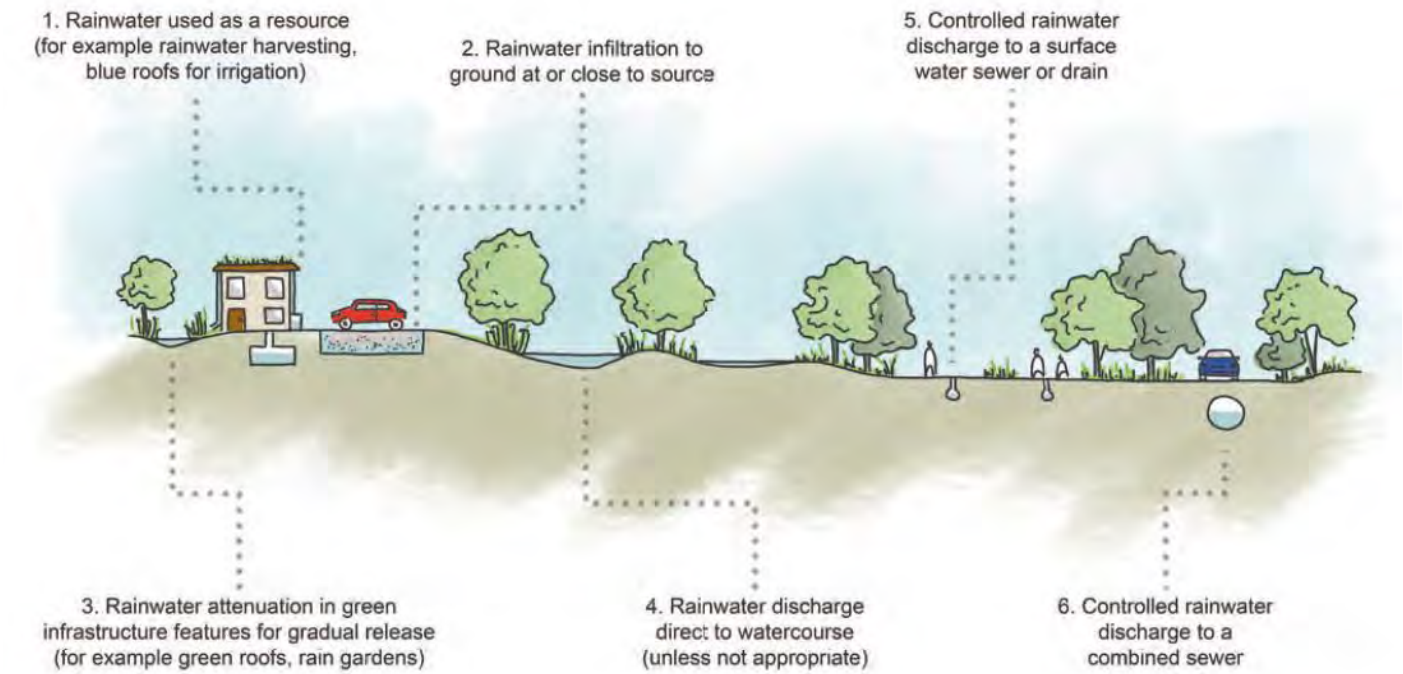
1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer .

Wherever possible new developments should employ rainwater re-use (e.g. rainwater harvesting and stormwater harvesting), which helps reduce potable water demand and the discharge of water. Following this, schemes should look to infiltration to manage surface water. The use of infiltration/soakaway systems can help to recharge the underlying chalk aquifers but this approach must consider water quality and ensure pollutants are contained and treated. Developments should consider the use of permeable surfaces for paving and parking areas, with appropriate control of potential pollutants. The CIRIA SUDS Manual provides detail on managing water quality in differing types of sustainable drainage solution. SUDS schemes should have clear management plans and identified sources of funding to ensure ongoing maintenance.

The Lead Local Flood Authority will provide advice on appropriate drainage and will be consulted by the Local Planning Authority on all major developments. It may also be appropriate to liaise with the relevant sewerage undertaker, the Environment Agency, the highways authority, the canal and river trust and the internal drainage board.

If there is any discharge to rivers, discharge consent may be required from the EA and a Flood Risk Activity Permit may also be required from the Lead Local Flood Authority. The relevant water company should be consulted on sustainable drainage schemes. It is the responsibility of a developer to make proper provision for surface water drainage to ground, water courses or surface water sewer. Surface water must not drain to the foul sewer, as this is the major contributor to sewer flooding.

Rain garden planting at Leicester Mill Lane



The drainage hierarchy diagram

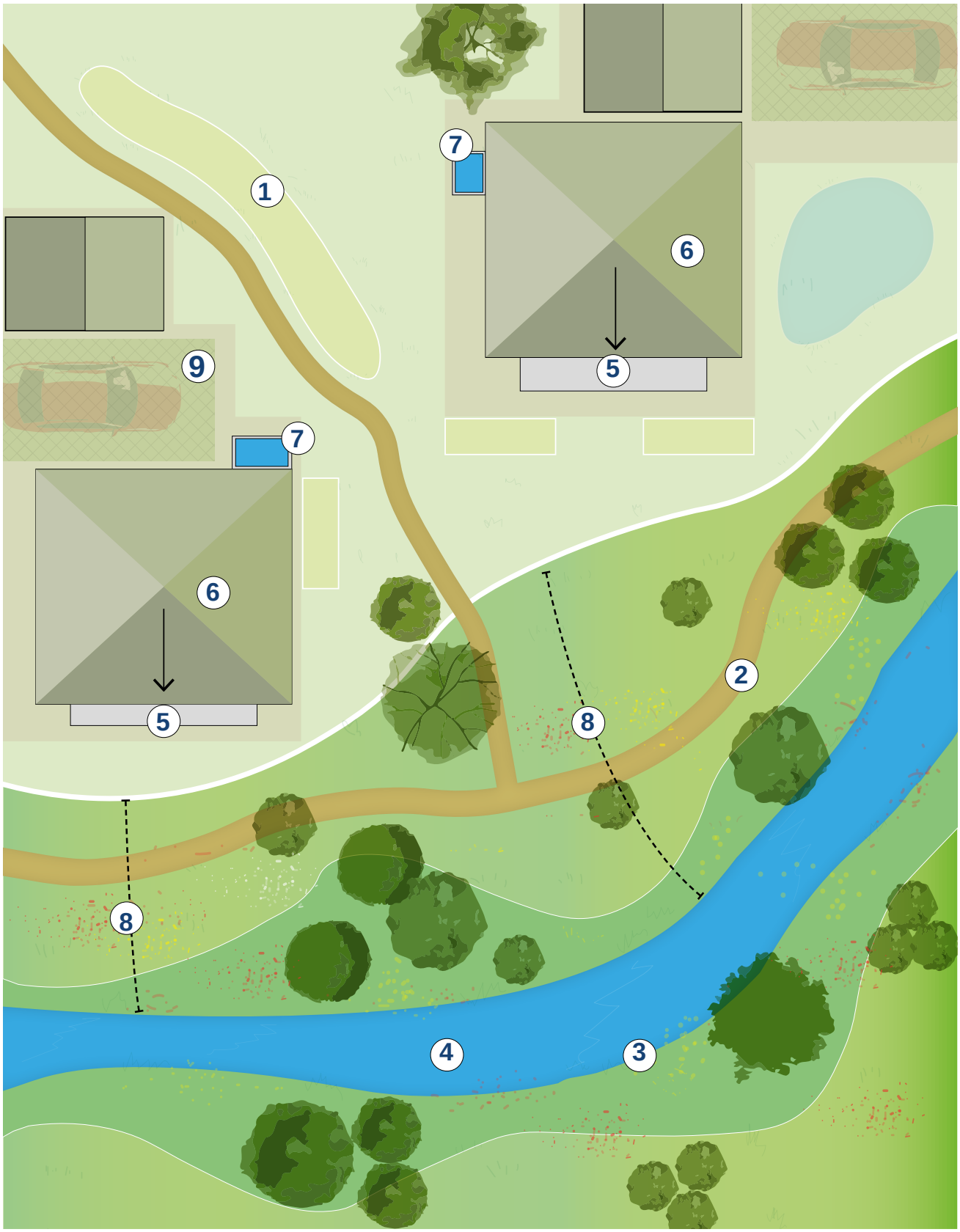
Water consumption

Development must be designed to be water efficient and reduce water consumption. Developers should adopt the highest water-efficiency standards possible. Greywater and sustainable drainage systems should be utilised to reduce water demand, and education efforts should be encouraged. Applicants should consider early discussions with the relevant local water company.

In chalk stream areas, development is expected to achieve mains water consumption of 90 litres per day (as per the CaBA chalk streams strategy recommendations). At a minimum, development should achieve 105 litres per day (plus 5 litres for external water consumption), in line with the 'Fittings Approach' in Table 2.2 of Part G of Building Regulations. A condition requiring the use of these standards should be applied to all development that is permitted in the Chilterns.

Example of dry river bed - River Chess, Chesham

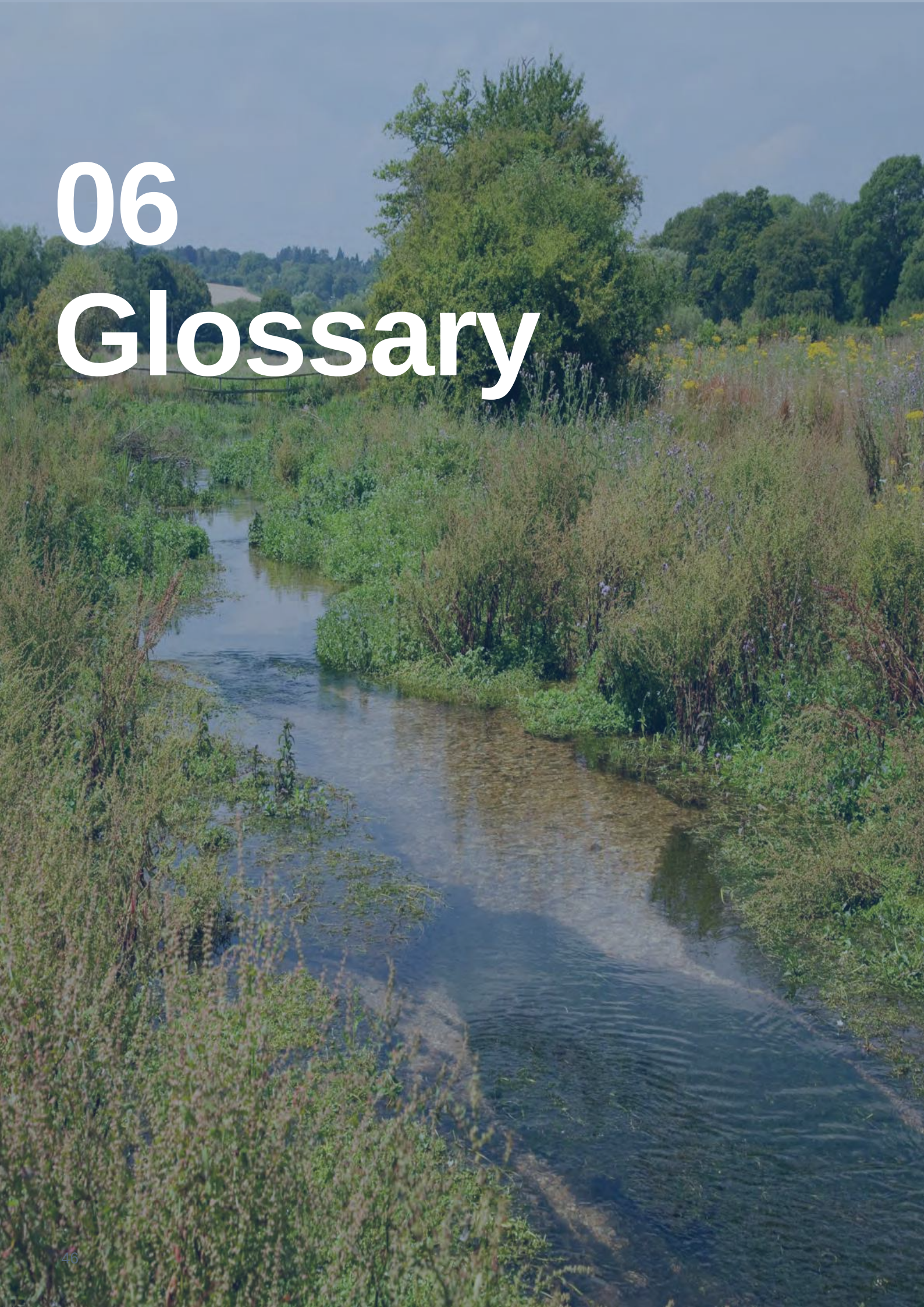
Example development scheme



1. SuDS measures incorporated throughout the development e.g. balancing pond designed to provide wildlife benefits
2. Good public access with all paths set back to the rear of the buffer zone
3. Natural bank management
4. River open and natural. All barriers / culverts removed and natural banks reinstated
5. Development facing the river
6. Green roofs to buildings
7. Water butts and rainwater harvesting to reduce water demand
8. Wide and varied buffer zone (15m) with locally native planting of UK genetic provenance
9. Road run-off kept away from river.

Planning Application checklist:

- Early engagement with Local Planning Authority, Environment Agency, Lead Local Flood Authority and the National Landscape team
- Application of as many positive actions as possible on site
- Consider chalk streams as part of Biodiversity Net Gain, ensuring chalk streams are properly accounted for within the metric for BNG, and in relation to climate change and resilience
- Design and Access Statement which explains the design choices and their impacts on chalk streams
- Ensure all planting is locally appropriate and climate resilient
- Allow for the controlled removal of invasive species

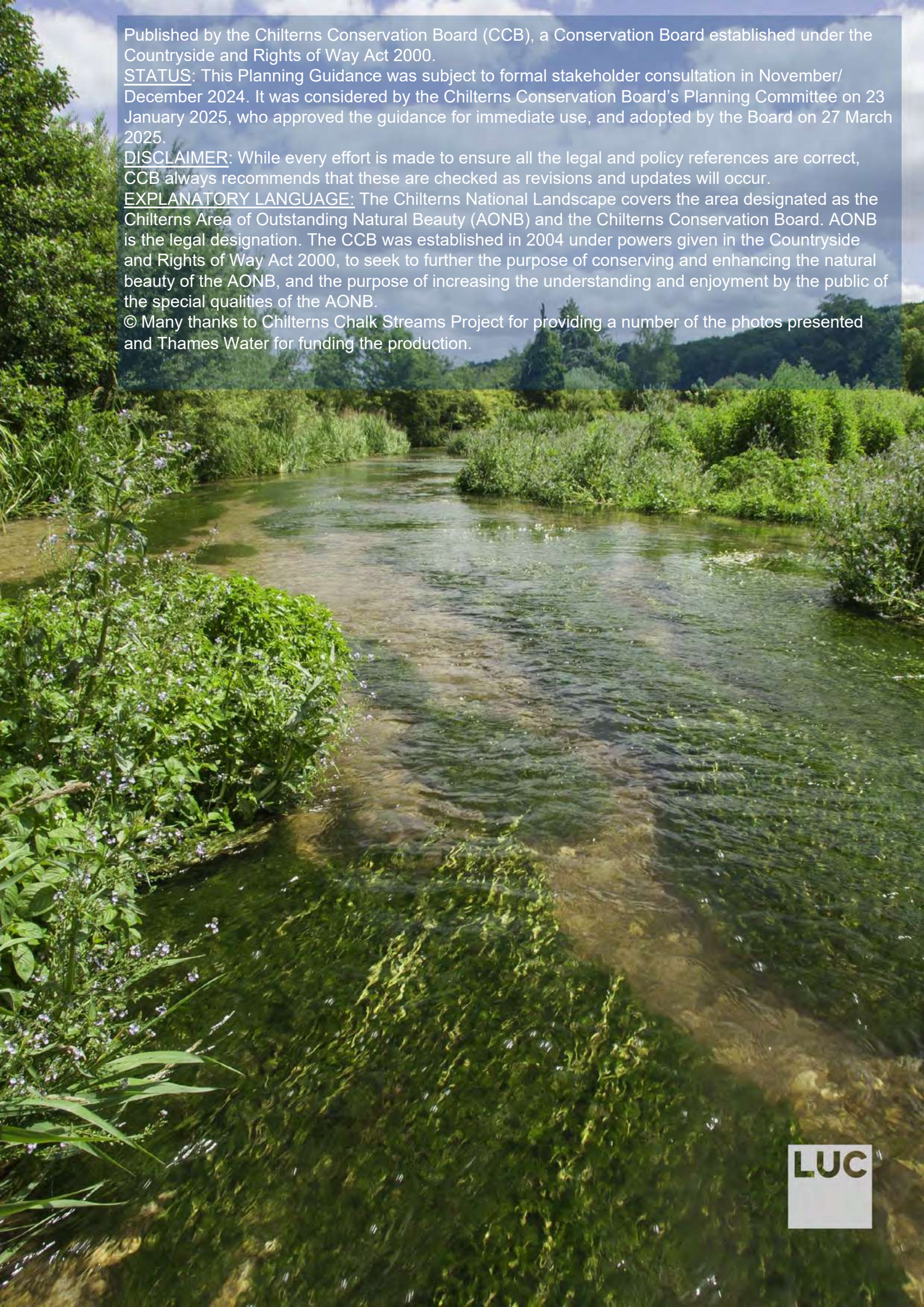


06 Glossary

Term	Explanation
Abstraction	The process of extracting water from any natural source, such as a lake, aquifer, river, stream or spring.
Area of Outstanding Natural Beauty (AONBs)	An Area of Outstanding Natural Beauty is land protected by the Countryside and Rights of Way Act 2000 (CROW Act). It protects the land to conserve and enhance its natural beauty. AONBs are now referred to as National Landscapes.
Biodiversity Net Gain (BNG)	The requirement for all development to provide a measurably positive impact ('net gain') on biodiversity, compared to what was there before development. In England, BNG is mandatory under Schedule 7A of the Town and Country Planning Act 1990 (as inserted by Schedule 14 of the Environment Act 2021). Developers must deliver a BNG of 10%.
Building Research Establishment Environmental Assessment Method or Housing Quality Mark (BREEAM or HQM)	BREEAM/HQM is a sustainability assessment method used to assess the environmental performance of buildings. It assesses a range of categories including energy, water, health, pollution transport, materials, and waste.
Catchment Based Approach (CaBA)	The CaBA is a civil society led initiative that works in partnership with Government, Local Authorities, Water Companies, businesses and more. It aims to embed collaborative working at a river catchment scale, delivering a range of environmental, social and economic benefits and protecting precious water environments.
Chalk Streams	Rivers that rise from springs in landscapes with chalk bedrock. Chalk streams contains little organic matter and sediment and can be extremely clear. The beds of the rivers are generally composed of clean, compacted gravel and flints, which are good spawning areas for certain fish species. As they are fed primarily by aquifers, the flow rate, mineral content and temperature range of chalk streams exhibit less seasonal variation than other rivers. They support a diverse range of plant and animal species.
Chilterns National Landscape	The designated area and the preferred name of the organisation managing the landscape
Chilterns Conservation Board (CCB)	The CCB is the public body established to conserve and enhance the Chilterns National Landscape.
Design & Access Statement	A design and access statement is a short report accompanying and supporting a planning application. It provides a framework for applicants to explain how a proposed development is a suitable response to the site and its context.
Environment Agency (EA)	The EA is a non-departmental public body sponsored by the Department for Environment, Food and Rural Affairs, with responsibilities relating to the protection and enhancement of the environment in England. It is responsible for flood management, waste management, regulating land and water pollution, and conservation
Glover Review	An independent review into whether the protections for national parks and areas of outstanding natural beauty (AONBs) are still fit for purpose.
Groundwater	All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

Term	Explanation
Lead Local Flood Authority (LLFA)	Lead Local Flood Authorities are county councils or unitary authorities. They lead in managing local flood risks (i.e. risks of flooding from surface water, ground water and ordinary (smaller) watercourses). This includes ensuring co-operation between the Risk Management Authorities in their area.
Local Plan	A local plan is a document prepared by a Local Planning Authority in consultation with the community. It sets out a vision and framework for the future development of an areas, guiding decisions on future development proposals. It covers topic such as housing ,employment, infrastructure and the environment.
Local Planning Authority	A Local Planning Authority is a Council that is empowered by law to exercise planning functions for a particular area.
Local Nature Recovery Strategy (LNRS)	Local Nature Recovery Strategies are a new, England-wide system of spatial strategies that will establish priorities and map proposals for specific actions to drive nature's recovery and provide wider environmental benefits.
National Landscape	A National Landscape is a formal designation for an area of land that is of national importance for its natural beauty. National Landscapes have the same level of landscape quality and the same level of protection as National Parks. The purpose of National Landscape designation is 'to conserve and enhance the natural beauty of the area'.
National Planning Policy Framework (NPPF)	The NPPF sets out the Government's planning policies for England and how these should be applied. It provides a framework within which local plans can provide for sufficient housing and other development in a sustainable manner.
Neighbourhood Plan	A neighbourhood plan is a community-led framework for guiding the future development, regeneration, and conservation of an area. Once adopted, they become part of the development plan and the policies contained within them are then used in the determination of planning applications.
Planning Practice Guidance (PPG)	The Planning Practice Guidance offers detailed policy guidance on various aspects of the planning system, complementing the National Planning Policy Framework.
Priority habitat	Priority Habitats are listed in an inventory of habitats of principal importance for biodiversity conservation. The habitat types have been identified as being the most threatened and requiring conservation action. Priority habitats are sometimes known as S41 Habitats (as publishing the list is a legal duty under Section 41 of the Natural Environment and Rural Communities (NERC) Act.
Protected Landscape	Protected Landscapes is a collective term to cover National Parks, the Norfolk and Suffolk Broads and National Landscapes in England.
Riparian owner	A landowner whose land contains a watercourse.
River Basin Management Plan (RBMP)	River basin management plans set the legally binding locally specific environmental objectives that underpin water regulation (such as permitting) and planning activities.
Species of principle importance	Species of principal importance are those identified as being of significant conservation concern. In England, these species are listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The list includes species that were originally identified in the UK Biodiversity Action Plan (UK BAP) and are considered crucial for biodiversity conservation.

Term	Explanation
Sustainable Urban Drainage Systems (SUDS)	SUDS is a term for a set of techniques designed to manage and control surface water runoff. The aim of SUDS is to manage run off locally, mimicking natural drainage by encouraging infiltration, attenuation and passive treatment.
Urban diffuse pollution	Urban diffuse pollution is the release of potential pollutants from a range of activities that, individually, may have no effect on the water environment, but, at the scale of a catchment, can have a significant effect.
Water Framework Directive (WFD)	The Water Framework Directive has been the main law for water protection in Europe since 2000, it has been transposed into UK law post Brexit. The aim of the WFD is to protect water environments by preventing their deterioration and improving their quality. It does this by setting ecological targets and environmental objectives.
Water Resource Management Plan (WRMP)	A Water Resource Management Plan sets out how a water company will provide a secure and sustainable supply of water to their customers, whilst protecting the environment. They are required to produce one every five years.
Winterbourne	Winterbournes are found in the upper reaches of chalk rivers. They are stretches of the river that have periods of the year where the ground is dry (through the summer and into early autumn as ground water levels fall). The fluctuating wet/dry nature of winterbournes supports specifically adapted species who thrive in this shifting environment.



Published by the Chilterns Conservation Board (CCB), a Conservation Board established under the Countryside and Rights of Way Act 2000.

STATUS: This Planning Guidance was subject to formal stakeholder consultation in November/ December 2024. It was considered by the Chilterns Conservation Board's Planning Committee on 23 January 2025, who approved the guidance for immediate use, and adopted by the Board on 27 March 2025.

DISCLAIMER: While every effort is made to ensure all the legal and policy references are correct, CCB always recommends that these are checked as revisions and updates will occur.

EXPLANATORY LANGUAGE: The Chilterns National Landscape covers the area designated as the Chilterns Area of Outstanding Natural Beauty (AONB) and the Chilterns Conservation Board. AONB is the legal designation. The CCB was established in 2004 under powers given in the Countryside and Rights of Way Act 2000, to seek to further the purpose of conserving and enhancing the natural beauty of the AONB, and the purpose of increasing the understanding and enjoyment by the public of the special qualities of the AONB.

© Many thanks to Chilterns Chalk Streams Project for providing a number of the photos presented and Thames Water for funding the production.

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