

# Aston Rowant Neighbourhood Development Plan

## **Aston Rowant and Kingston Blount Landscape Sensitivity and Capacity Assessment**

February 2019



**LEPUS** CONSULTING  
LANDSCAPE, ECOLOGY, PLANNING & URBAN SUSTAINABILITY

# Aston Rowant and Kingston Blount Landscape Sensitivity and Capacity Assessment

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Photo: Aston Rowant by Rebecca Gregory

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## Acronyms

<b>AONB</b>	Area of Outstanding Natural Beauty
<b>AOD</b>	Above Ordnance Datum
<b>SAC</b>	Special Area of Conservation
<b>SSSI</b>	Site of Special Scientific Interest

# 1 Introduction

## 1.1 Appointment and scope of work

1.1.1 Lepus Consulting Ltd has been appointed by Aston Rowant Neighbourhood Development Plan (NDP) Steering Group to carry out a Landscape Capacity and Sensitivity Study within an identified area of the parish of Aston Rowant. Within this report this area is referred to as the study area.

1.1.2 Landscape sensitivity and capacity studies should consider the capacity of the landscape to accommodate a specified change or set of development proposals. Aston Rowant and Kingston Blount are classified as 'smaller villages' in the emerging South Oxfordshire Local Plan. At the time of preparing this study, smaller villages are not required to allocated sites for residential development. The policy context at the time of preparing this report is set out in **Chapter 3**, below, particularly of note is emerging policy H8 'Housing in the Smaller Villages'. This study will consider the sensitivity of the landscape to small scale residential development.

1.1.3 Lepus Consulting is an environmental assessment practice specialising in landscape and ecological impact assessment. This report has been prepared by Rebecca Gregory (BSc, DipLA, CMLI) and Neil Davidson (BSc, MSc, CEnv, CIEEM, CMLI).

1.1.4 This study was conducted between November 2018 and February 2019.

## 1.2 Geographic context of Aston Rowant Parish

1.2.1 The parish of Aston Rowant is located in Oxfordshire approximately 25 km south east of the city of Oxford. The parish lies between Watlington and Chinnor. The B4009, Chinnor Road, connects the villages of Aston Rowant and Kingston Blount. The smaller hamlets of Kingston Stert, Chalford and Copcourt lie to the north west of the parish, to the south lie the Chiltern Hills, designated as an Area of Outstanding Natural Beauty (AONB). The population of the parish is reported as 810 (Community Insight profile report of 2016).

- 1.2.2 Aston Rowant parish is a largely rural community where agriculture is prevalent, with arable farming and grazing on the land north and west of the Chilterns and horse-breeding in the several stud farms around Aston Rowant.

### 1.3 Planning policy context

- 1.3.1 Neighbourhood Planning is a tool whereby local communities have the opportunity to shape the way their local area grows and develops. Neighbourhood Plans sit within the context of the wider English planning policy hierarchy. This study has been undertaken within the context of relevant planning policy. **Chapter 3** of this study sets out the planning policy and legislative framework. Relevant planning policy is taken from:

- The National Planning Policy Framework 2018; and
- The Emerging South Oxfordshire District Council (SODC) Local Plan 2011-2033.

### 1.4 Landscape character assessment hierarchy

- 1.4.1 Preparation of landscape character assessment at different scales is an important consideration when preparing development plans or making planning decisions. The landscape character assessment exercise, and how it is approached, is dependent upon the scale and level of detail required as this will influence the level in the national-local hierarchy at which it is being carried out.
- 1.4.2 The vertical hierarchy of landscape character assessments includes the English National Character Areas (published by Natural England), county level assessments, district level assessments and local landscape character assessments.
- 1.4.3 Neighbourhood plans sit at a level 'underneath' the district. Landscape capacity assessments are set within the context of published Landscape Character Assessment. It is important that the process of Landscape Character Assessment helps to ensure consistency of description across boundaries. The level of detail and cartographic granularity increases inversely in proportion to the size of the area being assessed. Smaller study areas will have higher levels of granularity.

1.4.4 The published landscape character assessments relevant to this study comprise:

- National Character Area 110: The Chilterns (2013);
- National Character Area 108: Upper Thames Clay Vales (2014);
- The county level Landscape Character Assessment: The Oxfordshire Wildlife and Landscape Study (OWLS) (2004); and
- The district level Landscape Character Assessment: Landscape Character Assessment for the Local Plan 2033: South Oxfordshire District Council (2017).

1.4.5 **Chapter 4** of this report provides further details from these assessments of relevance to this study.

## 1.5 25 Year Environment Plan

1.5.1 The document: 'A Green Future: Our 25 Year Plan to Improve the Environment' was published in January 2018 by the Department for Environment, Food & Rural Affairs (DEFRA)<sup>1</sup>. A plans objectives are states as:

1.5.2 *"This 25 Year Environment Plan sets out government action to help the natural world regain and retain good health. It aims to deliver cleaner air and water in our cities and rural landscapes, protect threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first."*

1.5.3 The plan identifies six key areas around which action will be focused, this includes the policy; 'recovering nature, and enhancing the beauty of landscapes'. An action identified within this policy relevant to this study is as follows:

1.5.4 *"Identifying opportunities for environmental enhancement in all of England's 159 National Character Areas and monitoring indicators of our landscape's character and quality to improve landscapes for people, places and nature."*

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<sup>1</sup> Department for Environment, Food and Rural Affairs (2018) 25 Year Environment Plan. Available at: <https://www.gov.uk/government/publications/25-year-environment-plan> [Date Accessed: 15/06/18]

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- 1.5.5            The 25 Year Plan recognises that; *“Our landscapes – our hills, valleys and plains – were created by age-old geological processes but the way our rural and urban environment looks now owes as much to the work of people as nature. Down the centuries, we have shaped and adapted our rural and urban landscape to suit our purpose, not always aware of the lasting effects of our actions – for good or ill – on the appearance and health of the environment”.*
- 1.5.6            Landscape Character Assessment is a process which seeks to classify landscapes into areas with distinct and recognisable landscape characteristics that help to identify what makes landscapes distinctive and different to one another. The process follows a methodology which has been developed over many years following guidance set out by Natural England and the Landscape Institute.
- 1.5.7            **Chapter 2** of this study sets out the methodology that will be adopted in relation to the assessment of landscape character and the visual context of the study area and its sensitivity to and capacity to accommodate change.



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## 2 Landscape capacity methodology

### 2.1 Landscape capacity studies - context

2.1.1 Best practice guidance does not provide a universal, fixed method for conducting all landscape capacity studies. Instead, the guidance presents a structure under which landscape capacity studies are based, and this will change depending on a number of factors including the location and scale of the study. The methodology for this study is based on guidance taken from the following key texts:

- Natural England's An Approach to Landscape Character Assessment (2014) and subsequent Topic Paper 6 Techniques and Criteria for Judging Capacity and Sensitivity (2006);
- The Landscape Institute / IEMA Guidelines for Landscape and Visual Impact Assessment 3rd edition (2013) (GLVIA); and
- Scottish Natural Heritage (2017) A Guide to Commissioning a Landscape Capacity Study.

2.1.2 Landscape capacity is defined as:

*"the degree to which a particular landscape character type or area is able to accommodate change without significant effects on its character, or overall change of landscape character type. Capacity is likely to vary according to the type and nature of change being proposed".<sup>2</sup>*

2.1.3 Landscape capacity is assessed within 'parcels' of land. For this study, parcels are defined by field boundaries. Stands of woodland are also considered as parcels. Domestic properties and their gardens have not been assessed as field study parcels in this appraisal.

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<sup>2</sup> Scottish Natural Heritage (2017) A Guide to Commissioning a Landscape Capacity Study.

- 2.1.4 The assessment of landscape capacity begins with a desktop assessment to gauge the scope and scale of the study area. This exercise was then followed by the field study. During this phase, the assessment of parcels were 'ground-truthed' to determine aesthetic and perceptual factors including, but not limited to, views to and from the Chiltern Hills AONB. The field study is undertaken from public rights of way, highways and publicly accessible open spaces.

## 2.2 Housing density

- 2.2.1 The assessment of parcels is based on the extent to which the land in question would change when compared to existing, or baseline, conditions. Landscape sensitivity was determined from baseline information and landscape value for existing designated landscape or landscape-related receptors. When determining capacity, housing density and design was loosely based on nearby housing in relation to the parcel being assessed.

## 2.3 Methodology

- 2.3.1 The methodology for the assessment of landscape capacity has seven stages:

- Determine landscape character sensitivity;
- Determine visual sensitivity;
- Calculate landscape sensitivity;
- Determine wider landscape sensitivity;
- Calculate overall landscape sensitivity;
- Determine landscape value;
- Calculate landscape capacity.

## 2.4 Stage 1: Landscape character sensitivity

- 2.4.1 The assessment of landscape character sensitivity considers natural, cultural and perceptual factors (see **Table 2.1**). The landscape character sensitivity matrix is shown in **Table 2.2**.

- 2.4.2 Parcels are reviewed to assess their relative landscape character sensitivity. Natural factors, cultural factors and perceptual factors are scored from low (1) to high (5), these scores are then added up (see **Table 2.2**).

2.4.3 To achieve transparency and clarity, sensitivity assessments should aim to:

- Identify criteria which are clearly relevant to the specified development and the landscape which is being assessed;
- Provide a clearly presented assessment of the sensitivity of each individual criterion in each landscape area;
- Make sure that all relevant information is presented in an accessible form – there should be no ‘leaps of faith’, you should be able to understand exactly how the consultants have come up with the sensitivity rating;
- Avoid complexities, such as adding together scores through a series of stages to provide difficult to unravel aggregate scores;
- Avoid ‘weighting’ criteria without a clear rationale – i.e. making some of the criteria more important than the others – unless the reason for doing this is easy to understand and robust;
- Minimise ‘double counting’ or ‘cancelling out’ i.e. when one criterion is very similar to another, or when one attribute of the landscape is scored highly sensitive in relation to one criterion, but then is allocated a lower rating in another criterion;
- Make sure that there is a clear rationale linking analysis, assessment and recommendations or conclusions; and
- Keep it as simple as possible – it needs to be used by people who are not on the steering group. It is important to scrutinise the method to make sure that it is transparent and that it is easy to understand how the overall, final assessment of sensitivity has come about<sup>3</sup>.

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<sup>3</sup> Scottish Natural Heritage (2017) A Guide to Commissioning a Landscape Capacity Study.

*Table 2.1 Landscape character sensitivity (this is not exhaustive)*

Factor	Higher sensitivity	Lower sensitivity
Natural	Native woodland	Plantation
	Significant tree/groups	Insignificant/young trees
	Strong hedgerow structure with hedgerow trees	Weak structure and no trees
	Species rich grassland	Arable field
	Significant water feature(s)	No water feature(s)
	Varied landform and distinctive feature of the area	Uniform landform and lack of topographical features
	Pronounced geology	Lack of geological features
	Soils significantly contribute to landscape features	Soils are not an important feature
	Complex and vulnerable land cover	Simple robust land cover
	Presence of other significant vegetation cover	Absence of other significant vegetation
	Presence of valued wildlife habitats	Absence of valued wildlife habitats
	Significant wetland habitats and meadows	Poor water logged areas
	Presence of common land	No common land
Cultural	Distinctive good quality boundary features	Generic or poor boundary features
	Evidence of surviving part of a historic landscape	No evidence
	Complex historic landscape pattern with good time depth	Simple modern landscape
	Important to setting or in a conservation area	No relationship
	Includes a scheduled ancient monument important to setting	No relationship
	Locally distinctive built form and pattern	Generic built form
	Important to setting of a listed building	No relationship
	Distinctive strong settlement pattern	Generic or eroded pattern
	Locally significant private gardens	Poorly maintained gardens erode the character
	Evidence of visible social cultural associations	Lack of social cultural associations
Perceptual	Quiet area	Noisy area
	Absence of intrusive elements	Intrusive elements present
	Dark skies	High levels of light pollution
	Open exposed landscape	Enclosed visually contained landscape
	Unified landscape with strong landscape pattern	Fragmented/'bitty' or featureless landscape
	Well used area of land appreciated by the public	Inaccessible by public
	Important rights of way	None present
	Well used and valued open air recreational facilities	None present
	Open access land	None present

*Table 2.2 Landscape character sensitivity*

Natural factors	L (1)	L/M (2)	M (3)	M/H (4)	H (5)
Cultural factors	L (1)	L/M (2)	M (3)	M/H (4)	H (5)
Perceptual features	L (1)	L/M (2)	M (3)	M/H (4)	H (5)
Overall landscape sensitivity	3-4 = Low; 5-7 = Med/Low; 8-10 = Med; 11-13 = Med/High; 14-15 = High				

## 2.5 Stage 2: Visual sensitivity

2.5.1 The assessment of visual sensitivity considers the types of views, the visual receptors and the potential to mitigate (see **Table 2.3**). The visual sensitivity matrix is shown in **Table 2.4**.

2.5.2 Parcels are reviewed to assess their relative visual sensitivity. Types of views, visual receptors and potential to mitigate are scored from low (1) to high (5), these scores are then added up (see **Table 2.4**).

*Table 2.3 Visual sensitivity features*

Factor	Higher sensitivity	Lower sensitivity
Types of views	Sequenced and exposed views	Fleeting and limited views
	Most of site area visible	Little of site area visible
	Site is a key focus in available wider views	Site is an incidental part of wider views
	Site includes prominent and key landmarks	No landmarks present
	Important vistas or panoramas in/out of the area	Unimportant or no vistas
	Prominent skyline	Not part of skyline
Visual receptors	Large extent or range of key sensitive receptors	Lack of sensitive receptors
	Large number of people see site	Few can see site
	Key view from a sensitive receptor	Views of site are unimportant
	Site is part of valued view	Site does not form a part of a valued view
	Site in key views to/across/out of settlement	Not part of setting of settlement view

Potential to mitigate	Mitigation not very feasible	Mitigation possible
	Mitigation would interrupt key views	Would not obscure key views
	Mitigation would damage local character	Mitigation would not harm local character

Table 2.4 Visual sensitivity matrix

Types of views	L (1)	L/M (2)	M (3)	M/H (4)	H (5)
Visual receptors	L (1)	L/M (2)	M (3)	M/H (4)	H (5)
Potential to mitigate	L (1)	L/M (2)	M (3)	M/H (4)	H (5)
Overall visual sensitivity	3-4 = Low; 5-7 = Med/Low; 8-10 = Med; 11-13 = Med/High; 14-15 = High				

## 2.6 Stage 3: Landscape sensitivity

- 2.6.1 Landscape character sensitivity and visual sensitivity are combined to give the landscape sensitivity (see **Table 2.5**).

Table 2.5 Landscape sensitivity

Visual sensitivity	High	M	M/H	M/H	H	H
	Med/High	M/L	M	M/H	M/H	H
	Medium	M/L	M/L	M	M/H	M/H
	Med/Low	L	M/L	M/L	M	M/H
	Low	L	L	M/L	M/L	M
		Low	Med/Low	Medium	Med/High	High
Landscape character sensitivity						

## 2.7 Stage 4: Contribution of the site to wider landscape and settlement edge

- 2.7.1 Stages 1 and 2 assess the landscape and visual characteristics and sensitivity of each land parcel. The sensitivity of each land parcel to development is also affected by the contribution it makes to the adjacent wider landscape and the influence of the settlement edge. The wider landscape sensitivity of each land parcel is assessed as set out in **Table 2.6**.



Table 2.6 Wider landscape sensitivity

Wider landscape sensitivity	Relationship of the site to the wider landscape
Low wider sensitivity	The site is heavily influenced by the built form of nearby settlement and not an important part of the adjacent wider landscape.
Medium/low wider sensitivity	The land parcel is influenced by nearby settlement and has views of the some parts of the settlement but shares some of the characteristics of the adjacent wider landscape.
Medium wider sensitivity	The site is partly influenced by the settlement but shares many of the characteristics of the wider landscape, with good physical and/or visual links to the wider landscape.
Medium/high wider sensitivity	The site has strong physical and visual links to the wider landscape and these outweigh any minor influences from the adjacent settlement.
High wider sensitivity	The site is an important part of the wider landscape with which it has strong visual and landscape links. The nearby settlement has little or no effect on the site.

2.7.2 The overall landscape sensitivity of each land parcel is determined by combining the wider landscape sensitivity, as assessed above, with the landscape sensitivity from **Table 2.5** to give overall landscape sensitivity as illustrated in **Table 2.6**.

Table 2.7 Overall landscape sensitivity

Landscape sensitivity of the land parcel	High	M	M/H	M/H	H	H
	Med/High	M/L	M	M/H	M/H	H
	Medium	M/L	M	M	M/H	M/H
	Med/Low	M/L	M/L	M	M	M/H
	Low	L	M/L	M/L	M	M
		Low	Med/Low	Medium	Med/High	High
Wider landscape sensitivity						

## 2.8 Stage 5: Landscape value

2.8.1 Landscape value is calculated using a range of factors. The criteria used to assess the value of these factors is explained in **Table 2.7**. Lepus refined the contents of this list during the field work.

*Table 2.8 Landscape value criteria*

Value	Typical criteria	Typical example
High	Very high importance (or quality) and rarity. No or limited potential for substitution	Chilterns AONB
		Aston Rowant SAC, NNR and SSSI
		Ancient Woodland
		Grade I and II* listed buildings and their settings
		Ridgeway National Trail
Medium/High	High importance (or quality) and rarity. Limited potential for substitution	Setting of Chilterns AONB
		Landscape value identified in the Local Plan
		Aston Rowant Conservation Area and setting
		Kingston Blount Conservation Area and setting
		Grade II listed buildings and their settings
		Priority habitats that contribute to landscape character
		Public footpaths
		Bridleways
		Open access land (including) Registered Common Land
Medium	Medium importance (or quality) and rarity. Limited potential for substitution.	Local recreational facilities of community value
Medium/Low	Local importance (or quality) and rarity. Limited potential for substitution.	Local buildings of historic interest and their settings
Low	Low importance (or quality) or rarity.	Area of little value and identified for improvement.

## 2.9 Stage 6: Landscape capacity

2.9.1 The landscape capacity is determined by combining landscape sensitivity with landscape value.

Table 2.9 Landscape capacity

Overall landscape sensitivity	High	M	M/L	L	L	L
	Med/High	M/H	M	M/L	L	L
	Medium	H	M/H	M	M/L	L
	Med/Low	H	H	M/H	M	M/L
	Low	H	H	H	M/H	M
		Low	Med/Low	Medium	Med/High	High
		Landscape value				

Table 2.10 Guide to orders of magnitude used in the definition of landscape capacity

Low capacity	The landscape could not accommodate areas of new development without a significant and adverse impact on the landscape character and visual amenity. Occasional very small scale development may be possible providing it has regard to the setting and form of existing settlement and surrounding landscape character.
Medium / Low capacity	A low amount of development can be accommodated only in limited situations providing it has regard to the setting and form of existing settlement and surrounding landscape character.
Medium capacity	The landscape could be able to accommodate areas of new development in some parts providing it has regard to the setting and form of existing settlement and surrounding landscape character. There are landscape and visual constraints and therefore the key landscape and visual characteristics must be retained and enhanced.
Medium/ High capacity	The area can accommodate larger amounts of development providing it has regard to the setting and form of existing settlement and surrounding landscape character. Certain landscape and visual features in the area may require protection.
High capacity	Much of the area can accommodate significant areas of development providing it has regard to the setting and form of existing settlement and surrounding landscape character.

## 3 Statutory and planning policy framework

### 3.1 National planning policy

3.1.1 On 24th July 2018, the Ministry of Housing, Communities & Local Government launched the revised National Planning Policy Framework (NPPF). It replaces the previous version published six years ago in 2012. From a landscape perspective, the new NPPF continues to place great importance on recognising the intrinsic character and beauty of the countryside, outlining AONB's as having the highest status of protection in relation to conserving and enhancing landscape and scenic beauty. The following paragraphs are of relevance to the consideration of landscape character.

Paragraph	NPPF Quote
20	<i>"Strategic policies should set out an overall strategy for the pattern, scale and quality of development, and make sufficient provision for ... conservation and enhancement of the natural, built and historic environment, including landscapes and green infrastructure, and planning measures to address climate change mitigation and adaptation"</i>
127	<i>"Planning policies and decisions should ensure that developments ... are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities)"</i>
170	<i>"Planning policies and decisions should contribute to and enhance the natural and local environment by:</i> <i>a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);</i> <i>b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland".</i>
171	<i>"Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework".</i>

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*“Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest”.*

3.1.2 In 2015, the Department for Communities and Local Government drew the importance of landscape character to the attention of the Planning Inspectorate. The minister drew attention to several recent appeal cases in which harm to landscape character has been an important consideration in the appeal being dismissed.

3.1.3 Writing about landscape character and prematurity in planning decisions Brandon Lewis (the minister) stated that:

*“I have become aware of several recent appeal cases in which harm to landscape character has been an important consideration in the appeal being dismissed. These cases are a reminder of one of the twelve core principles at paragraph 17 of the National Planning Policy Framework, that plans and decisions should take into account the different roles and character of different areas, and recognise the intrinsic character and beauty of the countryside, to ensure that development is suitable for the local context”.*

## 3.2 District level planning policy

3.2.1 The Development Plan for South Oxfordshire District Council comprises:

- The saved policies from the Local Plan 2011;
- The Core Strategy (adopted in December 2012); and,
- Adopted Neighbourhood Plans.

3.2.2 In addition, SODC is preparing a new Local Plan for the period to 2034. A draft version of the Local Plan 2034 has been published for formal public consultation. This report has been prepared during the public consultation period.

3.2.3 The South Oxfordshire Core Strategy (December 2012) includes the following landscape policy:

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*“Policy CSEN1 Landscape The district’s distinct landscape character and key features will be protected against inappropriate development and where possible enhanced.*

- (i) Where development is acceptable in principle, measures will be sought to integrate it into the landscape character of the area.*
- (ii) High priority will be given to conservation and enhancement of the Chilterns and North Wessex Downs Areas of Outstanding Natural Beauty (AONBs) and planning decisions will have regard to their setting. Proposals which support the economies and social well being of the AONBs and their communities, including affordable housing schemes, will be encouraged provided they do not conflict with the aims of conservation and enhancement.*
- (iii) The landscapes and waterscapes of the River Thames corridor will be maintained and where possible enhanced as will the setting and heritage of the river for its overall amenity and recreation use”.*

### 3.3 Emerging Local Plan update

3.3.1 SODC is preparing the Local Plan 2034. This is an emerging plan currently published in draft form for public consultation, therefore, the policies within the plan may not carry weight in decisions relating to planning applications. Nevertheless, it is worth noting some of the relevant emerging policy.

3.3.2 In relation to the protection of landscape character and other environmental assets, proposed policy ENV1 states:

*“Policy ENV1: Landscape and Countryside*

- 1. The highest level of protection will be given to the landscape and scenic beauty of the Chilterns and North Wessex Downs Areas of Outstanding Natural Beauty (AONBS):*
  - Development in an AONB or affecting the setting of an AONB will only be permitted where it conserves, and where possible, enhances the character and natural beauty of the AONB*
  - Development in an AONB will only be permitted where it is appropriate to the economic and environmental wellbeing of the area or promotes understanding or enjoyment of the AONB*
  - Major development in an AONB will only be permitted in exceptional circumstances and where it can be demonstrated to be in the public interest*
  - Development proposals that could affect the special qualities of an AONB (including the setting of an AONB) either individually or in combination with other developments, should be accompanied by a*



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*proportionate Landscape and Visual Impact Assessment. AONB management plans will be a material consideration in decision making.*

- 2. South Oxfordshire's landscape, countryside and rural areas will be protected against harmful development. Development will only be permitted where it protects and, where possible enhances, features that contribute to the nature and quality of South Oxfordshire's valued landscapes, in particular:*
  - i) Trees (including individual trees, groups of trees and woodlands), hedgerows and field boundaries;*
  - ii) Irreplaceable habitats such as ancient woodland and aged or veteran trees found outside ancient woodland*
  - iii) The landscapes, waterscapes, cultural heritage and user enjoyment of the River Thames, its tributaries and flood plains;*
  - iv) Other watercourse and water bodies;*
  - v) The landscape setting of settlements or the special character and landscape setting of Oxford;*
  - vi) topographical features;*
  - vii) areas or features of cultural and historic value;*
  - viii) important views and visually sensitive skylines; and*
  - x) aesthetic and perceptual factors such as tranquillity, wildness, intactness, rarity, scale, enclosure.*
- 3. Development which supports economic growth in rural areas will be supported provided it conserves and enhances the landscape, countryside and rural areas.*
- 4. The Council will seek the retention of important hedgerows (according to the definition within the Hedgerow Regulations 1997). Where retention is not possible and a proposal seeks the removal of a hedgerow, the Council will require compensatory planting with a mixture of native hedgerow species".*

3.3.3 SODC has identified Aston Rowant and Kingston Blount as 'smaller villages' in the settlement hierarchy in which may accommodate infill development to maintain the vibrancy of the rural community, as set out in paragraph 4.14 which states.

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*Our vision and objectives for South Oxfordshire recognise the rural nature of our District and the importance of our rural settlements in contributing to what makes South Oxfordshire such a beautiful and prosperous place to live. Our strategy for the Local Plan is to continue to ensure that all our communities thrive and that everyone has access to services within a short distance. This is achieved through our network of settlements and the settlement hierarchy, which ensures development takes place within the more sustainable locations of the district.*

3.3.4 Proposed policy H8 'Housing in the Smaller Villages', states,

*"1. The Council will support development within the smaller villages in accordance with Policy H16". (The policy for Infill Development and Redevelopment) "Where a Parish Council wishes to prepare a Neighbourhood Development Plan and make housing allocations within it to support further growth, the Council will support this. 2. Those Neighbourhood Development Plans will need to demonstrate that the level of growth they are planning for is commensurate to the scale and character of their village, and this is expected to be around a 5% to 10% increase in dwellings above the number of dwellings in the village in the 2011 census (minus any completions since 1 April 2011). 3. Neighbourhood Development Plans allocating sites on greenfield sites in these locations should consider how development can meet the bespoke needs of their village, including housing mix, tenure and the amount of affordable housing".*

## 3.4 The Chilterns AONB

3.4.1 The Chilterns AONB lies at the southern boundary of the study area and southern parts of the parish lie within the designation. The location of the boundary to the AONB in relation to the study area and the parish are shown on **Figure 3.1** which illustrates landscape related designations.

3.4.2 The land within the study area has the potential to be considered as part of the 'setting' to the AONB. These matters are considered within the methodology for this assessment in relation to judgements about the value of landscape, visual amenity and views.

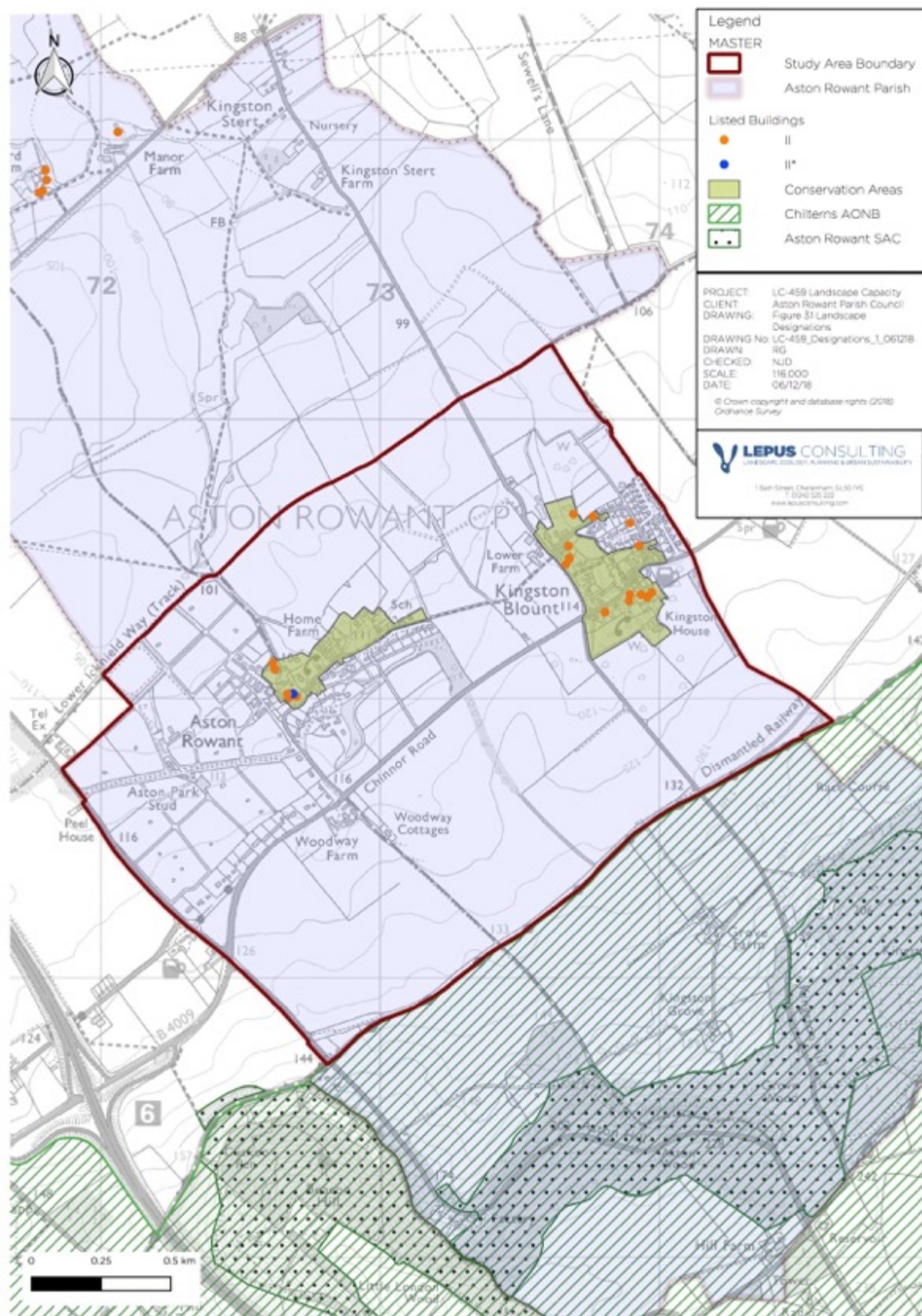


Figure 3.1 Landscape related designations

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- 3.4.3 AONBs are nationally designated landscapes with the same level of statutory protection as that afforded to National Parks. The statutory protection afforded to these designated landscapes was first set out in the National Parks and Access to the Countryside Act (1949) and later by the Countryside and Rights of Way (CROW) Act (2000). The primary purpose of AONB designation is preserve and enhance the natural beauty of the landscape.
- 3.4.4 The NPPF 2018 provides policy protection for AONBs in relation to the development of local planning policy and decision making. Paragraph 172 in relation to AONBs states,
- Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest.*
- 3.4.5 The Chilterns AONB extends from the River Thames in the south to the edges of Luton in the north. It was designated in 1965 and following a boundary review in 1990 the AONB now extends to 833 square kilometres.
- 3.4.6 The Chilterns AONB Management Board is responsible for advising Local Authorities in fulfilling their duties in relation to plans and decisions affecting the AONB. The Management Board has published the Chilterns AONB Management Plan 2014-2019. This document states,
- 3.4.7 *The Chilterns AONB was designated for the natural beauty of its landscape and its natural and cultural heritage. In particular, it was designated to protect its special qualities which include the steep chalk escarpment with areas of flower- rich downland, woodlands, commons, tranquil valleys, the network of ancient routes, villages with their brick and flint houses, chalk streams and a rich historic environment of hillforts and chalk figures.*
- 3.4.8 The Management Plan identifies fourteen 'special qualities' of the AONB, including,



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- 3.4.9                    *SQ2 The main ridge of the escarpment provides fine long views across the lower lying vales to the north and west.*
- 3.4.10                  *SQ11 The Chilterns has an extensive network of ancient routes, roadside hedges and sunken lanes. The Ridgeway (Icknield Way), reputedly the oldest road in the country, is elevated along the entire length of the Chilterns, linking Wessex with East Anglia.*
- 3.4.11                  *SQ12 Villages and farmsteads with brick and flint cottages, churches and timber barns are scattered throughout the area. The more ancient settlements tend to nestle alongside streams and rivers or springs at the foot of the escarpment. More recent settlements sprung up on the higher ground, strung along the edge of commons and beside droving routes.*
- 3.4.12                  Under 'Key Issues', the Management Plan notes the following,
- 3.4.13                  Key Issue 24: Setting of the AONB
- 3.4.14                  *The potential impact of development in the area surrounding the AONB needs to be given greater weight as inappropriate and poorly designed development can significantly affect the AONB and its enjoyment. This plan places considerable emphasis on the need to value the setting of the AONB as an integral part of the efforts to conserve the landscape of the AONB itself and should be reflected in neighbouring Local Plans.*
- 3.4.15                  The Chilterns Management Plan also sets out their own policies. Of relevance to this study are the following,
- 3.4.16                  *Policy L5: Developments which detract from the Chilterns special character should be resisted.*
- 3.4.17                  There are a number of policies that relate to residential development proposals within the AONB, however, the following policy appears of particular relevance to proposals within the setting of an AONB.
- 3.4.18                  *Policy D9 Full account should be taken of the likely impacts of developments on the setting of the AONB.*

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- 3.4.19 *There is increasing pressure for both large- and small-scale development within the setting of the AONB. Greater appreciation is required of what the likely impacts may be of such development, particularly as the views both out of and back to the AONB are fundamental to the enjoyment of the AONB itself.*
- 3.4.20 The Chilterns Conservation Board has published a Position Statement in relation to the setting of the AONB. This document defines setting as follows,
- 3.4.21 *“The Board considers that, although it does not have a defined geographical boundary, the setting of the Chilterns AONB is the area within which development and land management proposals, by virtue of their nature, size, scale, siting, materials or design could be considered to have an impact, either positive or negative, on the natural beauty and special qualities of the Chilterns AONB”.*
- 3.4.22 The Appendix A of the Setting Position Paper sets out the statutory and policy framework that provides protection to the setting of AONBs.



## 4 Published landscape character assessments

### 4.1 National landscape character assessment

4.1.1 At a national level, Natural England has divided England into areas of similar landscape called National Character Areas (NCAs). The scale of these is such that they include large swathes of the English countryside and the level of homogeneity amongst landscape features is limited.

4.1.2 The parish of Aston Rowant is located within the Upper Thames Clay Vales NCA (No. 108) and the Chilterns (No. 110) as identified by Natural England (see **Figure 4.1**). The boundary to the Chilterns NCA and the Chilterns AONB designation appear to be concurrent within the study area, following the alignment of Ridgeway National Trail.

4.1.3 The parish is primarily within the Upper Thames Clay Vales NCA which is described as:

- Open, gently undulating lowland farmland on Jurassic and Cretaceous clay
- The Oxfordshire and Wiltshire Vales are characterised by 18th- and early 19th- century enclosure landscapes of small woods and thorn hedges.
- Settlement is sparse on flood plains, apart from at river crossings, where there can be large towns...
- Market towns and villages are strung along the springlines of the Chilterns and Downs.
- Major routes include ... the M40 ... and The Ridgeway and Thames Path National Trail.

4.1.4 The Chilterns NCA provides the following description:

- The extensively wooded and farmed Chilterns landscape is underlain by chalk bedrock;
- Small streams flow on chalk down some of the dip slope valleys or from the scarp foot, passing through numerous settlements.
- The major sources of public water supply for the Chilterns and the London area are the chalk aquifer and the Thames.
- Aston Rowant SAC (Special Area of Conservation) protects an internationally important juniper scrub population.

4.1.5 Further information on these NCAs is presented in **Appendix A**.

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## 4.2 County landscape context

4.2.1 The current Landscape Character Assessment for the county of Oxfordshire is the Oxfordshire Wildlife and Landscape Study (OWLS). The OWLS is an investigation of landscape character and biodiversity across the county and was published in 2004.

4.2.2 There are 24 landscape types described across Oxfordshire. These are made up of individual landscape description units and patterns of geology, topography, land use and settlements.

4.2.3 Within the study area there are four landscape types, broadly forming bands on an east west alignment following the scarp slope of the Chilterns. From south to north these Landscape Types (LT) comprise:

- Wooded Farmland;
- Wooded Estate Slopes and Valley Sides;
- Estate Farmlands; and
- Rolling Clayland.

4.2.4 A map showing the location of these LTs within the parish is shown in **Figure 4.1**.

## 4.3 District landscape context

4.3.1 The South Oxfordshire Landscape Character Assessment was published in 2017 and was prepared to inform the development of the emerging SODC Local Plan 2034. It now forms part of the evidence base to the plan making process.

4.3.2 The assessment divides the entire district of South Oxfordshire into Landscape Character Areas (LCAs) and Landscape Types (LTs). LCAs are the unique individual geographical areas in which landscape types occur. In the district assessment there are eleven LCAs.

4.3.3 LTs are distinct types of landscape that are relatively homogeneous in character and can occur anywhere in the country. There are 24 LTs within the assessment.

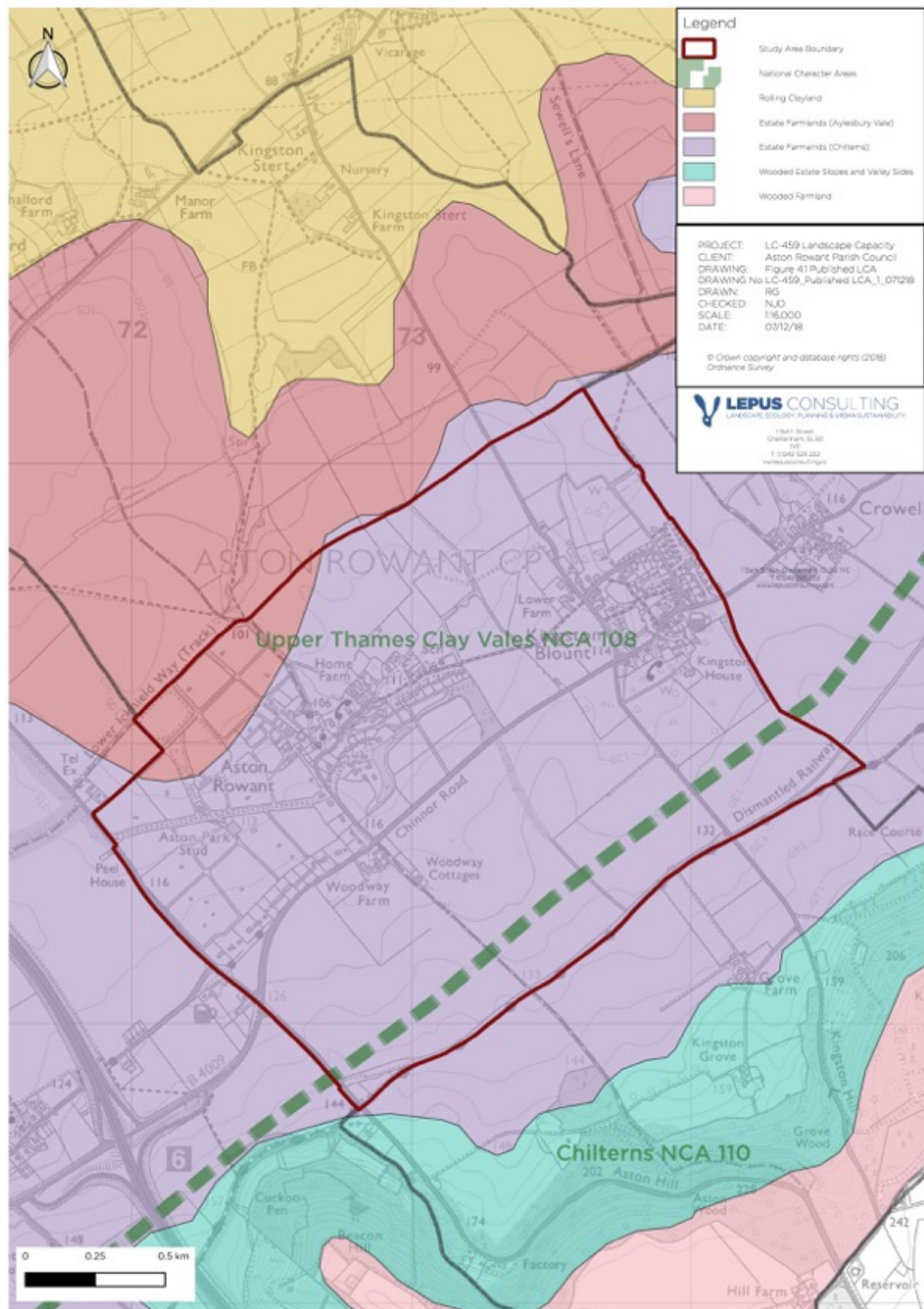


Figure 4.1 Published landscape character assessments

#### 4.3.4

The general descriptions for the South Oxfordshire Landscape Character Assessment state the following which are of relevance to this study:

- To the east, the Chiltern Hills form a highly distinct land mass with its steep escarpment facing the vale to the north and its dip slope descending gently into the Thames Valley to the south. Where the chalk is exposed along the escarpment and valley sides, the soils are thin and calcareous and support remnant chalk grassland and scrub woodland. On the plateau and dip slope, however, the chalk is overlain by extensive deposits of clay-with-flints...
- Traditional building materials closely reflect these broad geological differences, with ...brick and tile on the clays of the vale, and brick and flint (with locally grown timber) characterising the Chilterns and Wessex Downs.
- Important prehistoric thoroughfares, like the Icknield Way, also followed the outcrops of dry, permeable rocks and formed a focus for early settlement in the district.
- The early middle ages ... saw enclosure and clearance of 'wastes' and colonisation of previously unpopulated areas, such as the wooded Chilterns dip slope and marshy valley bottoms.
- ...earlier and more irregular enclosures were largely overwhelmed by the major parliamentary enclosures of the eighteenth and nineteenth centuries which transformed the landscape of much of South Oxfordshire and endowed it with an almost 'blueprinted' pattern of square or rectangular fields surrounded by straight thorn hedges. New straight roads were also introduced with wide grass verges, replacing the narrow winding lanes. The Chiltern Hills largely escaped this revolution and still display many typical characteristics of 'ancient countryside' which contrast with the 'planned landscape' of the Vale.
- This century has ... seen the growth and expansion of towns and villages throughout southern England. The proximity of South Oxfordshire to London and improvements in road and rail communications have placed significant pressures on the district to accommodate new housing. Some settlements, such as Didcot, have expanded rapidly with a significant effect upon the local landscape character. Elsewhere, however, much of this pressure has been successfully resisted, particularly in the smaller rural settlements.
- A less obvious effect of the prosperity of this area, however, is the gradual 'suburbanisation' and 'gentrification' of many of the district's villages and a gradual erosion of local distinctiveness... The design guide for South Oxfordshire aims to improve the standard of design in developments in the district.
- In planning for future change within South Oxfordshire, the main challenge is to provide a suitable balance between the contrasting claims for housing and business expansion on the one hand and

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maintenance of the generally unspoilt rural qualities of the landscape on the other.

4.3.5 In relation to biodiversity and ecologically designated assets the assessment identifies the Aston Rowant Special Area of Conservation (SAC), an internationally recognised ecological designation which lies to the south of the study area as shown on **Figure 3.1**. The Aston Rowant SAC is designated for *Juniperus communis* formations on heaths or calcareous grasslands and *Asperulo- Fagetum* beech forests.

4.3.6 The parish as a whole lies within the following LCAs, the descriptions for which are summarised in **Appendix B**.

- LCA3: The Clay Vale;
- LCA5: The Eastern Fringes; and
- LCA8: The Chilterns Escarpment.

4.3.7 The descriptions for the LCAs are helpful in setting out the landscape context in which the study area lies. The following chapter sets out the more detailed findings of the desk top and field study investigation of the baseline landscape circumstances relevant to this study. **Chapter 6** then considers these baseline conditions in relation to the sensitivity of the landscape and its potential capacity to accommodate change.

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## 5 Baseline information

- 5.1.1 The published landscape character assessments provide useful contextual information in relation to the parish of Aston Rowant, however, it lacks sufficient detail for the consideration of the ability of the landscape in the study area to accommodate the type of development proposed. As set out above, this assessment will consider the sensitivity of the landscape to accommodate small scale residential development of up to seventeen dwellings within the study area.
- 5.1.2 The consideration of the ability of the landscape to accommodate change starts with an understanding of the key characteristics of the receiving environment and the potential for the proposed change to be accommodated while maintaining these key characteristics.
- 5.1.3 The following descriptions have been informed by a review of available desk top resources and considered on site through a field study. The field study was undertaken on 30<sup>th</sup> November 2018 in dry, clear conditions. The field study was undertaken by walking and driving rights of ways and highways and visiting publicly accessible open spaces to 'ground-truth' the findings of the desk-top assessment.

### 5.2 Natural features

#### Geology and landform

- 5.2.1 The parish as a whole has a linear alignment from north west to south east. The prominent Chilterns AONB lies on the elevated land in the south, reaching a maximum height of approximately 240mAOD. The steep chalk escarpment is characterised by a mosaic of farmland and woodland. In areas, the thinner chalk soils made farming, and particularly ploughing, more difficult however, such soils have led to the development of interesting ecological habitats such as calcareous grassland.
- 5.2.2 From the escarpment of the Chilterns Hills in the south of the parish, the land levels fall away towards the vale in the north which lies at approximately 80mAOD. The central part of the parish lies on Lower Greensand while in the northern part soils are influenced by the heavier Gault clay of the vale.



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- 5.2.3 The underlying geology is reflected in the nature of the agricultural landscape of this part of the parish. The provisional Agricultural Land Classification data available from the MAGIC government website, shows a band of land overlying the villages as lying with the higher Grade 2 agricultural land with areas of Grade 3 on either side of this and areas of Grade 4 in the north of the parish.

### **Hydrology**

- 5.2.4 The northern parish boundaries are defined by small watercourses, including the Holbrook. These watercourses emerge along the foot of the chalk slope and are thought to have been where settlements initially developed. A series of 'spring line' villages emerged along the foot of the hills, including Aston Rowant and Kingston Blount, which take advantage of the good water supply.
- 5.2.5 These small watercourses drain northwards towards the River Thame. Drainage is occasionally poorer and in these areas of waterlogged soils pasture is the more common land use.
- 5.2.6 The part of the Chilterns Hills within the southern part of the parish includes an aquifer which is an important contributor to water supplies for London and the south east.

### **Landcover and vegetation**

- 5.2.7 As described above, the underlying geology and drainage patterns have strongly influenced the development of soils and subsequent land uses.
- 5.2.8 The elevated Chilterns Hills are overlain with a mosaic of farmland and woodland. Within the parish, beech woodlands are a prominent feature of this landscape.
- 5.2.9 The scarp slope leads to the higher grade agricultural soils of the vale which are now characterised by the strongly agricultural landscape. The land in this zone appears to be primarily used for arable crops such as cereals and brassicas. Field parcel sizes are often larger in this area and there may be some loss of boundary features such as hedgerows, probably as a result of agricultural intensification.
- 5.2.10 In some areas, pasture is the predominant land use, possibly where drainage is poorer, such as in proximity to watercourses, or where the soils have a greater clay content and are heavier.

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- 5.2.11 In areas there is a strong rectilinear pattern of hedgerows with hedgerow trees, which are likely to reflect the enclosures of the 18<sup>th</sup> and 19<sup>th</sup> centuries. This pattern is interspersed with more irregular patterns of vegetation, particularly associated with the winding courses of streams or the historic routes of tracks and rights of way. In some parts of the study area, particularly to the south of Chinnor Road, there appears to be some loss of hedgerows, probably as a result of agricultural intensification. This has led to a more open landscape at the foot of the AONB offering opportunities for more expansive views towards the wooded hills from many locations.
- 5.2.12 Both Aston Rowant and Kingston Blount have seen the development of large manor houses and associated landscaped estates during their history. This has led to a legacy of a distinctive estate parkland landscape character in close proximity to both village centres. The distinctive features of this type of landscape are the scattered mature, and potentially veteran, trees set within pasture, traditionally grazed by livestock, although now likely to be grazed by horses. Avenues of trees are also noticeable elements still discernible in the landscape from some locations. These avenues may have lined tracks or access routes. Tree species include horse chestnut and large-leaved lime, amongst others.
- 5.2.13 Small blocks of, often native, woodland are scattered through the study area. Tree species include oak, ash, beech, cherry and field maple, amongst others. These blocks can be rectilinear or more irregular in shape. In the wider context the Chiltern Hills are noted for their beech woodlands, particularly on the scarp slope to the hills where their flowing form reflects the nature of the underlying landform.
- 5.2.14 In the wider context there are a variety of sites designated for their biodiversity, including Aston Rowant Special Area for Conservation (SAC) which is also a Site of Special Scientific Interest and National Nature Reserve. It is designed for its flower- rich chalk grassland, beech woodland and juniper scrub. The Chilterns Beechwoods SAC is designated for its beech forests, semi-natural dry grasslands and scrubland on calcareous substrates. SAC's are designated under the European Commission's Habitats Directive. Such sites are considered to be those in most need of protection at the European Level.



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## 5.3 Cultural and social

### Chilterns AONB and setting

5.3.1 The Chilterns AONB extends from the River Thames in the south to the edges of Luton in the north. It has been designated for the natural beauty of its landscape and its natural and cultural heritage. In particular, the steep chalk escarpment with areas of flower- rich grassland, woodlands, commons, the network of ancient routes, villages with their brick and flint houses, chalk streams and a rich historic environment.

5.3.2 The southern boundary of the study area is contiguous with the boundary to the AONB; this is also the route of the Ridgeway National Trail. As described above, AONBs are nationally designated landscapes with the same level of protection as that afforded to National Parks. Within AONBs and their 'settings' changes and proposals must have due regard to the conservation and enhancement of 'natural beauty'. This should be considered in relation to changes to landscape character as well as changes to views towards and from the AONB.

### The Ridgeway and Lower Icknield Way

5.3.3 The location of rights of way, National Trails and publicised walking routes have been taken from the Ordnance Survey Explorer mapping and using the Oxfordshire Definitive Map. A copy of the latter is provided in **Appendix C**.

5.3.4 The Ridgeway and Lower Icknield Way are thought to follow the alignment of historic routes through the landscape. They are likely to reflect routes where access through the landscape was more straightforward, avoiding the steeply sloping landform of the scarp slope and the wetter or waterlogged ground found in the vale.

*The Ridgeway, also known as the Upper Icknield Way, is classified as a National Trail walking route and also has bridleway rights. It is an 87 mile ancient route, thought to be Britain's oldest 'road'<sup>4</sup>.*

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<sup>4</sup> <https://www.nationaltrail.co.uk/ridgeway/information>

- 5.3.5 The route of the Ridgeway in this location follows the alignment of the former Watlington and Princes Risborough railway line. Aston Rowant Station was located at the junction of the line with what is now the A40/London Road; there was a halt at Kingston Blount. The line was closed in 1957.
- 5.3.6 Users of National Trails within the open countryside and within a designated landscape are likely to be at that location in order to enjoy the views and are assessed as some of the most sensitive receptors in relation to changes to views.
- 5.3.7 The Lower Icknield Way is also thought to be an ancient trackway from Norfolk to Wiltshire. This route forms the northern boundary to the study area from where there are views towards the villages of Aston Rowant and Kingston Blount as well as views to the north across the undulating landform of the vale.

#### **Other rights of way**

- 5.3.8 There are a small number of other rights of way within the study area and local context. The following rights of way and associated referencing are taken from the Oxfordshire Definitive Map<sup>5</sup>, a copy of which is provided in **Appendix C**.
- 5.3.9 Route 115/19 is a right of way which connects the Ridgeway to Chinnor Road in a north westerly direction towards Aston Rowant, emerging opposite Aston Rowant Road. From Church Lane, bridleway 115/15 follows a similar north westerly alignment and connects to Lower Icknield Way at a point known locally as Five Ways. From this point, five rights of way radiate in a broadly north westerly direction towards other smaller settlements such as Chalford, Kingston Stert and Postcombe.
- 5.3.10 From the northern side of Kingston Blount right of way 115/1 passes through Kingston Blount playing fields before following a field boundary to connect with the Lower Icknield Way. Right of way 115/7 connects the two villages themselves.

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<sup>5</sup>

<https://www2.oxfordshire.gov.uk/cms/sites/default/files/folders/documents/environmentandplanning/countryside/definitivemap/defmapPDFs/SU79NW.pdf> (accessed 03/12/18)

- 5.3.11 Kingston Blount has a strong cruciform layout, based on a rectilinear arrangement of small rural highways formed by High Street, Pleck Lane, Brook Street and Stert Road. Two rights of way form a cross within this broadly rectangular shape. These rights of way may have provided historic access to the open space within the centre of the village, historically associated with specific ‘crofters’ cottages<sup>6</sup>.
- 5.3.12 The 1883 Ordnance Survey map (a copy of which is provided in **Appendix D**) and online sources<sup>7</sup> indicate that many of the right of way described above may follow the alignment of historic tracks or routes.

### **Conservation areas and settings**

- 5.3.13 Both Aston Rowant and Kingston Blount benefit from having conservation areas protecting the historic core of the settlements. To date, however, there are no published conservation area appraisals for either conservation area<sup>8</sup>. The boundaries to the conservation areas are shown on **Figure 3.1**.

### **Listed buildings**

- 5.3.14 The historic nature of the settlements is reflected in the locations and types of listed buildings within the village centres.
- 5.3.15 Within Aston Rowant the listed buildings are focused on Church Lane and include the Grade II\* Church of St Peter and St Paul and Grade II assets within the church grounds, such as the war memorial and chest tombs. The two other listed buildings are 20 Church Lane and Aston Cottage.
- 5.3.16 There are thirteen Grade II listed buildings and structures within Kingston Blount, focused around the historic rectilinear road layout. These include: Ferndale House and The Old Tudor House and its associated outbuildings on High Street; two properties on Park Lane; Chiltern Cottage and Old Croft on Pleck Lane; Little Thatch, Moat Manor and Brookside on Brook Street; and, Town Farm and the Granary on Stert Road.

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<sup>6</sup> ‘Heritage Statement In Respect of Land Adjacent to Orchard House’, June 2018 prepared to support the associated planning application by Asset Heritage Consulting

<sup>7</sup> [www.british-history.ac.uk/vch/oxon/vol18/pp16-43](http://www.british-history.ac.uk/vch/oxon/vol18/pp16-43) (accessed 27/11/18)

<sup>8</sup> Telephone conversation with South Oxfordshire Council November 2018

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### **Distinctive settlement characteristics: Aston Rowant**

- 5.3.17 Both Aston Rowant and Kingston Blount are some of the 'spring line' villages that developed on the spring line below the Chiltern Hills to take advantage of the water supply. Traditionally nucleated settlements both of these small villages have accommodated more recent development on more modern development patterns.
- 5.3.18 Historically, Aston Rowant appears to have centred around the a small number of properties on Church Lane and the Church of St Peter and St Paul itself, a number of which now benefit from protection as listed buildings. The village then appears to have developed along what is now called The Green which ends in a cul-de-sac arrangement in proximity to the local primary school.
- 5.3.19 Aston House once lay to the southern side of The Green. The Manor House was described as one of the 'most remarkable seats in the county'<sup>9</sup>. This source also states that the history of the manor house at Aston Rowant may go back to 1352.
- 5.3.20 It is likely that John Clerke rebuilt the existing house following his acquisition of the manor in 1647. The same source also describes the changes made by General Caillaud who bought the property in 1769 and died at Aston in 1812. These later changes may have included the addition of the ornamental lake with an island and changes to the grounds to a less formal layout than previously. The estate was sold in 1951 and became the store for Grass Products Ltd. and the garden was converted to a market garden. A fire in 1957 gutted the house. Today, a number of detached family homes occupy the former site of Aston House.
- 5.3.21 The 1883 OS map shows Aston House and its associated gardens, with the lake and parkland landscape extending towards the west and south. Some elements of this landscape history can still be 'read' on the ground today. From Aston Rowant Road there are views across the field, used for grazing, towards the 'fish pond', with individual mature trees and the wooded copse visible in in the middle distance. The metal post and rail fencing further adds to the estate parkland character.

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<sup>9</sup> [www.british-history.ac.uk/vch/oxon/vol18/pp16-43](http://www.british-history.ac.uk/vch/oxon/vol18/pp16-43) (accessed 27/11/18)



*Figure 5.1 View from Aston Rowant Road towards the fish pond*



*Figure 5.2 The village green at Aston Rowant*



5.3.22 Following The Green beyond the Church of St Peter and St Paul, views open out across the village green. This a relatively large open space at the heart of the village and is laid to grass with numerous scattered individual mature trees, creating a sylvan character. While now in private ownership, the village green is used for community events, namely the Aston Rowant Village Fete which takes place annually in the summer. The Green is also used as an informal play space. The dwellings surrounding the village green date predominantly from the 18<sup>th</sup> and 19<sup>th</sup> centuries. Public right of way 115/7 connects to the end of The Green, adjacent to Aston Rowant Church of England Primary School.

5.3.23 Aston Park Stud, Aston Rowant Stud and the Fred Hodges Horse Training Centre are located in proximity to the village centre. Aston Park Stud has a main access on the A40/London Road. The presence of equine businesses and leisure activities are a frequent land use in and around the village and adds to the rural character of the settlement.



*Figure 5.3 Home Farm off The Green, Aston Rowant*

5.3.24 As described in the published landscape character assessments, the character of historic built form frequently includes the use of red brick with flint infill and occasionally herringbone brick infill. Plain clay tiles are a frequent roofing material.

5.3.25 There are small areas of more recent development emerging during the 1960's and 1970's, including Plowden Park and Aston Park, as well as the linear development along Aston Rowant Road and Chinnor Road. These dwellings are typically larger detached family houses with substantial gardens. The characteristics of these more recent developments vary.

#### **Distinctive settlement characteristics: Kingston Blount**

5.3.26 Kingston Blount, lying at the eastern boundary of the parish, has historically been the larger of the two villages. As described above, it has a strong rectilinear arrangement, with the road layout forming an outer rectangle and rights of way crossing through the centre. Historically, four field parcels lay within this arrangement, although one is now developed with houses with access provided by Old Croft Close. These field parcels may have been used by local village residents for grazing or growing.



*Figure 5.4 The field parcels in the centre of Kingston Blount*



*Figure 5.5 The village green at Kingston Blount*

- 5.3.27 The High Street passes along the southern edge of the village and is associated with a number of 16<sup>th</sup> and 17<sup>th</sup> century cottages including the Old Tudor House. A number of 18<sup>th</sup> and 19<sup>th</sup> century properties are also located round the cruciform arrangement of streets. Some of the dwellings are timber-framed and a number of cottages have retained their thatched roofs, adding to the rural character of the village.
- 5.3.28 The village green at Kingston Blount is located to the east of Stert Road. This is a small open space which is grassed with some mature individual trees. It creates a sense of openness and visually reads as a shared community space.
- 5.3.29 Kingston House, located to the south of the High Street/Chinnor Road was built in 1855. Today the house is surrounded by a parkland landscape with grassland grazed by horses scattered with numerous mature tree specimens. Post and rail fencing adds to the parkland character. The proximity of the parkland estate landscape in close proximity to the settlement is a characteristic shared with Aston Rowant and creates a sense of cohesive character between the two settlements.





*Figure 5.6 The estate parkland landscape at Kingston House*

- 5.3.30 In both villages, many of the highways have a distinctively rural treatment. Few of the streets have footways and pedestrians and vehicles have shared use of these routes.

#### **Open spaces and community assets**

- 5.3.31 Kingston Blount benefits from having a local playing field, located on the northern side of the village, with access provided off Baker's Piece. The playing field is equipped with football goal posts and a good range of play equipment. The village hall is also located within this space and there are a number of car parking spaces available.
- 5.3.32 The community benefits from the provision of allotments in Kingston Blount accessed off Brook Street, with a second pedestrian access connecting to the playing fields towards Pleck Lane. The allotment site appears to be well used. The historic map from 1883 shows allotments on this site. At that time, the area given over for allotments appears to be larger and extend further north over a field parcel which is now pasture. Allotment sites have a distinctive character of their own with a small scale, intricate, rectilinear pattern created by the size of the growing beds and the associated sheds and other equipment.

- 5.3.33 Aston Rowant and Kingston Blount also benefit from the provision of two cricket pitches. These pitches are located between the two villages. Aston Rowant Cricket Club House is accessed from Chinnor Road. Public Right of Way 115/7 connects the two villages and passes between the two cricket pitches. The pitches appear to be well maintained. Both pitches are actively used through the summer. The Aston Rowant Cricket Club comprises five local teams; the cricket pitches are also used for minor county cricket matches and have been used for women's international matches.



*Figure 5.7 Aston Rowant Cricket Club with the Chiltern Hills in the background*

## 5.4 Private gardens

- 5.4.1 Both of the villages have a strong rural character created by a number of characteristics as set out in the paragraphs above. The gardens associated with residential properties in the villages contribute to this sense of rural character through the types of boundary treatments and the presence of mature garden plants and trees. Boundary treatments which contribute to the sense of rural character include the use of brick and flint for garden walls; hedgerows of non-native garden species are also a frequent feature. Mature trees are a noticeable feature within the villages and include a wide range of native and non-native species including horse chestnut, large-leaved lime, beech, redwood, pines, silver birch, weeping willow, poplar and purple plum, amongst others.

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## 5.5 Publicly accessible views

- 5.5.1 The desk-based assessment and field study have identified the visual characteristics and sensitivities of the study area. The locations of representative viewpoints are shown on **Figure 5.8**.



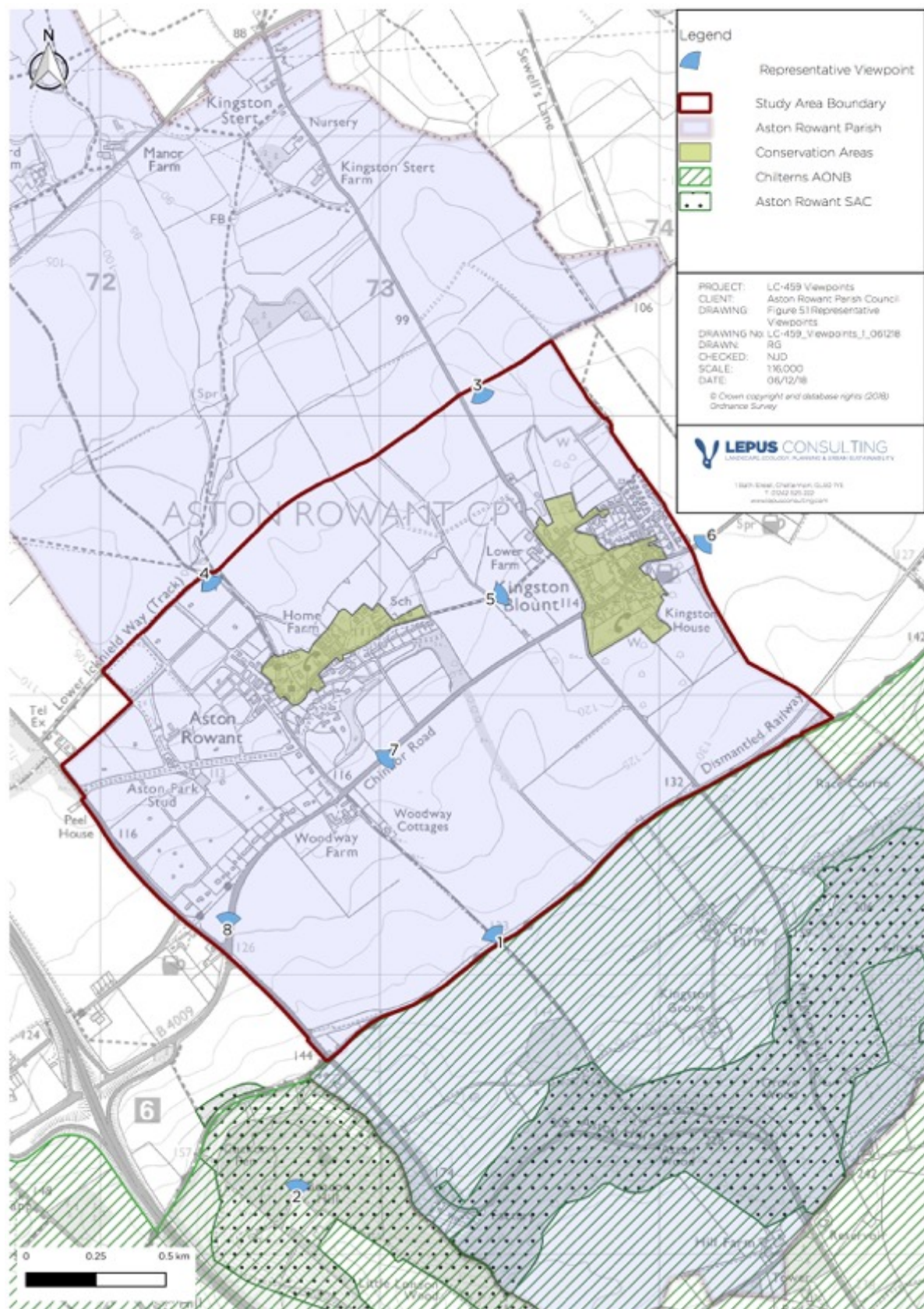


Figure 5.8 Representative viewpoints

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## Views from the Chilterns AONB

- 5.5.2 As set out in the Methodology chapter, AONBs and their settings are considered to be amongst the most sensitive to visual change in the assessment of landscape sensitivity and capacity. In these locations users are likely be involved in activities where appreciation of the view is an integral part of the activity. Changes to views outside of, but seen from the AONB can also be considered to have an effect on the appreciation of the natural beauty of the AONB itself.



*Figure 5.9 View from the Ridgeway National Trail within the Chilterns AONB*

- 5.5.3 There are views towards the two villages from the Ridgeway National Trail which lies at the southern boundary of the AONB. Within the study area the Ridgeway is frequently bounded by vegetation on either side which limits opportunities for views towards the south. Where there are opportunities for more open views, the southern side of the villages are generally more noticeable. The presence of individual trees and woodlands within and around the settlements serve to create a transition between the open countryside and the villages.



*Figure 5.10 View from Beacon Hill within the Chilterns AONB*

- 5.5.4 There are more open views towards the villages from Beacon Hill which is also the site of the Aston Rowant SAC. This open hill top location affords views across the vale and towards the settlements.

#### **Views from the Lower Icknield Way**

- 5.5.5 The Lower Icknield Way lies at the northern edge of the study area. From this undulating bridleway there are occasional views towards the northern sides of the villages. While the large agricultural fields have an open character the treed context of the settlements themselves serve to integrate the built form into the landscape.
- 5.5.6 There is a small seating area on the Lower Icknield Way at a point known as Five Ways. From this point views are generally shorter distance due to the intervening vegetation, although there are some opportunities for views towards the village of Aston Rowant.





*Figure 5.11 View from Lower Icknield Way Towards Kingston Blount*



*Figure 5.12 View from Lower Icknield Way towards Aston Rowant*

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### **Views from other publicly accessible locations**

- 5.5.7 Public right of way 115/7 connects the two villages of Aston Rowant and Kingston Blount, passing between the cricket grounds. This appears to be a well-used right of way with a rural character.
- 5.5.8 Within Kingston Blount the historic rights of way passing between the principal streets have generally contained views, often as a consequence of more modern boundary treatments, such as close board fencing. Where metal post and rail fencing or more open boundary treatments are used there are occasional opportunities for views across some of the field parcels. These field parcels appear to be used to graze sheep and this adds to the rural character of the village.
- 5.5.9 While users of highways are generally considered to be less sensitive visual receptors, the character of the approaches to the villages from Chinnor Road is also a consideration in the assessment of the capacity of the landscape to accommodate change.



## 6 Findings of the landscape capacity study

- 6.1.1 The findings of the baseline desk study and field study feed into the assessment of landscape sensitivity and capacity. The methodology for the assessment of landscape sensitivity and capacity is set in detail in **Chapter 2** of this report and the findings in relation to each field parcel are provided in the table provided in **Appendix E** and illustrated in **Figure 6.1**.
- 6.1.2 The overall findings of the assessment are that the land parcels within the study area, in general, are sensitive to change and, therefore, only have a modest capacity to accommodate future residential development. This is a substantially rural landscape with a number of sensitive landscape features, a strong sense of character and a visually legible landscape history. The sensitivity of the receiving environment is recognised in the presence of both landscape and heritage designations.
- 6.1.3 Land parcels assessed as having a lower capacity for change (assessed as being in the 'low' or 'medium/low' categories) may have the capacity to accommodate some level of change dependent upon the type of proposals.
- 6.1.4 As set out in the methodology in **Chapter 2** and restated here for clarity:
- 6.1.5 **Low capacity land parcels:** The landscape could not accommodate areas of new development without a significant and adverse impact on the landscape character and visual amenity. Occasional, very small scale development may be possible providing it has regard to the setting and form of existing settlement and surrounding landscape character.
- 6.1.6 **Medium/low capacity land parcels:** A low amount of development can be accommodated only in limited situations providing it has regard to the setting and form of existing settlement and surrounding landscape character.

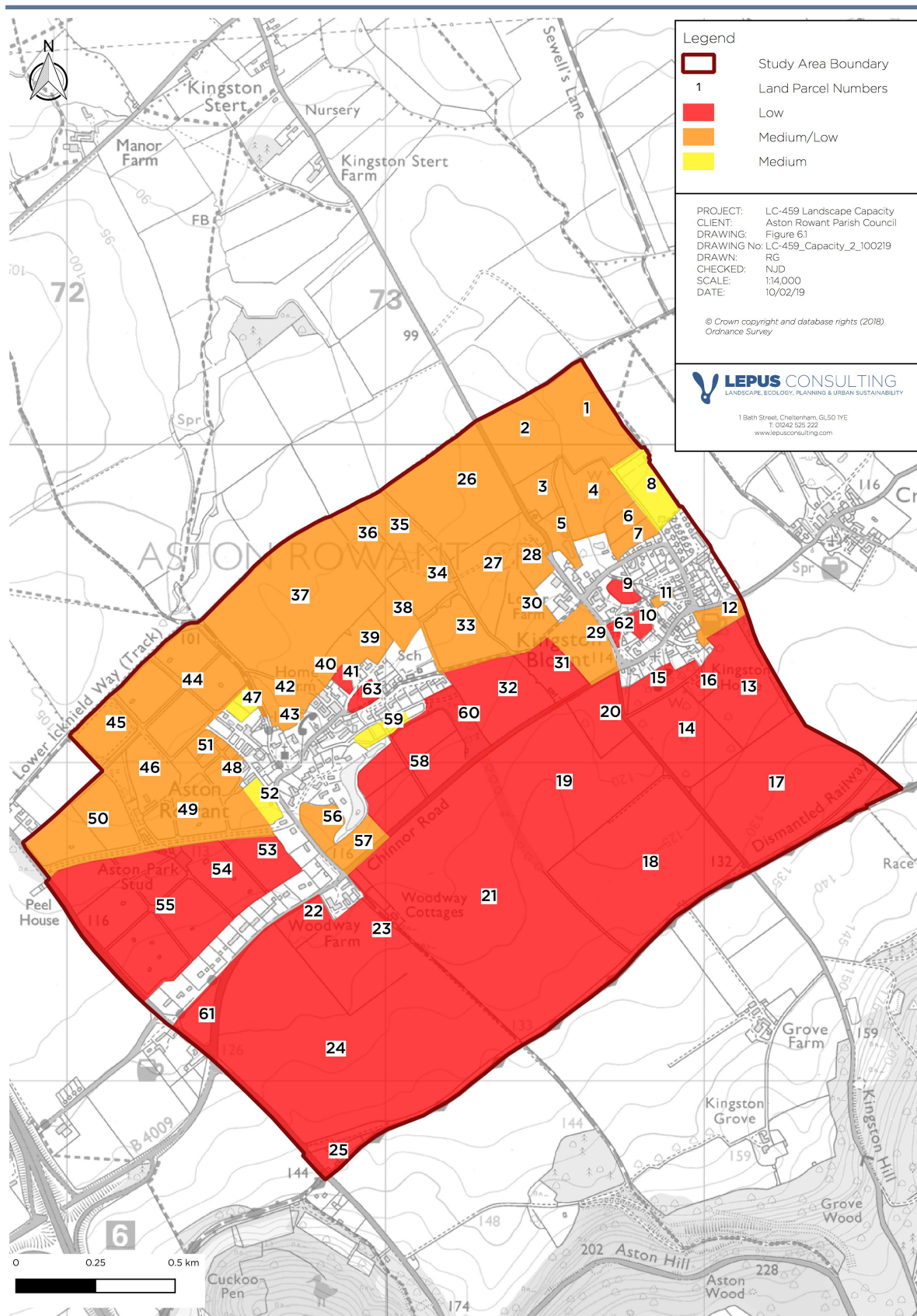


Figure 6.1: Landscape capacity assessment

6.1.7            **Medium capacity land parcels:** The landscape could be able to accommodate areas of new development in some parts providing it has regard to the setting and form of existing settlement and surrounding landscape character. There are landscape and visual constraints and therefore the key landscape and visual characteristics must be retained and enhanced.

6.1.8            The following provides a summary of the findings of the assessment.

## 6.2                **South of Chinnor Road: Land parcels 12-25**

6.2.1            The Chilterns AONB is a nationally designated landscape which is afforded statutory protection in relation to the conservation and enhancement of its natural beauty. The AONB lies at the southern boundary of the study area and its setting is likely to be considered to extend into the southern land parcels, potentially including land in parcels 12 to 25. Development proposals which may affect the appreciation of the natural beauty of the nationally designated landscape are likely to be considered to be within its 'setting'. This is reflected in the landscape value of land parcels 12-25.

6.2.2            In term of visual sensitivity, there are views towards some of these land parcels from a viewpoint at Beacon Hill/Aston Rowant SAC, which lies within the Chilterns AONB. Views from within a designated landscape at a location likely to be considered a 'viewpoint' are considered to be amongst the most sensitive visual receptors in landscape and visual terms. This is reflected in the assessment of visual sensitivity, particularly in relation to those land parcels lying to the southern and western side of Aston Rowant, which are more noticeable in views from Beacon Hill.

6.2.3            Furthermore, there are views across southern land parcels of the study area from the Ridgeway National Trail, which lies at the boundary of the Chilterns AONB within the study area. The Ridgeway follows the lower parts of the scarp slope and in many locations within the study area, views towards the villages are highly filtered by the mature vegetation which lines the route. These elements combine to reduce opportunities for views towards the south.

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- 6.2.4 Where there are gaps in vegetation lining the Ridgeway, there are opportunities for more open views across the land parcels to the south of Chinnor Road, particularly those land parcels lying to the south of Aston Rowant. There is a contrast between the open nature of the agricultural landscape at the foothills of the Chilterns Hills and the more wooded character of the settlements themselves. The weaker landscape structure within these land parcels themselves heightens the sense of openness and reduces the capacity of the landscape to accommodate change without substantial mitigation planting.
- 6.2.5 The estate parkland landscape surrounding Kingston House is associated with mature tree specimens set within the grazed meadows and a more intact hedgerow network. This type of landscape structure serves to provide a more gradual transition between the settled villages and the Chilterns AONB and there are fewer open and expansive views than found to the south of Aston Rowant. These findings are reflected in the assessment of the visual sensitivity of these land parcels.
- 6.2.6 The sensitivity of these landscape and visual features is reflected in the assessment of many of the land parcels within this part of the study area as being of low capacity for small scale residential development.
- 6.3 Land to the north of the villages: Land parcels 1 -7, 26-28 and 34-43**
- 6.3.1 Land parcels at the northern side of the villages of Aston Rowant and Kingston Blount do not lie within a designated landscape and often have a more limited visual relationship with the Chilterns AONB. It is unlikely small scale residential development proposals in these locations would be considered to be within the 'setting' of the AONB. These land parcels are assessed as having a medium landscape value.
- 6.3.2 This is the landscape of the clay vale. The landscape features of greater sensitivity in this location include the wooded copses, the hedgerow network and the winding watercourses which drain northwards to the River Thame. There is a weaker landscape structure in some locations, associated with more intensive agricultural land uses. Land parcels vary in pattern and size, although there are a number of larger land parcels where arable land uses are predominant. This creates a sense of openness and there are often opportunities for views across this part of the study area from the rights of way network.

- 6.3.3 The Lower Icknield Way is a long distance walking trail recognised in published literature. Views from such routes are of greater sensitivity to change than from the local rights of way network and this increases the visual sensitivity of some land parcels. Southern parts of the villages can be seen in some views from the Lower Icknield Way. In general, many of these land parcels are assessed as having a medium/low capacity for change.

## **6.4 Open spaces within settlements: Land parcels 9-11 and 62-63**

- 6.4.1 The historic cores of both settlements are protected by conservation area status. There are no published conservation area appraisals to accompany these designations. The boundary to the designations appear, however, to recognise those buildings likely to be of greater architectural and historic interest, including listed buildings, and also includes the open spaces integral to the villages, including the two village greens, the crofters fields lying within the cruciform layout of Kingston Blount and the orchard within Aston Rowant. The heritage value of such features is outside the scope of a landscape character study, however, both villages have a cohesive rural character, particularly around the historic cores. The interplay between the vernacular built form and open spaces within the settlement is a distinctive characteristic of both villages. These land parcels are assessed as having a low or medium/low capacity for change.
- 6.4.2 The village greens are highly valued and the focus for community activities as well as contributing to the open, rural character of the village centre. Other spaces with community value include the allotments to the north of Brook Street in Kingston Blount and the recreation ground, accessed from Bakers Piece. These open spaces are likely to be highly valued by the local community, however, local community value is only one of the factors feeding into the assessment of landscape capacity. Some of these community assets also appear to have some historic interest. The allotments for example, are shown on the Ordnance Survey 1883 mapping in the same location, and at that time covering a greater extents than today. These various factors feed into the calculation of landscape sensitivity, value and capacity to accommodate change.

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## 6.5 Land between the villages: Land parcels 29-33

- 6.5.1 The published landscape character assessments, described in **Chapter 4**, describe the development of Aston Rowant and Kingston Blount as nucleated settlements that emerged at the spring line at the foot of the Chiltern Hills where there was a good source of water supply. In landscape character terms, it is important to retain a sense of separation between the settlements to avoid erosion the characteristic of separate spring line villages.
- 6.5.2 Today the villages are separated by a relatively modest gap between the settlements. Land parcels 29 to 33 provide this sense of separation. When walking between the settlements on right of way number 115/7 the sense of leaving one village and entering the next is relatively brief. These land parcels play an essential role in retaining the physical and perceptual sense of separation between the settlements.
- 6.5.3 In addition, land parcels 31 and 32 have a sense of openness and a visual connection with the rising escarpment within the AONB. These land parcels have a been assessed as being potentially within the setting to the AONB and of medium/high landscape value. This has led to the assessment of a low capacity to accommodate change.

## 6.6 Land within the estate parklands: Land Parcels 12-16 and 44-60

- 6.6.1 The land parcels to the south of the existing settlement of Aston Rowant are part of a former estate parkland landscape associated with Aston House. This former land use remains readable on the ground in the presence of mature specimen trees, including both native and non-native species, standing within grazed meadows, the sinuous fish pond and wooded copses are also present in the landscape. From Aston Rowant Road, there are opportunities for views across the undulating landform towards the fish pond, with glimpsed views of the land parcels beyond. There are glimpsed views towards Kingston House from the highway called Kingston Hill.
- 6.6.2 The character of both Aston Rowant and Kingston Blount has been influenced by the presence of these estate parklands associated with current or former manor houses. This is reflected in the assessment of the landscape character sensitivity of these land parcels. These land parcels are assessed as being of low to medium/low capacity for small scale residential development.



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## **6.7 Land to the west of Aston Rowant: Land parcels 44-55**

- 6.7.1 These land parcels occupy a relatively expansive part of the study area and now accommodate a horse training centre and stud, amongst other uses. There appear to be some elements of the more historic landscape readable on the ground, primarily in the location of trackways and access roads and, to a lesser extent, the field patterns. The current land use has created its own distinctive landscape pattern with a strong rectilinear field pattern and other geometric forms, presumably associated with the primary purposes of the equine businesses. There are relatively few opportunities to appreciate the landscape character of these field parcels from the local rights of way and highways network, however there are views towards these field parcels, and particularly those field parcels to the west of the study area, from the Beacon Hill viewpoint within the AONB.
- 6.7.2 These land parcels are assessed as being of medium/low or low capacity for small scale residential development.

## **6.8 Conclusions**

- 6.8.1 Overall, this study has found the landscape within the study area to be sensitive to change due to the character of the landscape and settlements, the types of views available and the value of the landscape, recognised through landscape and heritage designations.
- 6.8.2 The Chilterns AONB, a statutorily protected landscape, lies at the southern boundary of the study area and its setting is likely to include parts of the study area. Both of the historic village cores are protected by conservation area status. Both villages have accommodated manor houses and associated estate parkland landscapes and there is a National Trail and recognised long distance walking routes within the study area. Following the methodology for the assessment of landscape sensitivity and capacity, these factors increase the sensitivity and value of the receiving environment and reduce capacity to accommodate change.
- 6.8.3 A number of land parcels have been identified as having a medium or medium low capacity to accommodate small scale residential development in landscape and visual terms. These land parcels are often smaller in size, able to accommodate small scale development without substantial mitigation planting, do not play a key role in views from sensitive visual receptors and integrate with the existing settlement pattern.

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- 6.8.4 Land parcel 8, the recreation ground to the north of Bakers Piece in Kingston Blount, has been assessed as being of medium sensitivity to change in terms of landscape character and visual sensitivity, however, this area is likely to be a valuable community asset and contribute towards the public open space need for the local community and therefore may be considered as unable to accommodate development based on criteria that are not considered within a landscape capacity study.
- 6.8.5 Given the sensitivity of the receiving environment within the study, should any future residential development be brought forward, it should accord with the design principles set out in the South Oxfordshire Design Guide<sup>10</sup> to respect existing built form layout and detailing and integrate into the distinctive landscape character of these settlements.

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<sup>10</sup> <http://www.southoxon.gov.uk/services-and-advice/planning-and-building/conservation-and-design/design/design-guide> [Accessed 05/12/18]



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# Appendix A

## **National Character Assessments for Upper Thames Clay Vales (No. 108) and the Chilterns (No. 110)**



## Introduction

As part of Natural England's responsibilities as set out in the Natural Environment White Paper,<sup>1</sup> Biodiversity 2020<sup>2</sup> and the European Landscape Convention,<sup>3</sup> we are revising profiles for England's 159 National Character Areas (NCAs). These are areas that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries, making them a good decision-making framework for the natural environment.

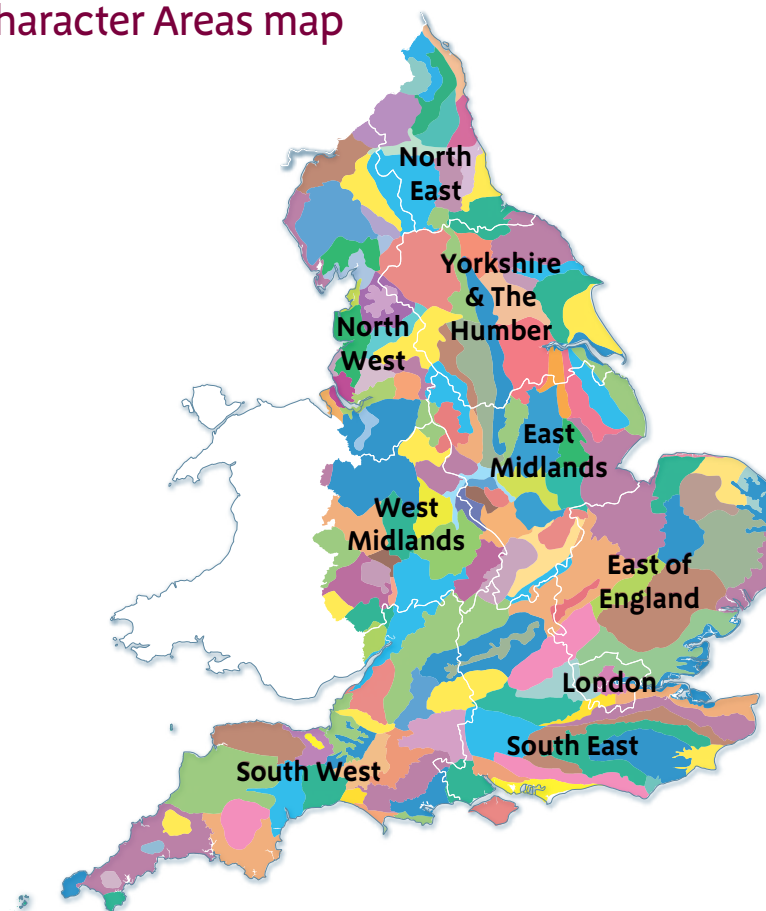
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and encourage broader partnership working through Local Nature Partnerships. The profiles will also help to inform choices about how land is managed and can change.

Each profile includes a description of the natural and cultural features that shape our landscapes, how the landscape has changed over time, the current key drivers for ongoing change, and a broad analysis of each area's characteristics and ecosystem services. Statements of Environmental Opportunity (SEOs) are suggested, which draw on this integrated information. The SEOs offer guidance on the critical issues, which could help to achieve sustainable growth and a more secure environmental future.

NCA profiles are working documents which draw on current evidence and knowledge. We will aim to refresh and update them periodically as new information becomes available to us.

We would like to hear how useful the NCA profiles are to you. You can contact the NCA team by emailing [ncaprofiles@naturalengland.org.uk](mailto:ncaprofiles@naturalengland.org.uk).

## National Character Areas map



<sup>1</sup> The Natural Choice: Securing the Value of Nature, Defra (2011; URL: [www.official-documents.gov.uk/document/cm80/8082/8082.pdf](http://www.official-documents.gov.uk/document/cm80/8082/8082.pdf))

<sup>2</sup> Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services, Defra (2011; URL: [www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-111111.pdf](http://www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-111111.pdf))

<sup>3</sup> European Landscape Convention, Council of Europe (2000; URL: <http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm>)

## Summary

The Upper Thames Clay Vales National Character Area (NCA) is a broad belt of open, gently undulating lowland farmland on predominantly Jurassic and Cretaceous clays. Blenheim Palace World Heritage Site falls within the NCA, along with around 5,000 ha of the North Wessex Downs Area of Outstanding Natural Beauty (AONB) and smaller areas of the Chilterns AONB and the Cotswolds AONB. Two of its Special Areas of Conservation (SAC) are designated for their lowland meadow vegetation communities, while Little Wittenham SAC has one of the most studied great crested newt populations in the UK. There are contrasting landscapes, including enclosed pastures of the claylands with wet valleys, mixed farming, hedges, hedge trees and field trees and more settled, open, arable lands. Mature field oaks give a parkland feel in many places.

The area encircles the Midvale Ridge NCA and covers an extensive area of low-lying land extending from Wiltshire and Gloucestershire to the west of Swindon through to Aylesbury in Buckinghamshire in the east. It comprises two separate sub-character areas: the Wiltshire, Oxfordshire and Buckinghamshire Vales to the north; and the Vales of White Horse and Aylesbury to the south. The area is dominated by watercourses, including the Thames and its tributaries, and there are also lakes associated with mineral extraction areas, such as the Cotswold Water Park. Watercourses and lakes provide important areas for wildlife and recreation. There are a number of major transport routes and patches of intensive industrial influence, including Didcot Power Station. There is little woodland cover (around 3 per cent) but hedgerows and mature field and hedgerow trees are a feature, and many watercourses are fringed with willow or poplar.

The area's internationally important lowland meadows require enhanced management alongside improved care of adjacent land, and its wetland habitats require appropriate hydrological regimes to be secured and an ecological network that is resilient to climate change. Wet grassland and wetland habitats also offer opportunities to manage floodwaters and improve water quality.

Potential growth of urban areas, particularly around Oxford and Swindon, may provide opportunities for creation of significant areas of accessible natural greenspace as part of comprehensive green infrastructure planning.

[Click map to enlarge; click again to reduce](#)

[Click map to enlarge; click again to reduce](#)



## Statements of Environmental Opportunities:

- **SEO 1:** Along the Thames and its tributaries, promote sustainable farming and best practice mineral working in order to conserve and restore semi-natural habitats, historic features, geodiversity, soil quality and soil carbon stores and also to regulate water flow in this area and downstream. Ensure conservation of Oxford Meadows Special Area of Conservation and North Meadow and Clattinger Farm Special Area of Conservation. Engage the public in river heritage and maintain traditional land management practices where appropriate.
- **SEO 2:** Manage farmland across the Upper Thames Clay Vales to produce food sustainably and to maintain sense of place. Taking a catchment approach, improve filtration of pollutants and regulation of water flow by realising a farmland habitat mosaic that incorporates strategic areas of wet grassland, reedbed, wet woodland and ponds as well as ditches and hedgerows.
- **SEO 3:** Ensure that heritage assets, especially characteristic features such as ridge and furrow, abandoned medieval villages, Roman roads, canals and historic parkland, including Blenheim Palace World Heritage Site, are maintained in good condition. Integrate conservation of these features with sustainable food production and provide public access to key examples. Seek opportunities to restore the wider historic setting of a feature, particularly in relation to the historic Royal Hunting Forests of Bernwood, Braydon and Wychwood.
- **SEO 4:** Realise sustainable development that contributes positively to sense of place and built heritage. Ensure adequate greenspace in association with all development and most importantly in growing settlements such as Aylesbury and Swindon. Create and manage greenspace to provide benefits for biodiversity, floodwater management, filtration of pollutants, tranquillity and recreation, and secure strategic access routes between town and country.



Rural and urban areas are at high risk of flooding. There are opportunities to slow and store water run-off across the NCA.

## Description

### Physical and functional links to other National Character Areas

The Upper Thames Clay Vales National Character Area (NCA) covers an extensive area of low-lying land extending from west of Swindon through to Aylesbury in the east, and completely encircles the Midvale Ridge NCA.

Around 3 per cent falls within North Wessex Downs Area of Outstanding Natural Beauty (AONB), with smaller areas falling within the Chilterns and Cotswolds AONBs. To the north, Wiltshire, Oxfordshire and Buckinghamshire Vales adjoin Cotswolds NCA, while the Vales of White Horse and Aylesbury border the Berkshire and Marlborough Downs and Chilterns NCAs to the south. Avon Vales is to the west; Bedfordshire and Cambridgeshire Claylands lies to the north-east.

The Oolitic Limestone of the Cotswolds is a significant aquifer and gives rise to the rivers that cross into the NCA, including the Windrush, the Churn, the Coln and the Thames itself. Farmoor Reservoir relies on the Cotswolds for 60 per cent of its water. Principal aquifers associated with chalk bedrock in the Chilterns and Berkshire Downs also extend a little into this NCA. Main surface water abstractions are for the public water supply. To the east, the majority serves London, while Farmoor Reservoir provides for Oxford, Banbury and Swindon in neighbouring NCAs. The catchments of the rivers Ock and Thame in the south and the tributaries in the north (including the Evenlode, Windrush, Leach, Cherwell and Colne) all drain south-west into the Thames.

The Chalk scarp of the Chilterns and the Berkshire and Marlborough Downs forms a backdrop for many views from the Vales to the south.

The area is crossed by many transport corridors, including the M40, M4, A419 (M4–M5 link), Oxford and Grand Union canals and railway lines linking to the Midlands, and to the north and west of England. Cycle routes such as National Cycle Route 45 and The Ridgeway and Thames Path National Trails also pass through the area.

### Distinct areas

- Wiltshire, Oxfordshire and Buckinghamshire Vales to the north and west of the Midvale Ridge
- Vales of White Horse and Aylesbury to the south of the Midvale Ridge



People enjoy the views of the Vales from the high ground of adjacent NCAs, including the escarpment of the North Wessex Downs Area of Outstanding Natural Beauty.

## Key characteristics

- Low-lying clay-based flood plains encircle the Midvale Ridge. Superficial deposits, including alluvium and gravel terraces, spread over 40 per cent of the area, creating gently undulating topography. The Upper Jurassic and Cretaceous clays and the wet valley bottoms give rise to enclosed pasture, contrasting with the more settled, open, arable lands of the gravel.
- The large river system of the River Thames drains the Vales, their headwaters flowing off the Cotswolds to the north or emitting from the springline along the Chilterns and Downs escarpments. Where mineral extraction takes place, pits naturally fill with water, and limestone gravels from the Cotswolds give rise to marl formation. There are a high number of nationally important geological sites.
- Woodland cover is low at only about 3 per cent, but hedges, hedgerow trees and field trees are frequent. Watercourses are often marked by lines of willows and, particularly in the Aylesbury Vale and Cotswold Water Park, native black poplar.
- Wet ground conditions and heavy clay soils discourage cultivation in many places, giving rise to livestock farming. Fields are regular and hedged, except near the Cotswolds, where there can be stone walls. The Vale of White Horse is made distinct by large arable fields, and there are relict orchards on the Greensand.
- In the river corridors, grazed pasture dominates, with limited areas of historic wetland habitats including wet woodland, fen, reedbed and flood meadow. There are two areas of flood meadow designated for their importance at a European level as Special Areas of Conservation (SAC). There are also rich and extensive ditch systems.
- Gravel extraction has left a legacy of geological exposures, numerous waterbodies and, at the Cotswold Water Park, a nationally important complex of marl lakes.
- Wetland habitat attracts regionally important numbers of birds including snipe, redshank, curlew and lapwing and wintering wildfowl such as pochard. Snake's head fritillary thrives in the internationally important meadows. The area also supports typical farmland wildlife such as brown hare, bats, barn owl, tree sparrow and skylark.
- Blenheim Palace World Heritage Site, including its Capability Brown landscape, is the finest of many examples of historic parkland in this NCA. There are many heritage features, including nationally important survivals of ridge and furrow, Roman roads, deserted medieval villages and historic bridges.
- Brick and tile from local clays, timber and thatch are traditional building materials across the area, combined with limestone near the Cotswolds and occasional clunch and wichert near the Chilterns.
- Settlement is sparse on flood plains, apart from at river crossings, where there can be large towns, such as Abingdon. Aylesbury and Bicester are major urban centres, and the outer suburbs of Oxford and Swindon spread into this NCA. Market towns and villages are strung along the springlines of the Chilterns and Downs. Major routes include mainline rail, canals, a network of roads including the M40 and M4 and The Ridgeway and Thames Path National Trails.

## Upper Thames Clay Vales today

The area is situated between the Chalk and limestone plateaux of the Cotswolds to the north and the Marlborough Downs, Berkshire Downs and Chilterns to the south and east. In the centre is the Midvale Ridge NCA, a low ridge of sandy Corallian Limestone. Either side of this ridge are river valley landscapes of flood plains, which form this NCA. Due to its size, and the different character of the Vales, this NCA has two distinct areas: Wiltshire, Oxfordshire and Buckinghamshire Vales to the north and west of the Midvale Ridge; and the Vales of the White Horse and Aylesbury to the south. The unifying feature is the Thames (or Isis) and its flood plains and tributaries.

The Wiltshire, Oxfordshire and Buckinghamshire Vales form part of a belt of clay lowland linking Cambridgeshire Claylands to the Avon Vales. This area consists of open, gently undulating lowland farmland bounded by the limestone scenery of the Cotswolds to the north and the narrow limestone outcrop of the Midvale Ridge to the south. It is underlain by an expanse of heavy blue-grey Oxford Clay and Kimmeridge Clay. In many places, the clay is covered locally by gravel deposits marked by extensive workings and flooded pits. The rivers Coln, Ray and Cherwell flow through the area, and the associated open flood plain landscapes consist of a regular and well-ordered field pattern, with willow pollards and reedbeds along the watercourses. Cotswold Water Park, a wetland area that includes the country's largest marl lake system, was created over the last 50 years by mineral extraction and lies to the west near Cricklade. Farmoor Reservoir lies to the west of Oxford, supplying much of the water for the surrounding areas.

The Vale of White Horse is a belt of heavy blue-grey Lower Cretaceous Gault Clay with exposures of underlying Jurassic Kimmeridge Clay, drained by the rivers Ock and Thame. South of Swindon, the Vale slopes down from the Berkshire and Marlborough Downs forming a clay plain, occasionally broken by minor hills of Greensand or Portland Limestone. Notable outliers of Chalk rise as hills near Dorchester and Cholsey. The area supports mainly arable farming with some pasture, producing a field pattern of large, regular fields with few hedgerows or trees. Villages such as Baulking and Goosey built around distinctive greens are located along the Ock Valley. Fruit orchards around Harwell thrive on light, fertile, sandy soils developed over the Greensand bench at the foot of the Chalk escarpment.



Otmoor is a large area of reedbed supporting a diversity of birds and other wildlife. Open water and semi-natural wetland habitats are characteristic of this area.



The Upper Thames drains the Vale to the west before cutting south at the confluence with the lower reaches of the Cherwell through the Midvale Ridge at Oxford. Wide expanses of terraced river gravels of limestone and wide alluvial flats dominate the Oxfordshire Vale. At the confluence of the Thames with the Windrush, Evenlode and Cherwell, distinctive hillocks form low, isolated features where patches of more ancient pebbly drift rest on the underlying Oxford Clay. Soils are generally yellowish brownearth, gleyed in lower-lying areas. West of Oxford, soils are dominantly calcareous with good drainage. The River Ray joins the Cherwell at Islip and drains the wide basin of Otmoor, where the soils are covered by a layer of peaty alluvium formed before the land was drained. The gently rising land along the northern rim to the east forms a watershed between the Ray and the Ouse.

The Vale of White Horse passes eastwards into the Aylesbury Vale. Here, the valley is dissected by alluvial flats and low river gravel terraces around the confluence of the Ock and the Thame. Farther east into the narrower Aylesbury Vale, sandy brownearths, developed from the ledge of Greensand below the Chalk scarp of the Chilterns, provide some of the most productive soils in the area. Aylesbury Vale is drained by the River Thame and numerous independent streams that flow south-west into the Thames. Where drainage is impeded, underlying waterlogged brown earths give rise to wet meadows. Predominantly an agricultural landscape, arable fields, dairy herds, hedges, hedgerow trees and field trees are frequent and characteristic. In places, mature field oaks give a parkland feel. The Chalk scarp of the Chilterns and the Berkshire and Marlborough Downs is prominent in many views from the Vales to the south.

In the north, the Wiltshire, Oxfordshire and Buckinghamshire Vales form a mainly pastoral landscape dominated by stock rearing, with some arable

and areas of old unimproved hay meadows north of Oxford. Wetter areas are usually under grass such as ley grassland and unimproved pasture or meadows. Larger arable fields tend to be restricted to the elevated gravel terraces with better drainage. Woodlands are generally scarce, although watercourses are often marked by lines of willows or native black poplar.

The Oxfordshire and Wiltshire Vales are characterised by 18th- and early 19th-century enclosure landscapes of small woods and thorn hedges. Former and current gravel workings along the Upper Thames flood plain are characteristic. Many are now open water and used for recreation. Rivers and watercourses, particularly where tree lined, are important landscape features – including the springlines, which emerge from the base of the Chalk escarpment.

Aylesbury Vale is a continuation of the Vale of White Horse's agricultural landscape, with a geometric enclosure of farms set among large hedged fields with regularly spaced hedgerow trees. Around villages the fields are generally smaller and more irregular. Black poplar tree stands are distinctive features. Bankside willows and flat, open watermeadows fringe the River Thame, which drains towards the Thames in the south-west.

Woodland was already scarce by the 11th century, and the NCA now has only 3 per cent woodland cover. Watercourses are often tree lined, and there are remnants of ancient Royal Hunting Forests and concentrations of orchards on the Greensand. However, nearly 2,000 ha of historic parkland and mature hedgerow trees can give an impression of a more wooded landscape. Important wetland habitats are associated with the waterbodies, watercourses and flood plains, including internationally designated calcareous flood meadows north of Oxford. Some river valley meadows and pastures are

regionally important for wading birds such as curlew and lapwing, including breeding populations and large wintering numbers. Nationally important numbers of breeding and wintering wildfowl are associated with the water-filled gravel pits and reservoirs. In addition, the area's arable habitats support nationally important assemblages of farmland birds.

A line of settlements developed along the natural springlines at the base of the Chilterns Chalk scarp. Today, they include historic and distinctive market towns. Parkland and fine houses are also notable features.

Brick-built buildings with tiled roofs reflect the widespread use of the local clay. The southern vales have many buildings plastered with 'wichert', a traditional chalky marl mixed with straw, and are often colour-washed. Villages on the ledge of Greensand were rarely built of the local sandstone. However, use of chalk blocks, or 'clunch', quarried from the chalk hills, with some thatch, adds variety. Settlement follows the rim of the northern vales, with villages on rising ground or raised gravel spreads within the flood-prone lowlands. Isolated 19th-century farmhouses are characteristic, and older stone-walled and stone-slatted buildings, particularly in the Oxford Vale, reflect the Cotswolds influence.

Although the NCA retains many tranquil spaces, the overwhelming impression is of an area criss-crossed by transport routes including motorways, major roads, canals and railway lines, dominated by Didcot Power Station and industrial activities around Abingdon in the south and Oxford Airport in the north, with the large towns of Swindon and Aylesbury to the west and east. Activity from military airbases such as Fairford and Brize Norton outside the NCA also impacts on the tranquillity of the area.



Snake's head fritillary grows in the historic meadows of North Meadow and Clattinger Farm SAC. Other characteristic species include brown hare, native black poplar and brown hairstreak butterfly.

## The landscape through time

The Upper Thames Clay Vales NCA is predominantly underlain by clay rocks deposited on ancient sea floors between 165 and 100 million years ago. The Oxford Clay and Kimmeridge Clay were deposited during the Jurassic Period, and contain fossils laid down in a marine environment. At the end of the Jurassic Period and the start of the Cretaceous Period, shallow marine estuarine conditions prevailed and sands and limestones of the Portland Group and Purbeck Limestone were laid down. The Cretaceous Period then saw the return of a marine environment in which more clay – the Gault Clay – was deposited, followed by the Upper Greensand and then the Chalk. More recent Quaternary ice-age events (over the last 2 million years) are represented by river terrace gravels, some of which have yielded rich fossil faunas of large mammals and molluscs.

There is widespread evidence of Neolithic settlement of the river terraces downstream from Radley, and ancient field systems are visible as cropmarks in the Thames gravels. Many of these settlements survive beneath Medieval market towns along the ancient route of the Lower Icknield Way; much of the prehistoric trackway runs along the Greensand ledge. There is significant prehistoric and Roman archaeology throughout the Upper Thames gravels. A network of Roman roads connected the frontier post of Dorchester with wider areas and acted as trade routes after the conquest. Roman farms were concentrated on the better draining loams of the gravel terraces along the river valleys, particularly the Thames. These are no longer visible, but routes of Roman roads such as the Ermine Way remain significant features in modern-day road patterns.

Most of the area's towns have significant time depth. There are Saxon remains, such as defences at Wallingford and Cricklade, and a concentration of Anglo-Saxon burial sites in the south of the area. Domesday survey showed the narrow belt of springline villages on the Greensand at the foot of the Chilterns in Aylesbury Vale as the most densely populated area. Significant archaeological features remain visible, including ancient field systems evident as cropmarks and remnant embankments and ditches associated with royal hunting grounds. Around Aylesbury, deserted villages such as Quarrendon, Fleet Marston and Creslow are also significant medieval features. Ridge and furrow survives across the area, with nationally important survivals at West Hanney, Denchworth, Lodgershall, Hogshaw and Creslow. Straight-sided large fields enclosing the northern Vales are typical of a 'planned countryside'. Domesday records little woodland cover, with scarcely any placenames relating to woodland.

The sparse settlement pattern within the Vales was more or less established by the 11th century, with the Upper Thames area generally more populated than the Vale to the east. Otmoor was, as now, largely devoid of any buildings or settlement and was used for summer and autumn grazing. Contrast existed between the pattern of pastures and hedgerows of the clays, pollarded willows on alluvium and the hedgeless arable fields and villages confined to gravel spreads within river valleys. Generally older, smaller fields surround riverine areas, while larger fields dominate higher, drier ground. Evidence of reclamation of the wetter lands exists in the occurrence of 'moor' placenames such as Otmoor. Otmoor was a wet, open landscape before enclosure, at which point it was divided up. Some of the earliest regional Parliamentary enclosures were in the Vale of White Horse, reaching a peak in the second half of the 18th century as new ideas of farm husbandry spread. Dairy farming developed

rapidly as new methods increased productivity from the rich clay soils. The still predominant field pattern of large hedged fields dates from this time. Historically most Buckinghamshire orchards were located in the south of the county around High Wycombe and south of Aylesbury, with cherry orchards the county's speciality. The Aylesbury prune, a black plum or damson, was widely grown and principally used for cooking and making jam.

Villages that were slow to develop have remained small and retained their early settlement layout and old buildings. Aylesbury is the only town of any size, growing partly from its trade in Aylesbury ducks as the breed was refined and popularised during the 18th century. The Thames and Severn Canal and the Oxford Canal, completed in 1789 and 1790 respectively, were important trade routes between London and the East Midlands, and the Wilts and Berks Canal linked the Thames at Abingdon to the Kennet and Avon Canal. The arrival of the railway in 1839 had a powerful impact and boosted other industries; for example, up to a ton (1,000 kg) of ducks a night were being shipped from Aylesbury to London by 1850. Swindon Railway Works opened in 1843 and transformed Swindon into a busy industrial town, employing over 12,000 people in its heyday in the early 20th century.

The introduction of hardier Peking ducks in 1873 eventually led to the decline of the duck-rearing industry, and the Aylesbury duck is now a rare breed. Changes in agriculture reduced the area's characteristic cherry, plum and apple orchards by over 90 per cent by 1994, and they continue to decline. The County Council's Survey of Orchards in Southern Buckinghamshire revealed a 39 per cent loss in orchards between 1975 and 1995 in one of the areas that was previously extremely important for fruit production. The condition of the remaining orchards is generally poor.

The switch from steam to electric in the 1950s, and later from rail to road transport, resulted in the decline and eventual closure of the Swindon Railway Works. Didcot Power Station was completed in 1968 and its infrastructure dominates the area south of Oxford. The original Didcot A was decommissioned in 2013, replaced by Didcot B, a gas-fuelled station on the same site. The area's motorways (M40 and M4) were built in the early 1970s, although the final section of the M40 north of Oxford was not completed until 1991, the route being altered to avoid Otmoor following local objections. During the late 20th century, the population of the area increased dramatically, partly because families moved out of the capital from the 1960s as part of the London overspill policy and also because commuters were attracted by the area's excellent rail and road links.

Pump drainage allowed wet land on Otmoor to be drained to enable arable farming from the 1960s. The Royal Society for the Protection of Birds (RSPB) bought the first of these fields in 1997 and began to return them to grassland. Some sand and gravel had been sourced from this area since Roman times but was only exploited on a large commercial scale during the 20th century. Mineral extraction on the Wiltshire/Gloucestershire border over the past 50 years has resulted in the formation of a series of wetlands, recognised as a country park, the Cotswold Water Park in 1967 and now managed for wildlife and recreation.

The population of Aylesbury had more than doubled by 2011, and this change is reflected across the area.

## Ecosystem services

The Upper Thames Clay Vales NCA provides a wide range of benefits to society. Each is derived from the attributes and processes (both natural and cultural features) within the area. These benefits are known collectively as 'ecosystem services'. The predominant services are summarised below. Further information on ecosystem services provided in the Upper Thames Clay Vales NCA is contained in the 'Analysis' section of this document.

### Provisioning services (food, fibre and water supply)

- **Food provision:** Around 75 per cent of the land in this NCA is farmed, with 16 per cent classed as Grade 1 or Grade 2 land. Around 50 per cent of farmed land is cultivated – mostly cereals and other arable crops, with some horticulture, including orchard fruit. The rest is grazed or uncropped; this land is mainly used for sheep, with some beef. It was formerly a major dairy farming area but dairy now accounts for only 6 per cent. Pig rearing remains significant, although numbers of pigs fell by nearly 45 per cent between 2000 and 2009.
- **Water availability:** There is no significant underlying aquifer, but aquifers associated with the Chalk bedrock in the Chilterns and the Berkshire Downs extend a little into this NCA; the Oolitic Limestone of the Cotswolds gives rise to many of the rivers in this NCA, including the Windrush, the Churn, the Coln and the Thames itself. Farmoor Reservoir relies on the Cotswolds for 60 per cent of its water. It draws most of its water from the Thames and contributes to the public water supply, particularly for Banbury (outside the NCA), Oxford and Swindon. Main abstractions are from rivers and are for public water

supply. To the east, the majority serves London. The NCA is classified as having 'no water available' for additional abstraction, with several areas that are over-licensed. A Restoring Sustainable Abstraction Programme has been put in place for sites that are adversely affected by abstractions (four sites within the Cherwell catchment).<sup>4</sup> Demands placed on the water supply will increase further with the significant identified growth of urban areas, with abstractions likely to be made up by water from outside the NCA.<sup>5</sup>

- **Genetic diversity:** The Aylesbury duck is now a rare breed, with only one pure-bred flock in the country, just outside the NCA. The Aylesbury prune, a historic Buckinghamshire plum widely grown throughout the county for centuries, is found in some hedgerows. Small numbers of Oxford Sandy and Black pigs are kept. Some of the ancient oak pollards of Blenheim Park may be direct lineal descendants of those recorded in Domesday.

There is an ongoing study of the clonal genetic diversity of black poplars in the Cotswold Water Park, along with an active propagation and conservation programme.

<sup>4</sup> Cherwell, Thame and Wye Catchment Abstraction Licensing Strategy, Environment Agency (December 2012; URL: <http://publications.environment-agency.gov.uk/pdf/GETHo7o5BJHS-E-E.pdf>)

<sup>5</sup> Kennet and Vale of the White Horse Catchment Abstraction Licensing Strategy, Environment Agency (December 2012; URL: <http://publications.environment-agency.gov.uk/pdf/GETHo3o6-E-E.pdf>)



## Regulating services (water purification, air quality maintenance and climate regulation)

- **Climate regulation:** Soil carbon content is generally slightly higher in the east of the NCA. Some of the loamy and clayey flood plain soils with naturally high groundwater (8 per cent) are peaty at depth or include small areas of peaty soils, and are likely to be associated with the large areas of wetlands (flood plain grazing marsh, fens and reedbeds); these form important stores of carbon, making their conservation a priority.
- **Regulating soil erosion:** Soils at risk of erosion cover 41 per cent of the NCA, including freely draining lime-rich loamy soils (16 per cent) and shallow lime-rich soils over chalk or limestone (8 per cent). These are at risk on sloping land where cultivated or bare soil is exposed (such as along footpaths and tracks or as a result of outdoor pig rearing in the case of the soils over chalk or limestone). This can be exacerbated where organic matter levels are low after continuous arable cultivation or where soils are compacted. Wind erosion is possible on some coarse-textured cultivated variants of the freely draining slightly acid loamy soils.
- **Regulating water quality:** Most of the rivers in the NCA are of good chemical quality, although a few are failing to achieve good chemical conditions. The ecological quality of the rivers is mixed: the River Thames/Isis and a few others are of bad quality in this NCA; a few are of good quality; but most are of moderate to poor quality. Causes of water pollution include channel modification and overshading, and point-source and diffuse agricultural pollution.<sup>6</sup>

<sup>6</sup> Water for Life and Livelihoods: River Basin Management Plan – South West River Basin District, Environment Agency (December 2009; URL: <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/southwest/Intro.aspx>)

- **Regulating water flow:** The risk of flooding is high throughout much of the NCA, as it forms the flood plain of many rivers, including the Thames. With large areas of undeveloped flood plain within this NCA, winter flooding is regular, and the flood plain provides a large area to store water, reducing risk within urban areas downstream. Nevertheless, settlements lying on the flood plain are susceptible to both river and surface water flooding. Generally the rivers flow in natural channels, but in areas around Oxford, Swindon and Aylesbury, urban growth has meant that many are modified, which has sometimes led to flash flooding.



Rivers, water-filled gravel pits and wetlands provide a range of ecosystem services. Water attracts wildlife and people and in this NCA where there is high flood risk, wetlands usefully hold water and intercept flow.

## Cultural services (inspiration, education and wellbeing)

- **Sense of history:** A sense of history is evident in the wealth of visible archaeological remains, which include Roman roads such as the Ermine Way, a prehistoric trackway running along the foot of the Chalk scarp, ancient field systems, deserted villages such as Quarrendon, pre-Christian burial sites to the south and remnant embankments and ditches associated with royal hunting grounds. There are also numerous country houses, parks and gardens, including Blenheim Palace, a designated World Heritage Site.
- **Recreation:** The NCA offers an extensive network of rights of way totalling 3,369 km at a density of nearly 2 km per km<sup>2</sup>, as well as open access land covering 400 ha, or just over 0.2 per cent of the NCA. In addition, 117 km of the Thames Path and 5 km of The Ridgeway National Trails cross through the area, while the Great Western Community Forest surrounding Swindon (covering 14 per cent of the NCA) is where new open spaces are being developed. Woodland grant schemes support public access to a significant proportion of the NCA's woodland. The Cotswold Water Park and other restored gravel workings such as in the Lower Windrush Valley offer significant opportunities for activities such as bird watching, walking and water-based recreation, and the River Thames/Isis is important for competitive rowing. The Oxford Canal Walk links with the Oxfordshire Way and is part of European long-distance path E2. The area has many geocache sites.<sup>7</sup>
- **Biodiversity:** Oxford Meadows SAC and North Meadow and Clattinger Farm SAC include vegetation communities that are possibly internationally unique, reflecting the influence of long-term grazing and hay-cutting on lowland hay meadows. Little Wittenham SAC is one of the most studied great crested newt sites in the UK. Within the NCA, 2,500 ha of land is designated as Sites of Special Scientific Interest (SSSI – 1.3 per cent of the NCA). This NCA has 7,000 ha of flood plain grazing marsh, 2,500 ha of woodland (wet woodland, lowland mixed deciduous and lowland beech and yew) and just over 1,000 ha of lowland meadows. There are also 600 ha of fens and 400 ha of reedbeds. The area's wetlands, including gravel pit restoration schemes, are important for breeding and overwintering birds, for example in the Lower Windrush Valley, Cotswold Water Park and Dorchester areas. Flood plain grazing marsh alongside the rivers Ray (including Otmoor), Cherwell and Thame support important breeding populations of waders (curlew, snipe, redshank and lapwing). The area is a national stronghold for brown and black hairstreak butterflies, associated with blackthorn, while arable habitats such as those in the Vale of White Horse, Upper Thames and Ray valleys support important numbers of farmland birds such as tree sparrow.
- **Geodiversity:** There are a high number of sites designated for their geological interest: 11 geological SSSI; and another 27 Local Geological Sites. Faringdon is home to the famous Faringdon Sponge Gravel, a Cretaceous unit filled with spectacular fossil sponges, other invertebrates, a few vertebrate bones and teeth, and wonderful examples of bioerosion. Wootton Bassett Mud Spring is a geological SSSI featuring oozing springs of cold, grey mud which blister up under a thin layer of vegetation. It is an example of a hydrogeological phenomenon represented by few other examples in Britain, the mechanism of which has been studied in detail at this site.

<sup>7</sup> Geocache sites: <http://www.geocaching.com/guide>



## Statements of Environmental Opportunity

**SEO 1: Along the Thames and its tributaries, promote sustainable farming and best practice mineral working in order to conserve and restore semi-natural habitats, historic features, geodiversity, soil quality and soil carbon stores and also to regulate water flow in this area and downstream. Ensure conservation of Oxford Meadows Special Area of Conservation and North Meadow and Clattinger Farm Special Area of Conservation. Engage the public in river heritage and maintain traditional land management practices where appropriate.**

**For example, by:**

- Making reference to the Water Framework Directive, catchment management plans, local Landscape Character Assessments and other strategy documents. Draw on best practice developed by initiatives such as the Catchment Sensitive Farming Programme, the Nature After Minerals Programme and the Payments for Ecosystem Services (PES) pilot developed in this National Character Area (NCA).
- Working across administrative and landownership boundaries to co-ordinate management along the length of watercourses and ditches. Co-ordination is relevant to ecological and physical processes, including the management of water levels. Restore and create habitats and corridors in order to improve resilience, ecosystem function and connectivity of the ecological network at a landscape scale.
- Where compatible with management of flood risk, continuing to restore or enhance as appropriate engineered watercourses to improve habitats, restore a more natural hydrological regime and re-connect watercourses with their flood plains.
- Identifying potential floodwater storage areas, including maximising opportunities around the restoration of mineral workings, and securing land uses that are flood compatible, including wet grassland.
- Considering and managing for climate change impacts on water levels.
- Identify those features that are sensitive to water level, including habitats, plant species and archaeology that are prone to drought or long-term submergence. Maintain and, where necessary, restore or create ditches and water level control structures.
- Managing improved and semi-natural grasslands and wetlands such as reedbed and wet woodland to slow run-off and filter pollutants. Also manage and create linear features such as hedgerows, ditches and grass strips to manage water flow and filter pollutants.
- Engaging communities in addressing sources of pollution and polluting practices in the rural and urban environment.
- Identifying areas of peat and deep soils that have higher carbon storage capacity. Manage these areas to minimise or avoid damage to soils, in some cases changing land use or restoring wetland habitat such as fen where appropriate.
- Conserving, restoring and creating wet grassland, reedbeds, ponds, species-rich ditches, lowland meadow and other semi-natural habitats. Focus creation and restoration around extending and linking existing areas of habitat in order to improve the function of ecological networks and secure management efficiencies.
- Identifying locations where arable farming is not sustainable in the

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long term and where arable reversion would increase benefits for biodiversity, regulation of water flow, regulation of water quality and conservation of soils. Support arable reversion by exploring and supporting markets for products of grasslands, including sustainable energy as developed in this area by the PES pilot.

- Where possible, making use of green hay and seeds from species-rich grasslands in the NCA to create and restore additional areas of species-rich grassland. Draw on best practice developed in the meadows in the Special Areas of Conservation and elsewhere to inform management of other meadows in the area.
- Providing suitable habitat for wildlife, particularly the area's characteristic species and rare species, including breeding waders. Tackle problems associated with non-native species such as crassula and mink.
- Conserving veteran trees, including pollarded willow and black poplar. Conserve suckering elm as vestiges of a tree that was once widespread in this area. Ensure that there are successors to veteran trees and guard against pests and diseases. Draw on best practice developed in Aylesbury Vale and Cotswold Water Park around black poplar.
- Managing and restoring active extraction sites to benefit geodiversity, biodiversity, recreation and all the water ecosystem services where possible.
- Creating habitats through restoration schemes for mineral workings in a way that contributes to a coherent and resilient ecological network. Where environmental conditions allow, seek to realise more complex or ambitious restoration options such as reedbed. Ensure that the long-term, sustainable management of habitats is secured along with recreational benefits engaging the public in learning about local geodiversity and biodiversity.
- Maintaining traditional management where this conserves distinctive landscape characteristics, biodiversity and cultural heritage, for

example lowland meadow and willow pollards. Engage the public in these traditions and associated heritage.

- Ensuring that recreation activities are appropriately managed across the NCA in order to avoid disturbance of breeding birds, poor experiences of tranquillity and potential conflict between user groups. Securing sustainable recreation is particularly important on ecologically fragile sites or where the negative impact would be significant.
- Conserving heritage assets along rivers, including Scheduled Monuments, historic buildings, bridges and historic watermeadows. Survey historic features and riverine landscapes to inform conservation and public engagement activities.
- Continuing to engage people in the cultural heritage of the Thames through events, interpretation and education. Secure an overview of the artistic and literary work associated with the Thames which contributes to sense of place.
- Engaging the public in the geodiversity of the River Thames, including fossils found in the river gravels. Ensure the conservation of such geodiversity, in particular geological Sites of Special Scientific Interest (SSSI), and facilitate public access where possible.
- Along key sections of the Thames Path National Trail and associated key rights of way, seeking to maximise accessibility and to engage the public in the natural and cultural heritage. Review accessibility and interpretation of the Thames tributaries and make improvements where there is greatest opportunity.
- Conserving tranquillity as appropriate along the rivers and promoting rivers and lakes as places in which to experience tranquillity. People living in areas of low tranquillity will be target audiences for promoting river and lake recreation.

**SEO 2: Manage farmland across the Upper Thames Clay Vales to produce food sustainably and maintain sense of place. Taking a catchment approach, improve filtration of pollutants and regulation of water flow by realising a farmland habitat mosaic that incorporates strategic areas of wet grassland, reedbed, wet woodland and ponds as well as ditches and hedgerows.**

**For example, by:**

- Making reference to the Water Framework Directive, catchment management plans, Area of Outstanding Natural Beauty (AONB) management plans, local Landscape Character Assessments and other strategy documents. Draw on best practice developed by initiatives such as the Catchment Sensitive Farming Programme, the Nature After Minerals Programme and the PES pilot developed in this NCA.
- Identifying locations prone to run-off, including access routes, sloping land and cultivated land, and seeking to impede run-off. Convert strategic areas of arable to grassland where possible.
- Adopting efficient chemical application methods such as precision farming. Where compatible with food production, encourage minimal use of chemicals and enhance biodiversity.
- Where arable reversion is sought in order to secure improved or alternative ecosystem services, exploring and supporting markets for products of grasslands, including sustainable energy as developed in this area by the PES pilot.
- Along watercourses, ditches and waterbodies, maintaining buffers to filter pollutants from run-off, which affects water quality and aquatic biodiversity. Create wet grassland, wet woodlands and reedbeds to filter pollutants and secure additional biodiversity benefits.
- Conserving soils to maximise filtration, thereby reducing rapid run-off and loss of soil. It is important to avoid compaction. Soil conservation will benefit plant growth and consequently food provision.
- Creating short- and long-term water storage to secure improved water availability but also to manage water flow so as to avoid flash flooding, for example, reservoirs can secure water supply at any scale over any period, including at the farm scale and ditches with control structures can be restored or created for managing water levels in a flood meadow or fen. Short-term floodwater storage applies to seasonally flooded grasslands and seasonal ponds and scrapes.
- Maintaining and enhancing the farmland habitat mosaic, restoring habitats such as fen, reedbed, wet grassland, ponds and wet woodland in historic locations where possible.
- Avoiding creation or expansion of woodland where there are benefits in retaining an open landscape, particularly in relation to breeding waders and valued views. Use tree stock of local provenance to guard against pests and diseases and conserve local species such as native black poplar and small leaved lime. Manage deer pressure.
- Providing and managing sufficient habitat for wildlife across farmland that is characteristic of this area, including brown hare, tree sparrow, curlew, otter, water vole, brown hairstreak butterfly, and barn owl.
- Providing nectar-rich habitats adjacent to insect-pollinated crops. Manage these habitats to support local biodiversity.
- Managing the farmland mosaic to regulate pests and diseases that affect food production and to support biodiversity. Achieve this by maximising heterogeneity of land use, providing habitat for natural predators and seeking genetic diversity. Incorporate features such as beetle banks and uncultivated field corners and strips into arable fields.

**SEO 3: Ensure that heritage assets, especially characteristic features such as ridge and furrow, abandoned medieval villages, Roman roads, canals and historic parkland, including Blenheim Palace World Heritage Site, are maintained in good condition. Integrate conservation of these features with sustainable food production and provide public access to key examples. Seek opportunities to restore the wider historic setting of a feature, particularly in relation to the historic Royal Hunting Forests of Bernwood, Braydon and Wychwood.**

**For example, by:**

- Using historic characterisation of the area's landscape and heritage features, improve understanding and management of historic features and their condition, significance and setting. Also draw on local Landscape Character Assessments and AONB management plans.
- Continuing to conserve and provide sustainable recreation in the Blenheim Palace World Heritage Site to maintain sense of history, sense of place and recreation interests. Assist the World Heritage Site Committee in delivering the Management Plan in support of the site's Outstanding Universal Value.
- Improving the condition of heritage assets and features, including those on the Heritage at Risk register, and locally characteristic features such as ridge and furrow through appropriate measures and seeking to reduce conflicting or unsympathetic management regimes, while recognising the high potential in this landscape for undiscovered remains.
- Working with land managers to identify how to conserve historic features while also producing food in a sustainable way. Avoid ploughing damage to heritage assets, ideally by reversion to grass. Grassed monuments in the landscape can also conserve soils, filter pollutants from run-off and increase the heterogeneity of land use for the benefit of biodiversity.
- Engaging local communities and visitors in the historic landscape through a high-quality public access network, interpretation and education involving examples of key historic features. Draw on best practice visitor engagement and management developed at Blenheim Palace World Heritage Site. Further enhance people's engagement with the heritage of canals.
- Working at the appropriate landscape scale to restore the setting of key features, including the historic Royal Hunting Forest landscapes of Bernwood, Braydon and Wychwood. Draw on work already carried out in these areas.
- Seeking to restore the mosaic of land uses (or habitats) of the ancient Royal Hunting Forests where this will maintain sustainable food provision and boost biodiversity, sense of history and recreation. Protect parkland trees from plough damage and manage deer pressure in order to support conservation and creation of woodland.
- Restoring Plantations on Ancient Woodland Sites, particularly in the ancient Royal Hunting Forest areas. Secure management of woodland by supporting markets for woodland products.
- Maintaining public access to woodlands within the historic boundaries of the ancient Royal Hunting Forests and improving the accessibility of key rights of way in the area.
- Managing canals to conserve important heritage features, maximising sustainable recreation opportunities and providing corridors and habitat for wildlife.

**SEO 4: Realise sustainable development that contributes positively to sense of place and built heritage. Ensure adequate greenspace in association with all development and most importantly in growing settlements such as Aylesbury and Swindon. Create and manage greenspace to provide benefits for biodiversity, floodwater management, filtration of pollutants, tranquillity and recreation, and secure strategic access routes between town and country.**

**For example, by:**

- Drawing on local Landscape Character Assessments, AONB management plans and historic landscape characterisation to define settlement pattern and local building materials and techniques.
- Ensuring that development outside urban and urban fringe settings is monitored and understood, as it is nationally significant in this NCA. Manage such development to avoid negative impacts – particularly impacts on the AONB, including their settings.
- Seeking to ensure that future development is designed to contribute positively to landscape character, focusing on local distinctiveness and being sensitive to setting. Ensure that design reflects an understanding of historic settlement pattern and traditional building materials and conserves significant heritage features. Reflect traditional building styles and incorporate traditional building materials into new development where possible. Identify the local sources of traditional building materials and establish sustainable extraction where possible. Conserve SSSI and Local Geological Sites through this work, including maintenance of access to exposures for research.
- Securing enhancements where possible, where existing development detracts from sense of place and other ecosystem services.
- Considering physical and functional links between settlements or development and the wider landscape, such as views and water flow. Manage the urban–rural fringe to contribute positively to landscape character.
- Incorporating new woodlands and tree screens into development as appropriate, taking care not to detract from the open landscape character of this NCA.
- Ensuring that there are green infrastructure links between town and country, providing access links for walkers, cyclists, less-able-bodied people and other user groups, particularly where greenspace is lacking and/or community health is poor.
- Managing canals in Aylesbury, Oxford and Swindon to provide sustainable recreation opportunities and habitat for wildlife. Integrating them into the wider network of access routes and green spaces and securing them as key corridors in the ecological network.
- Creating and managing green spaces so that they are accessible and tranquillity is maximised through for example, incorporating water features. Prioritise the creation and enhancement of greenspace where there is inadequate provision, for example in Aylesbury.
- Ensuring that development is water efficient and incorporates features such as sustainable urban drainage systems. Create and manage green spaces to store water, incorporating features such as seasonal ponds and reedbeds, which also have biodiversity interest and filter pollutants.
- Providing sufficient habitat in green spaces for local species, including nectar-rich habitat for pollinating insects. Manage these green spaces as part of an ecological network that links to gardens across a settlement.
- Engaging the public in settlement history, including guided walks to view historic buildings that use traditional building materials. Explore ideas with the public about how best to accommodate new development.

## Supporting document 1: Key facts and data

Upper Thames Clay Vales National  
Character Area (NCA): 189,000 ha

### 1. Landscape and nature conservation designations

3 per cent of the NCA is designated as an Area of Outstanding Natural Beauty (AONB). The Upper Thames Clay Vales NCA includes 2 per cent of the North Wessex Downs AONB, <1 per cent of the Chilterns AONB and <1 per cent of the Cotswolds AONB).

Management plans for the protected landscape can be found at:

- [www.chilternsaonb.org/](http://www.chilternsaonb.org/)
- [www.cotswoldsaonb.org.uk/](http://www.cotswoldsaonb.org.uk/)
- [www.northwessexdowns.org.uk/](http://www.northwessexdowns.org.uk/)

Source: Natural England (2011)

#### 1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Designated site(s)	Area (ha)	% of NCA
International	n/a	n/a	0	0
European	Special Protection Area (SPA)	n/a	0	0
	Special Area of Conservation (SAC)	Little Wittenham SAC, North Meadow and Clattinger Farm SAC, Oxford Meadows SAC	440	<1
National	National Nature Reserve (NNR)	Chimney Meadows NNR, North Meadow NNR	91	<1
National	Site of Special Scientific Interest (SSSI)	A total of 77 sites wholly or partly within the NCA	2,443	1

Source: Natural England (2011)

Please note: (i) Designated areas may overlap (ii) all figures are cut to Mean High Water Line, designations that span coastal areas/views below this line will not be included.

Land covered by international and European nature conservation designations totals 440 ha (<1 per cent of the total land area); national designations cover 2,443 (1 per cent). All the SAC and the NNRs lie within a SSSI designated area. There are 355 local sites in Upper Thames Clay Vales NCA covering 5,311 ha, which is 3 per cent of the NCA.

Source: Natural England (2011)

- Details of individual Sites of Special Scientific Interest can be searched at: <http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm>
- Details of Local Nature Reserves (LNR) can be searched at: [http://www.lnr.naturalengland.org.uk/Special/lnr/lnr\\_search.asp](http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp)
- Maps showing locations of Statutory sites can be found at: <http://magic.defra.gov.uk/website/magic/> – select 'Rural Designations Statutory'

#### 1.1.1 Condition of designated sites

Condition category	Area (ha)	% of SSSI land in category condition
Unfavourable declining	193	8
Favourable	1,262	52
Unfavourable no change	88	3
Unfavourable recovering	901	37

Source: Natural England (March 2011)

- Details of SSSI condition can be searched at: <http://www.sssi.naturalengland.org.uk/Special/sssi/reportIndex.cfm>



## 2. Landform, geology and soils

### 2.1 Elevation

Elevation ranges 39 m to 206 m, with a mean of 81 m. The height is provided by thick drift deposits or bedrock outcrops.

Source: Natural England (2010)

### 2.2 Landform and process

The Upper Thames Clay Vales are a low-lying and undulating clay vales landscape, contrasting with elevated landforms in bordering NCAs and with Midvale Ridge NCA in its midst. The NCA is the central section of a huge belt of low-lying land running through south central England from Somerset to Lincolnshire. Erosion and deposition by rivers sculpted drift during the Quaternary, determining the topography of deposits blanketing almost 40 per cent of the area. Particularly extensive terraces of river gravels can be found along the Thames, cataloguing the evolution of the river's course and down-cutting. Minor hills of thick superficial deposits and outcropping bedrock overlying the clay can be prominent, for example, Sinodun Hills near Dorchester, low ridge in the Vale of White Horse. Surface water features are prominent, with extensive river systems including a large proportion of the upper Thames catchment and numerous waterbodies resulting from mineral extraction. Natural river and flood plain function is today restricted due to several rivers being artificial or heavily modified (River Basin Management Plan: Thames Basin). The juxtaposition of chalk/limestone in neighbouring NCAs gives rise to springline watercourses and the largest marl lake system in Britain - Cotswold Water Park.

Source: Upper Thames Clay Vales Countryside Character Area Description, Thames and Avon Vales Natural Area Profile, River Basin Management Plan: Thames Basin, Environment Agency (2009)

### 2.3 Bedrock geology

Upper and Middle Jurassic clays (160 to 150 million years) of Oxford Clay and Kimmeridge Clay dominate the area and yield abundant fossils. The top of the Jurassic succession is found over the clay, south of the Midvale Ridge and west of Swindon, as low intermittent hills composed of limestones and sands of the Portland Group and the thin limestones of the Purbeck Limestone. Cretaceous (65 to 142 million years): Early Cretaceous rock was largely eroded away. The Whitchurch Sands are evidence of large rivers flowing across the area. Gault Clay floors the vale to the south of the Midvale Ridge, overlain in patches by Greensand and by a Greensand ledge protruding from beneath the Chilterns and Lambourn Downs.

Source: Natural England County Geology Profiles

### 2.4 Superficial deposits

Clay, silt, sands and gravels are present over almost 40 per cent of NCA as extensive river terraces and, around Oxford, alluvium spreads. Limestone gravels are found nearest to the Cotswolds. Rich ice-age mammal remains have been obtained.

Source: Upper Thames Clay Vales Countryside Character Area Description, Thames and Avon Vales Natural Area Profile

### 2.5 Designated geological sites

Designation	Number
Geological Site of Special Scientific Interest (SSSI)	11
Mixed interest SSSI	0

There are 27 Local Geological Sites within the NCA.

Source: Natural England 2011

- Details of individual Sites of Special Scientific Interest can be searched at: <http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm>

## 2.6 Soils and Agricultural Land Classification

Largely mixed and pastoral farming, with poorly drained heavy clay soils largely under grass, while arable fields are restricted to the better drained soils on the gravel terraces. Soils are gleyed in lower lying areas. Some of the most productive soils are sandy brownearths in Aylesbury Vale, developed from the ledge of Greensand below the Chalk scarp of the Chilterns. In the Vale of White Horse, orchards grow on this ledge. At Otmoor the soils are covered by a layer of peaty alluvium.

**Source: Upper Thames Clay Vales Countryside Character Area Description, Thames and Avon Vales Natural Area Profile**

The main grades of agricultural land in the NCA are broken down as follows (as a proportion of total land area):

Agricultural Land Classification	Area (ha)	% of NCA
Grade 1	1,399	1
Grade 2	29,412	16
Grade 3	85,221	45
Grade 4	61,686	33
Grade 5	983	1
Non-agricultural	3,477	2
Urban	6,822	4

**Source: Natural England (2010)**

- Maps showing locations of statutory sites can be found at:  
<http://magic.defra.gov.uk/website/magic/> - Select 'Landscape' (shows ALC and 27 types of soils)



Mineral extraction and water-filled pits are concentrated in the Cotswold Water Park and Lower Windrush Valley. Restoration schemes will shape the landscape in the longer term.

### 3. Key water bodies and catchments

#### 3.1 Major rivers/canals

The following major rivers/canals (by length) have been identified in this NCA.

Name	Length in NCA (km)
River Thames or Isis	77
River Thame	45
River Thames	31
River Ock	30
River Ray	23
River Windrush	22
River Cherwell	21
Oxford Canal	14
River Evenlode	10
River Leach	6
River Churn	5
River Avon	4
Grand Union Canal	4
River Glyme	2
Clifton Cut	1
River Coln	1

Source: Natural England (2010)

Please note: other significant rivers (by volume) may also occur. These are not listed where the length within the NCA is short.

The Upper Thames catchment dominates, with the northern tip falling into the River Great Ouse (East Anglian) catchment and the southern tip into the River Avon (Bristol) catchment.

The Thames and its numerous tributaries drain the land north of the Midvale Ridge NCA before a final confluence at Oxford where the Thames passes through the ridge to meet the Thame and Ock to the south of the ridge.

The NCA includes parts of two canal systems: the Oxford and the Grand Union. Other canals formerly linked Abingdon to Melksham and Lechlade to Stroud.

There are substantial areas of water-filled gravel pits near Witney, Lechlade and Cricklade.

#### 3.2 Water quality

The total area of Nitrate Vulnerable Zone is 189,000 ha, 100 per cent of the NCA.

Source: Natural England (2010)

#### 3.3 Water Framework Directive

Maps are available from the Environment Agency showing current and projected future status of water bodies at: [http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e)

## 4. Trees and woodlands

### 4.1 Total woodland cover

The NCA contains 10,141 ha of woodland (5 per cent of the total area), of which 2,501 ha is ancient woodland. The Great Western Community Forest, one of twelve Community Forests established to demonstrate the contribution of environmental improvement to economic and social regeneration, covers 26,478 ha of this NCA, which is 14 per cent.

Source: Natural England (2010), Forestry Commission (2011)

### 4.2 Distribution and size of woodland and trees in the landscape

Woodlands are small, scattered and predominantly on higher ground. Wet woodland notably absent in the floodplains. Concentrations are remnants of ancient royal hunting forests (from north to south: Bernwood around Brill, Wychwood east of Witney and Braydon near Swindon). The Great Western Community Forest is not particularly wooded. There are notable concentrations of orchards on the Greensand. Willow pollards are distinctive of floodplains and also black poplar in Aylesbury Vale. South of the Midvale Ridge, mature field oaks are characteristic.

Source: Upper Thames Clay Vales Countryside Character Area Description, Thames and Avon Vales Natural Area Profile

### 4.3 Woodland types

A statistical breakdown of the area and type of woodland found across the NCA is detailed in the following table.

Area and proportion of different woodland types in the NCA (over 2 ha).

Woodland type	Area (ha)	% of NCA
Broadleaved	7,278	4
Coniferous	1,169	1
Mixed	497	<1
Other	1,197	1

Source: Forestry Commission (2011)

Area and proportion of Ancient Woodland and Planted Ancient Woodland within the NCA:

Type	Area (ha)	% of NCA
Ancient semi-natural woodland	1,492	1
Ancient re-planted woodland (PAWS)	1,009	<1

Source: Natural England (2004)



Bluebells at Pinsley Wood.



## 5. Boundary features and patterns

### 5.1 Boundary features

In this farmed landscape, boundaries are significant features. There are limited hedgerows to the south of the Midvale Ridge, particularly in the arable areas of the Vale of White Horse. Hedgerows are largely blackthorn and hawthorn, with elm sometimes as a shrub component. Hedgerow trees are frequent in Buckinghamshire. Ditches and waterside vegetation such as reedbed provide boundaries in wetter areas north of the Midvale Ridge. Willow pollards are common in boundaries, especially along watercourses, across the wetter areas of the NCA. Dry stone walls are found north of the Midvale Ridge.

**Source:** Upper Thames Clay Vales Countryside Character Area Description; Countryside Quality Counts (2003)

### 5.2 Field patterns

Resulting from parliamentary enclosure, a regular and well-ordered field pattern dominates. Less enclosed landscapes can be found in the floodplains. Smaller and irregular fields are limited to riverside and village localities and particularly to Otmoor. Larger fields are on the higher, drier ground.

**Source:** Upper Thames Clay Vales Countryside Character Area description; Countryside Quality Counts (2003)



The regular field pattern dates back to Parliamentary enclosure. There are nationally important areas of ridge and furrow and frequent hedgerow trees in Buckinghamshire, as shown here.

## 6. Agriculture

The following data has been taken from the Agricultural Census linked to this NCA.

### 6.1 Farm type

In 2009, the predominate farm types were grazing livestock (especially sheep) and cereals, but the area also supported a range of other farm types: 430 grazing livestock lowland (27 per cent), 401 cereals (25 per cent), 101 mixed (6 per cent), 97 dairy (6 per cent), 42 specialist poultry (3 per cent), 39 horticulture (2 per cent), 26 general cropping (2 per cent) and 16 specialist pigs (1 per cent). Several farm types had decreased in holdings between 2000 and 2009, including dairy, mixed farming, grazing livestock, cereals and horticulture. Dairy farming lost the most proportionately (46 per cent) as well as the most holdings (84) followed by mixed farming which was down by 38 per cent or 62 holdings. Other types, specialist poultry, general cropping and specialist pigs all saw an increase in numbers of holdings, the largest being in other types with 77 holdings.

Source: Agricultural Census, Defra (2010)

### 6.2 Farm size

In 2009, farms over 100 ha were the most common with 416 holdings (26 per cent), followed by farms sized between 5 ha and 20 ha with 397 holdings (25 per cent). The numbers of holdings in all size brackets fell quite steeply between 2000 and 2009, apart from those between 20 and 50 ha. The largest fall was in farms between 5 and 20 ha which fell by 40 holdings, followed by farms over 100 ha which fell by 38 holdings. Farms between 20 and 50 ha rose by 13 holdings.

Source: Agricultural Census, Defra (2010)

### 6.3 Farm ownership

Owned land made up 68 per cent of total farm area in 2009, while the remainder is tenanted. There was a decrease in both owned land (1 per cent) and land held in tenancy (8 per cent) over the 2000 to 2009 period.

2009: Total farm area = 137,837 ha; owned land = 94,355 ha

2000: Total farm area = 143,157 ha; owned land = 95,248 ha

Source: Agricultural Census, Defra (2010)



Sheep grazing by the Thames near Farmoor Reservoir.



## 6.4 Land use

Grass and uncropped land had the highest land use cover (69,475 ha covering 50 per cent of the farmed area), followed by cereals (42,063 ha covering 31 per cent of the farmed area). Between 2000 and 2009 the area of land use decreased for most farm types with the largest decrease by area being in cereals by 7,719 ha or 16 per cent. However, there was a dramatic rise in other arable crops by 2,040 ha. Oil seeds also increased by 851 ha over this period.

Source: Agricultural Census, Defra (2010)

## 6.5 Livestock numbers

Sheep were by far the most numerous livestock (121,100), followed by cattle (80,700) then pigs (24,500). There was a decline in the numbers of all livestock between 2000 and 2009, with pigs decreasing by 44,800 (65 per cent), sheep by 54,200 (31 per cent) and cattle by 14,400 (15 per cent).

Source: Agricultural Census, Defra (2010)

## 6.6 Farm labour

The great majority of holdings were run by owner farmers (2,111) as compared to salaried managers (125). There are more full-time workers (496) than part-time workers (321), with fewer still casual/gang workers (224). Trends from 2000 to 2009 were a decrease across all job types, with the number of principal farmers down by 291 and salaried managers by 8. The number of full-time workers had decreased by 282 as had the number of part-time workers by 55 and casual/gang workers had decreased by 73.

Source: Agricultural Census, Defra (2010)

Please note: (i) Some of the Census data is estimated by Defra so will not be accurate for every holding (ii) Data refers to Commercial Holdings only (iii) Data includes land outside of the NCA belonging to holdings whose centre point is within the NCA listed.



Field pattern in the Didcot area.

## 7. Key habitats and species

### 7.1 Habitat distribution/coverage

The total area of recognised semi-natural habitat is under 10 per cent of NCA (excludes watercourses and waterbodies). Around the northern tip from Winslow south to Watlington, there is almost no semi-natural habitat. Clusters of varied semi-natural habitats exist north of Oxford, around the Cotswold Water Park, around the River Ray including Otmoor and along the border with the Berkshire Downs in the south.

The predominance of flood plain grassland is associated with the river courses. Grasslands are small and isolated, except along the Thames where there are occasional clusters from north Oxford upstream to Cricklade. The upper River Ray catchment, including Otmoor, also has concentrated grassland interest.

Strongholds for a very distinctive calcareous flood meadow grassland type are found in north Oxford and at Clattinger Farm and North Meadow. Characteristic species include adder's-tongue fern, meadow rue, snake's head fritillary and greater burnet.

Some river valley meadows and pastures are regionally important for wading birds, including small breeding numbers of lapwing, snipe, curlew and redshank, and large wintering numbers of lapwing and golden plover. Nationally important numbers of breeding and wintering wildfowl are associated with water-filled gravel pits and reservoirs.

Mineral extraction has created significant wetland habitat in the river valleys, including marl lakes which are nationally scarce and including the Cotswold Water Park as the most extensive marl lake system in Britain.

Ponds are commonly found in grazed fields. The nature conservation value of the river, canal and ditch systems is restricted to a good diversity of coarse and salmonid fishes including brook lamprey and bullhead and some rich and extensive ditch systems around Otmoor, the upper River Ray, the River Thames near Wallingford and in the lower Windrush Valley. Wet woodland is notably absent. The ancient hunting forest areas of Bernwood and Braydon provide the two concentrations of woodland habitat parcels. Small-leaved lime is characteristic in some parts of Braydon. Boundaries in the farmed landscape are important including hedgerows and, north of Oxford, mud-capped stone walls supporting moss flora. Nationally significant populations of black hairstreak butterfly and native black poplar occur in Aylesbury Vale.

In addition, the NCA contains important arable habitats. These support nationally important assemblages of arable birds.

**Source: Thames and Avon Vales Natural Area Profile Natural Area Profile (Natural England 2011)**

## 7.2 Priority habitats

The Government's new strategy for biodiversity in England, Biodiversity 2020, replaces the previous Biodiversity Action Plan (BAP) led approach. Priority habitats and species are identified in Biodiversity 2020, but references to BAP priority habitats and species, and previous national targets have been removed. Biodiversity Action Plans remain a useful source of guidance and information. More information about Biodiversity 2020 can be found at; <http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/englandsbiodiversitystrategy2011.aspx>

The NCA contains the following areas of mapped priority habitats (as mapped by National Inventories). Footnotes denote local/expert interpretation. This will be used to inform future national inventory updates.

Priority habitat	Area (ha)	% of NCA
Coastal and flood plain grazing marsh	6,467	3
Broadleaved mixed and yew woodland (broad habitat)	3,338	2
Lowland meadows	1,265	1
Reedbeds	68	<1
Lowland calcareous grassland	38	<1
Fens	29	<1
Purple moor grass and rush pasture	16	<1
Lowland dry acid grassland	1	<1

Source: Natural England (2011)

Maps showing locations of priority habitats are available at

- <http://magic.defra.gov.uk/website/magic/> select 'Habitat Inventories'

## 7.3 Key species and assemblages of species

- Maps showing locations of priority habitats are available at: <http://magic.defra.gov.uk/website/magic/>
- Maps showing locations of S41 species are available at: <http://data.nbn.org.uk/>



Wet meadows support breeding curlew, making this area one of only two lowland breeding areas in England. There are also nationally important numbers of wintering wildfowl.

## 8. Settlement and development patterns

### 8.1 Settlement pattern

Springline settlements at the foot of the Chalk scarps on the southern boundary are characteristic and include historic and distinctive market towns. Elsewhere, flood risk has dictated settlement patterns so that valley bottoms are uninhabited except at river crossing points. Nucleated settlements are found on rising ground or raised gravel spreads above the rivers. In the wider landscape, settlement is isolated farmsteads dating back to parliamentary enclosure and country estates. Oxford, Dorchester, Abingdon and Wallingford are Thames crossing points. Dorchester's modern day road network reflects Roman routes. Some villages have retained their early settlement layout and old buildings. To the south of the Midvale Ridge, villages on the gravels often surround distinctive greens. Otmoor remains devoid of settlement and is fringed by linear development of distinctive villages. Aylesbury is a growing large town and there is marked expansion of smaller settlements including Carterton, Witney and Faringdon, Bicester, Didcot, Abingdon and Benson. Development around Oxford and Swindon enters this NCA.

**Source:** Upper Thames Clay Vales Countryside Character Area Description; Countryside Quality Counts (2003)

### 8.2 Main settlements

The main settlements within the NCA are Swindon, Aylesbury, Abingdon, Bicester, Witney, Didcot, Kiddlington, Carterton, Thame and Wootton Bassett. The total estimated population for this NCA (derived from ONS 2001 census data) is 563,220.

**Source:** Upper Thames Clay Vales Countryside Character Area Description; Countryside Quality Counts (2003), Natural England (2012)

### 8.3 Local vernacular and building materials

To the north of the Midvale Ridge, local clay allowed construction of brick-built buildings and pan tiled roofs. There is a moderate occurrence of cruck buildings. Stone was sourced from the Cotswolds to the north and from the chalk hills to the south. Cotswold stone walls and slates are particularly evident in the Oxford Vale, whilst chalk blocks or 'clunch' have limited use near the Chilterns. To the south of the Midvale Ridge, traditional construction used 'wichert', a chalky marl mixed with straw or earth, to plaster walls which were then often colour-washed. Haddenham and Cuddington are examples. Timber-framing and brick are typical building materials. Straw thatch for roofing is also characteristic. Villages located on the broad ledge of Greensand below the Chilterns were rarely built of the local sandstone.

**Source:** Upper Thames Countryside Character Area description; Countryside Quality Counts (2003), Draft Historic Profile



Historic settlements are located at river crossings, such as at Wallingford on the Thames. People today enjoy riverside green spaces and the Thames Path National Trail.



## 9. Key historic sites and features

### 9.1 Origin of historic features

Neolithic tribes colonised the river terraces downstream from Radley and ancient field systems are visible as cropmarks in the Thames gravels. Virtually no Palaeolithic or Mesolithic remains exist due to the difficulty of cultivating the heavy clay soils before the advent of crude tools. The Lower Icknield Way is a prehistoric trackway along the Greensand ledge on the southern boundary.

Numerous settlements on gravel spreads date from the prehistoric through to the Roman and Saxon periods as evidenced by visible archaeological features, for example, Wallingford Saxon defences.

Royal hunting grounds first created in Saxon times are evidenced by embankments, ditches and ancient semi-natural woodland, for example, Bernwood and Braydon. Anglo-Saxons have also created pagan burial sites in the south of the area.

The area is crossed by several major Roman roads, such as Ermine Way. Ridge and furrow dating back to medieval times survives across the area, with nationally important survivals at West Hanney, Denchworth, Lodgershall, Hogshaw and Creslow. Around Aylesbury the deserted villages, such as Quarrendon, Fleet Marston and Creslow, are significant historic landscape features from medieval times.

Predominant field pattern and isolated farmsteads date from the parliamentary enclosures of the 18th and 19th centuries. Some of the earliest enclosures were in the Vale of the White Horse and there was a peak in the late 18th century. There is a medium-high concentration of pre-1750 farmstead buildings.

Source: Countryside Quality Counts, Draft Historic Profile, Upper Thames Clay Vales  
Countryside Character Area Description

### 9.2 Designated historic assets

This NCA has the following historic designations:

- 38 Registered Parks and Gardens covering 1,849 ha.
- 1 Registered Battlefield covering 95 ha.
- 245 Scheduled Monuments.
- 8,422 Listed Buildings.

Source: Natural England (2010)

- More information is available at the following address:  
[www.english-heritage.org.uk/caring/heritage-at-risk/](http://www.english-heritage.org.uk/caring/heritage-at-risk/)
- [www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/](http://www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/)



In the floodplains, settlement has long been focused at river crossing points, as illustrated by the castle remains at Wallingford beside the Thames.



## 10. Recreation and access

### 10.1 Public access

- 1 per cent of the NCA 2,785 ha is classified as being publically accessible.
- There are 3,369 km of public rights of way at a density of 1.8 km per km<sup>2</sup>.
- There are 2 National Trails (The Ridgeway and the Thames Path) covering 5 km and 116 km within the NCA respectively.

Source: Natural England (2010)

The following table shows the breakdown of land which is publically accessible in perpetuity:

Access designation	Area (ha)	% of NCA
National Trust (accessible all year)	20	<1
Common Land	318	<1
Country Parks	43	<1
CROW Access Land (Section 4 and 16)	827	<1
CROW Section 15	219	<1
Village Greens	112	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	397	<1
Local Nature Reserves (LNR)	67	<1
Millennium Greens	7	<1
Accessible National Nature Reserves (NNR)	91	<1
Agri-environment Scheme Access	125	<1
Woods for People	1,844	1

Sources: Natural England (2011)

Please note: Common Land refers to land included in the 1965 commons register; CROW = Countryside and Rights of Way Act 2000; OC and RCL = Open Country and Registered Common Land.



Thames Path National Trail.

## 11. Experiential qualities

### 11.1 Tranquillity

Based on the CPRE map of tranquillity (2006) the NCA is undisturbed away from the main towns (Abingdon, Aylesbury, Didcot, Swindon) and transport links (Oxford airport, the M4 and M40). The greatest areas of tranquillity are to the far west (around and to the south of the Cotswold Water Park) and east (Aylesbury Vale) of the NCA.



Nature after minerals - Rushy Common Nature Reserve on former sand and gravel workings in the lower Windrush Valley.

A breakdown of tranquillity values for this NCA are detailed in the table below:

Category of tranquillity	Score
Highest	48
Lowest	-84
Mean	-<1

Sources: CPRE (2006)

- More information is available at the following address: [www.cpre.org.uk/what-we-do/countryside/tranquil-places/in-depth/item/1688-how-we-mapped-tranquillity](http://www.cpre.org.uk/what-we-do/countryside/tranquil-places/in-depth/item/1688-how-we-mapped-tranquillity)

### 11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. A breakdown of intrusion values for this NCA is detailed in the following table.

Intrusion category	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	26	47	57	31
Undisturbed	71	50	37	-35
Urban	3	3	7	4

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are the huge increase in disturbance.

- More information is available at the following address: [www.cpre.org.uk/resources/countryside/tranquil-places](http://www.cpre.org.uk/resources/countryside/tranquil-places)

## 12. Data sources

- British Geological Survey (2006)
- Natural Area Profiles, Natural England (published by English Nature 1993-1998 )
- Countryside Character Descriptions, Natural England (regional volumes published by Countryside Commission/Countryside Agency 1998/1999)
- Joint Character Area GIS boundaries, Natural England (data created 2001)
- National Parks and AONBs GIS boundaries, Natural England (2006)
- Heritage Coast Boundaries, Natural England (2006)
- Agricultural Census June Survey, Defra (2000,2009)
- National Forest Inventory, Forestry Commission (2011)
- Countryside Quality Counts Draft Historic Profiles, English Heritage (2004)\*
- Ancient Woodland Inventory, Natural England (2003)
- Priority Habitats GIS data, Natural England (March 2011)
- Special Areas of Conservation data, Natural England (data accessed in March 2011)
- Special Protection Areas data, Natural England (data accessed in March 2011)
- Ramsar sites data, Natural England (data accessed in March 2011)
- Sites of Special Scientific Interest, Natural England (data accessed in March 2011)
- Detailed River Network, Environment Agency (2008)
- Source protection zones, Environment Agency (2005)
- Registered Common Land GIS data, Natural England (2004)
- Open Country GIS data, Natural England (2004)
- Public Rights of Way Density, Defra (2011)
- National Trails, Natural England (2006)
- National Tranquillity Mapping data, CPRE (2007)
- Intrusion map data, CPRE (2007)
- Registered Battlefields, English Heritage (2005)
- Record of Scheduled Monuments, English Heritage (2006)
- Registered Parks and Gardens, English Heritage (2006)
- World Heritage Sites, English Heritage (2006)
- Incorporates Historic Landscape Characterisation and work for preliminary Historic Farmstead Character Statements (English Heritage/Countryside Agency 2006)

Please note all figures contained within the report have been rounded to the nearest unit. For this reason proportion figures will not (in all) cases add up to 100 per cent. The convention <1 has been used to denote values less than a whole unit.



## Supporting document 2: Landscape change

### Recent changes and trends

#### Trees and woodlands

- There is evidence of an increase in the area covered by woodland grant schemes between 1999 and 2003, from 13 to 22 per cent and an equivalent increase from 15 to 27 per cent on ancient woodland sites, which suggests a slight recent improvement.
- Designation of the Great Western Community Forest, in the most sparsely wooded area, covers 14 per cent of the NCA. New woods have been planted in this area. However beyond this a limited area of new woodland has been planted, including woodlands near Eynsham and Kidlington and wet woodland beside the Thames near Dorchester.
- A continuing decline in the extent of coppice management, the consequence of poorly managed small woodlands, along with the sustained impact of a large deer population, continues to depress the biodiversity value of woodlands, particularly for butterflies like some fritillary species that were once common.
- Non-native poplar plantations have changed the open character of many riverside landscapes.
- Pollarded riverside willows, and native black poplars in the Aylesbury Vale and Cotswold Water Park, are aging and there are few successors. Willows

collapse can be seen into watercourses and onto access routes including the Thames Path.

#### Boundary features

- Between 2003 and 2011 the length of boundary features maintained under stewardship agreements increased from 542 km (4 per cent) to 2,177 km (16 per cent), suggesting that the condition of boundaries will be improving in some areas.



Hedgerows and margins across farmland provide habitat for wildlife and intercept surface water run-off. Hedges and hedgerow trees also contribute to sense of place.

## Agriculture

- The mix of farm types has stabilised after post Second World War expansion of arable farming, so the mosaic character of the geometric field pattern, with grass land and arable juxtaposed, remains largely intact.
- Stewardship agreements supporting agricultural activities that maintain semi-natural neutral pasture and lowland hay meadows continue to increase marginally.
- There has been removal of old field barns and conversion of many to housing.



Traditional building materials include brick, tile, timber and thatch. In addition, limestone is found near the Cotswolds and occasional clunch and wichert near the Chilterns.

## Settlement and development

- The area is ranked eighth nationally in terms of its share of development outside urban or urban fringe areas. These pressures continue with significant planned expansion north of Oxford and Aylesbury, market towns like Bicester, Didcot and Abingdon, and the Southern Development Area of Swindon, all having an impact on landscape character.
- Many rural villages are also experiencing significant expansion.
- The visual and noise impact of the M40 is increasing, while other major roads are being upgraded.

## Semi-natural habitat

- In addition to around 52 per cent of SSSI area being in 'favourable' condition, the condition of semi-natural habitat in an additional 40 per cent of SSSI area is in 'unfavourable recovering' condition. This includes the large Wytham Woods SSSI where a woodland grant scheme is supporting management activities in order to improve condition. Nationally significant areas of lowland meadow continue to be maintained under agri-environment scheme agreements.
- Over the past ten years, landscape-scale conservation work has targeted the tributaries of the Upper Thames. This has involved creation of permanent and seasonal ponds, restoration and creation of lowland meadow and habitat management for wildlife such as lapwing, curlew, water vole, otter and brown hare.<sup>8</sup>

<sup>8</sup> BBOWT's Recovery Plan for Nature: Living Landscapes for All, Berkshire, Buckinghamshire and Oxfordshire Wildlife Trusts (undated)



- As indicated by SSSI assessments, deer continue to negatively impact woodland habitat and semi-natural grassland habitats are deteriorating due to inappropriate grazing regimes.
- Around 5 per cent of SSSI area in the NCA is in 'unfavourable declining' condition. For example, poor water quality and non-native species are negatively impacting the Cotswold Water Park SSSI. Just under 5 per cent of SSSI area is in neither improving nor declining condition, being assessed as 'unfavourable no change'.

## Historic features

- Of the remaining historic parkland in the area, 43 per cent is covered by a Historic Parkland Grant and a further 20 per cent is in stewardship



Oxford Canal at Thrupp.

agreements. This suggests that the quality of this feature, as part of the landscape character, is being maintained.

- 67 per cent of historic farm buildings are unconverted and 92 per cent of them are structurally intact.
- Canals have benefitted from restoration and public access improvements, including the Wiltshire and Berkshire Canal.
- Ridge and furrow suffers from destruction and damage from farming activities.<sup>9</sup>

## Rivers

- Over the past ten years, water quality has benefitted from conservation work targeting the Thames tributaries around the Cotswold Water Park, between Lechlade and Northmoor and from the upper reaches of the River Ray downstream to Otmoor.

## Minerals

- Gravel extraction and consequent restoration has brought change in the landscape along the Thames and the Windrush, for example, as determined by restoration schemes. Such changes are localised, with the Cotswold Water Park being the largest example. In 2007, planning permission for extraction affecting 370 ha of the Cotswold Water Park had been secured and additional areas were being proposed.<sup>10</sup>

<sup>9</sup> Turning the Plough Update Assessment 2012, English Heritage (2012)

<sup>10</sup> Strategic Review and Implementation Plan for The Cotswold Water Park (May 2007; URL: [www.waterpark.org/wp-content/uploads/2013/03/CWP-Stage-1-Summary-FinalMASTER-271108.pdf](http://www.waterpark.org/wp-content/uploads/2013/03/CWP-Stage-1-Summary-FinalMASTER-271108.pdf))

## Drivers of change

### Climate change

- Wetter winters and drier summers may impact on the flow regimes of the area's watercourses, namely the Upper Thames and numerous Thames tributaries that drain the area, including the Ray and Cherwell.
- There is potentially a higher frequency of storms and heavier downpours. Flooding has significant implications for settlements both within and downstream of the NCA. Flash flooding is likely due to the underlying clay geology and, particularly in flat areas, land may be underwater for long periods before drainage partly to restrict flooding of settlements further downstream. Human responses to flood risk will range from attempts to store water to engineering watercourses and ditches to channel water quickly through an area.
- Drought may place the area's semi-natural wetland habitats under further stress (including reed beds and wet meadows), ultimately leading to a deterioration in both quality and extent of this important resource (alongside the further pressures of a reduced water supply).
- The treecover and hedgerow composition within the area could be affected through changes in temperature. Warmer winters could promote increased tree growth and favour non-native species, while distinctive veteran trees such as oak and black poplar may become susceptible to increased wind-throw and drought, and the increased likelihood of disease.
- Longer growing seasons and different crop timings could result in the introduction of new crops into the arable landscape, while increased arable cropping as a result of drier conditions could threaten remaining areas of pasture within fertile river valleys and plains.



River Cherwell in flood.

## Other key drivers

- Settlement expansion, associated infrastructure development and mineral extraction are key drivers in this area.
- Future mineral extraction is planned in the area, including the Cotswold Water Park and the Windrush Valley. In the Cotswold Water Park there is sufficient extractable resource at current levels of production for a further 20 years of activity and a further 10–15 years at a lesser level until the resource is effectively exhausted. Restoration opportunities include creation of wetlands and spaces for recreation. Future restoration at the Cotswold Water Park will favour wetland over open water habitats, helping to guard against bird strike affecting flying aircraft.
- Further development pressure in the flood plains may result in increased difficulties in water flow management and pollution.
- The decommissioning of the old Didcot Power Station and building of its replacement may present opportunities for landscape enhancement and biodiversity improvements.
- Flooding of rural and urban environments will remain a key challenge on the flood plain. Land use and the management of watercourses and ditches will be influenced by flood risk. Wet woodland may be encouraged in the flood plain to intercept and slow run-off. Demand for increased provision for floodwater storage will potentially give rise to greater areas of wet grassland, ponds, scrapes, reedbeds and ditches and sustainable urban drainage systems.
- Demand for renewable energy will give rise to new land uses. Land-based solar arrays are predicted around Swindon and biomass may drive management of existing woodlands and woodland creation.
- Ongoing threats from non-native invasive species, both those already present in the Thames such as signal crayfish, crassula and mink and future pests, can be exacerbated by irresponsible recreational river use.
- Demand for water may give rise to reservoirs at the farm scale and larger scale.



Didcot power station.



## Supporting document 3: Analysis supporting Statements of Environmental Opportunity

The following analysis section focuses on a selection of the key provisioning, regulating and cultural ecosystem goods and services for this NCA. These are underpinned by supporting services such as photosynthesis, nutrient cycling, soil formation and evapo-transpiration. Supporting services perform an essential role in ensuring the availability of all ecosystem services.

Biodiversity and geodiversity are crucial in supporting the full range of ecosystem services provided by this landscape. Wildlife and geologically-rich landscapes are also of cultural value and are included in this section of the analysis. This analysis shows the projected impact of Statements of Environmental Opportunity on the value of nominated ecosystem services within this landscape.



Stanton Harcourt church.

Statement of Environmental Opportunity	Ecosystem Service																		
	Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/ Inspiration	Sense of history	Tranquillity	Recreation	Biodiversity	Geodiversity
SEO 1: Along the Thames and its tributaries, promote sustainable farming and best practice mineral working in order to conserve and restore semi-natural habitats, historic features, geodiversity, soil quality and soil carbon stores and also to regulate water flow in this area and downstream. Ensure conservation of Oxford Meadows Special Area of Conservation and North Meadow and Clattinger Farm Special Area of Conservation. Engage the public in river heritage and maintain traditional land management practices where appropriate. <sup>1</sup> Along the Thames and its tributaries,	↔ **	↔ **	↗ **	↔ ***	↔ **	↗ **	↑ ***	↑ ***	↗ ***	↗ ***	↗ ***	↔ ***	n/a	↑ ***	↑ ***	↗ **	↗ **	↑ ***	↗ **
SEO 2: Manage farmland across the Upper Thames Clay Vales to produce food sustainably and to maintain sense of place. Taking a catchment approach, improve filtration of pollutants and regulation of water flow by realising a farmland habitat mosaic that incorporates strategic areas of wet grassland, reedbed, wet woodland and ponds as well as ditches and hedgerows.	↗ *	↗ **	↗ **	↔ ***	↔ ***	↗ **	↑ ***	↑ ***	↗ ***	↗ **	↗ **	↗ ***	n/a	↑ **	↗ **	↔ **	↔ ***	↗ **	↔ ***
SEO 3: Ensure that heritage assets, especially characteristic features such as ridge and furrow, abandoned medieval villages, Roman roads, canals and historic parkland, including Blenheim Palace World Heritage Site, are maintained in good condition. Integrate conservation of these features with sustainable food production and provide public access to key examples. Seek opportunities to restore the wider historic setting of a feature, particularly in relation to the historic Royal Hunting Forests of Bernwood, Braydon and Wychwood.	↔ **	↗ **	↔ ***	↔ ***	↔ ***	↔ ***	↔ ***	↔ ***	↗ **	↗ **	↔ ***	↔ ***	n/a	↑ ***	↑ ***	↔ *	↑ ***	↗ ***	↔ **
SEO 4: Realise sustainable development that contributes positively to sense of place and built heritage. Ensure adequate greenspace in association with all development and most importantly in growing settlements such as Aylesbury and Swindon. Create and manage greenspace to provide benefits for biodiversity, floodwater management, filtration of pollutants, tranquillity and recreation, and secure strategic access routes between town and country.	↔ ***	↔ ***	↗ *	↔ ***	↗ *	↔ **	↑ ***	↑ ***	↔ **	↔ **	↗ **	↔ ***	n/a	↑ **	↗ *	↗ *	↑ ***	↔ ***	↑ **

Note: Arrows shown in the table above indicate anticipated impact on service delivery: ↑ = Increase ↗ = Slight Increase ↔ = No change ↘ = Slight Decrease ↓ = Decrease. Asterisks denote confidence in projection (\*low \*\*medium \*\*\*high) ° symbol denotes where insufficient information on the likely impact is available.

■ National Importance; ■ Regional Importance; ■ Local Importance



## Landscape attributes

Landscape attribute	Justification for selection
<b>Low-lying clay-based flood plains coursed by the River Thames and its dense network of tributaries and ditches, often lined by willow, reed and, in the Aylesbury Vale and Cotswold Water Park, native black poplar.</b>	<ul style="list-style-type: none"> <li>■ Lowest elevation is 39 m AOD. Rivers such as the Thame have shallow gradients.<sup>11</sup></li> <li>■ River Thames and its tributaries drain the Vales, their headwaters flowing off the Cotswolds to the north or emitting from the springline along the Chilterns and Downs escarpments.</li> <li>■ Numerous upper tributaries of the Thames flow off the Cotswolds dipslope into a vale bounded by the Midvale Ridge. The Midvale Ridge constrains the river network within a narrow corridor, giving rise to a high density of watercourses and ditches. The Thames breaks through at Oxford to pass into a wider vale to the south where watercourses and ditches are at a lesser density than the northern vales.</li> <li>■ Willows have historically been pollarded. Ditches full of reeds are particularly characteristic in the wetter areas north of the Midvale Ridge.</li> <li>■ Native black poplars are distinctive of the Aylesbury Vale and Cotswold Water Park.</li> </ul>
<b>Long and wide views across open fields, small and occasional woods. High ground in adjacent NCAs provides a backdrop and there are strong linear features in the form of hedgerows, tree belts, ditches and roads.</b>	<ul style="list-style-type: none"> <li>■ Woodland cover is only 3 per cent of the NCA. Historically, the area was more wooded, with more extensive wet woodland and mature elm trees.</li> <li>■ The Great Western Community Forest is a focus area for sustainable regeneration although not particularly well wooded.</li> <li>■ The Chilterns, Berkshire and Marlborough Downs and Midvale Ridge rise up abruptly from the Vales in adjacent NCAs. The Midvale Ridge is a much smaller feature than the Chilterns and Downs.</li> <li>■ Parliamentary enclosure determined much of the field pattern in this NCA. As a result, boundaries are straight and defined strongly by hedgerows and roads.</li> </ul>
<b>Superficial deposits create undulating topography across much of the area. Better drained land on higher ground is often settled and cultivated. A legacy of mineral extraction gives rise to geological exposures, numerous waterbodies supporting wildfowl and a nationally important complex of marl lakes.</b>	<ul style="list-style-type: none"> <li>■ Superficial deposits cover 40 per cent of the NCA including alluvium and gravel terraces.</li> <li>■ Arable land is concentrated on higher ground, away from the wetter flood plain where soils are heavy to cultivate.</li> <li>■ SSSI and Local Geological Sites aim to conserve important geological exposures in redundant quarries and small pits.</li> <li>■ Where mineral extraction takes place, pits naturally fill with water. There are over 100 lakes comprising the Cotswold Water Park, creating a distinctive landscape and popular with bird-watchers. Limestone gravels from the Cotswolds give rise to marl formation.</li> </ul>

<sup>11</sup> Thames Corridor Catchment Abstraction Management Strategy, Environment Agency (2004)

Landscape attribute	Justification for selection
<b>In the river corridors, grazed pasture dominates with limited areas of historic wetland habitats including wet woodland, fen, reedbed and flood meadow. Wet grassland supports breeding birds. Snake's head fritillary flowers in internationally important meadows.</b>	<ul style="list-style-type: none"> <li>■ Wet ground conditions and heavy clay soils discourage cultivation in many places, giving rise to livestock farming. Most grassland is improved or semi-improved.</li> <li>■ This NCA has around 7,200 ha of flood plain grazing marsh, 1,700 ha of wet woodland and 1,300 ha of lowland meadows and 600 ha of fens. There are also rich and extensive ditch systems around Otmoor, the upper River Ray, and the River Thames near Wallingford and in the Lower Windrush Valley.</li> <li>■ Some river valley meadows and pastures are important for wading birds, including regionally important breeding numbers of lapwing, snipe, curlew and redshank, and large wintering numbers of lapwing and golden plover. Scrapes have been created in some areas to encourage such birds, as for example around the River Ray in Buckinghamshire.</li> <li>■ Limited fields have retained their species-richness, including traditional flood meadows where soil fertility has been sustained by seasonal flooding. There are two areas of flood meadow designated for their importance at a European level as Special Areas of Conservation (SAC).</li> <li>■ North Meadow and Clattinger Farm SAC supports over 90 per cent of the country's fritillary population.</li> </ul>
<b>A mosaic of mixed agriculture, ponds and small woods. Relict orchards remain on the Greensand.</b>	<ul style="list-style-type: none"> <li>■ Supports typical farmland wildlife such as brown hare, bats, barn owl and skylark.</li> <li>■ Fertile soils associated with the limited area of Greensand adjacent to the Chilterns and Berkshire and Marlborough Downs have historically been a focus for orchards.</li> <li>■ The Aylesbury Vale was known for its plums known as Aylesbury prune.</li> </ul>
<b>A regular, planned field pattern defined by boundaries of thorn hedgerows, often with mature hedgerow trees, stone walls near the Cotswolds and straight roads. Smaller fields are found around villages while large arable fields are particular to the Vale of White Horse.</b>	<ul style="list-style-type: none"> <li>■ Field pattern was largely set out by Parliamentary enclosure and is well-ordered and defined by straight boundaries and roads. Earlier smaller, irregular fields persist around villages.</li> <li>■ Large arable fields with a less dense hedgerow network characterise the Vale of White Horse. This field pattern resulted from the enclosure of medieval strip fields.</li> <li>■ Mature hedgerow trees, including veterans, are found in many hedges. Elm was once a mature hedgerow tree characteristic of this area but now it is a shrub component only.</li> <li>■ Blackthorn and hawthorn were the typical hedge species of Parliamentary enclosure.</li> <li>■ Near the Cotswolds, the availability of Cotswold stone has led to stone walls in this locality.</li> </ul>

Landscape attribute	Justification for selection
<b>Relict features of ancient Royal Hunting Forests of Bernwood, Braydon and Wychwood include embankments, veteran trees and clusterings of small ancient woods. Designed parkland landscapes are sparsely scattered, including Blenheim Palace World Heritage Site.</b>	<ul style="list-style-type: none"> <li>■ Historic Royal Hunting Forests comprised a mosaic of open grassland and woodland. Small ancient woodlands, veteran trees and embankments are relict features of these Royal Hunting Forests. Mature field oaks are a feature south of the Midvale Ridge. Bernwood lay around Brill, Wychwood east of Witney and Braydon near Swindon.</li> <li>■ Braydon Forest supports a patchwork of broad-leaved woodland blocks (often ancient semi-natural or replanted) and small fields delineated by mature, species-rich hedgerows. Woodland cover is locally high here compared with the wider NCA.</li> <li>■ There are 38 Registered Parks and Gardens (many are associated with the Oxford Colleges). Buscot, Claydon and Hartwell are examples. These large estates most likely evolved from the ancient Royal Hunting Forests.</li> <li>■ Part of Blenheim Palace World Heritage Site lies in this NCA. It was designated in 1987 in recognition of the international significance of the architecture of its buildings and the landscaped grounds. The famous landscape designer Lancelot 'Capability' Brown worked at Blenheim to create 'one of the greatest examples of naturalistic landscape design'.<sup>12</sup> Blenheim influenced designs elsewhere in England and abroad.</li> </ul>
<b>Pasture preserves historic earthworks, including ridge and furrow and, concentrated in the Aylesbury Vale, deserted medieval villages. Roman roads, castles and historic bridges are striking features.</b>	<ul style="list-style-type: none"> <li>■ Nationally important survivals of ridge and furrow include those at West Hanney, Denchworth, Lodgershall, Hogshaw and Creslow.</li> <li>■ Deserted medieval villages include those at Quarrendon, Fleet Marston and Creslow.</li> <li>■ There are 245 Scheduled Ancient Monuments.</li> <li>■ Roman roads include Ermine Way and Akeman Street.</li> <li>■ Castles include Shirburn and Wallingford.</li> <li>■ River crossing points have long been a focus for settlement and there is a rich history around bridges in this NCA. Wallingford and Abingdon are noted for historic bridges.</li> </ul>
<b>Brick, tile, timber and thatch are traditional building materials across the area, combined with Cotswold stone near the Cotswolds and occasional clunch and wichert near the Chilterns.</b>	<ul style="list-style-type: none"> <li>■ Local clay enabled bricks and tiles to be made for local use.</li> <li>■ Stone available from the Cotswolds was used to construct buildings and walls in that locality. Near the Chilterns, clunch (a chalk rock) was occasionally used.</li> <li>■ Wichert was a plaster made by mixing chalky marl with straw or earth. It was often colour-washed, as seen at Haddenham and Cuddington.</li> <li>■ Thatch is seen across the area and characteristic of many villages such as Stanton Harcourt and Sutton.</li> </ul>
<b>Historic settlement is found sparsely dispersed on higher ground and exceptionally at river crossing points such as Abingdon. Large urban areas comprise Aylesbury and outskirts of Oxford and Swindon, plus growing towns dispersed across the NCA such as Didcot, Bicester, Witney and Thame. A web of A roads connects major settlement, while the M4 and M40 pass through.</b>	<ul style="list-style-type: none"> <li>■ Settlement has mostly been avoided in areas liable to flooding, except at river crossing points such as Standlake. Large towns of Abingdon and Wallingford are historic crossing points.</li> <li>■ Aylesbury and Swindon are major urban centres, having been a focus for recent growth.</li> <li>■ Industrial uses include Didcot Power Station and car factories at Swindon and Oxford.</li> <li>■ The dispersed nature of settlement means that there are A roads connecting large towns. Numerous A roads emanate from Oxford, Swindon and Aylesbury.</li> </ul>

<sup>12</sup> Nominations to the World Heritage List (WHC-08/32.COM/8B.Add), UNESCO (2008)

## Landscape opportunities

- Conserve historic features in the flood plains, including traditional flood meadow, pasture, pollarded willows, historic bridges and Scheduled Monuments.
- Conserve wetland habitat in the flood plains, from species-rich ditches to lowland meadow to wet grassland supporting breeding birds including waders.
- Restore and create wet grassland, ponds and fens in the flood plains. Create new woodlands in places where enclosure of the landscape does not negatively impact upon valued views and does not impinge upon open habitats such as wet grassland providing for breeding waders.
- Manage and restore extraction pits to avoid negative impacts upon the landscape. Create wetland habitat as hydrological conditions sustainably allow, providing for a range of wildlife and contributing positively to the wider mosaic of habitats in the landscape.
- Maintain hedgerows, hedgerow trees and stone walls as strong landscape features which also contribute to the ecological network. Maintain characteristic native black poplars in the Aylesbury Vale and Cotswold Water Park.
- Conserve veteran trees in fields, hedgerows and woods. Ensure there are successor trees and retain deadwood where possible.
- Conserve small woodlands, particularly ancient woodlands and semi-natural woodlands. Explore opportunities to restore woodland within the historic Royal Hunting Forests and consider new woodlands and tree screens as part of development. Avoid new woodlands and overgrowth of hedgerows where they will obstruct valued views or otherwise enclose an open landscape, including grasslands supporting waders.
- Maintain the mix of agriculture and the mosaic of farmland habitats. Consider ways to increase heterogeneity of the arable landscape of the Vale of White Horse, for example ponds, grass strips, beetle banks and non-cultivated field corners. Restore and create orchards and restore semi-natural habitats associated with historic Royal Hunting Forests in order to enhance the farmland habitat mosaic and conserve historic land use.
- Conserve the built and natural heritage of Registered Parks and Gardens, including Blenheim Palace World Heritage Site. Assess non-registered parklands to determine the need for conservation and designation.
- Encourage continued use of traditional building materials. Where possible, integrate with conservation of geological exposures at extraction sites.
- Conserve historic settlement pattern and historic buildings. Manage the expansion of settlements such as Swindon and Aylesbury.

## Ecosystem service analysis

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Food provision</b>	Grade 1 and 2 agricultural land  Orchards  Livestock	<p>A range of food is produced in this NCA. Grade 1 and 2 agricultural land is found over 16 per cent of the NCA and allows for growing of cereals and, near Harwell for example, orchard fruit. Grade 3 land accounts for 45 per cent and Grade 4 for 33 per cent giving rise to considerable areas under grass managed largely for sheep. Dairy accounts for only 6 per cent of farms.</p> <p>Quaternary and alluvial deposits around the upper tributaries of the Thames, as for example in the west Oxfordshire district, and around the confluence of the Thame and Thames in south Oxfordshire make these areas fertile, freely draining and easily cultivated. Where these deposits are absent and consequently farming is directly on clay, agricultural land is not easily cultivated and is Grade 4. Grade 4 land is particularly concentrated in Aylesbury Vale and Cherwell districts.</p>	Regional	<p>Some of the most productive soils are sandy brownearths developed from the Greensand, which protrudes from beneath the Chalk scarp of the Chilterns. This is an important area for farming, contributing to employment, economy and maintenance of farmland habitats and landscape character.</p> <p>Waterlogging and flooding of farmland is a significant impediment to farming in this NCA.</p> <p>Agricultural activities and their sustainable management are closely linked to many of the cultural aspects of the area; the sense of place, biodiversity, sense of history and heritage assets.</p> <p>Inappropriate agricultural activities can result in soil erosion and diffuse pollution, and reductions in soil quality and soil carbon storage. In some locations, well-managed production may have the capacity to increase outputs and given the close association between soil quality, water quality and stock rates and production.</p>	<p>Continue to work with the local farming community through environmental stewardship and other mechanisms to ensure sustainable production, avoiding adverse impacts on other ecosystem services such as soil and water quality.</p> <p>Conserve soils and manage water storage in order to guard against widespread waterlogging and compaction. This will maintain productivity and also better regulate water flow.</p> <p>Manage high-grade agricultural land under sustainable farming practices in order to maintain production in the long term and avoid negative impacts upon the environment.</p> <p>Identify areas where reduced stocking rates or changed management techniques would positively influence water quality and reduce potential soil erosion along riverbanks, while maintaining viable levels of productivity.</p> <p>Explore opportunities for arable reversion where this will increase the sustainability of food provision and secure benefits for regulating water flow and conserving soils.</p> <p>Conserve traditional orchards in the interests of food provision, sense of place and nature conservation.</p>	<p><b>Food provision</b></p> <p><b>Regulating water flow</b></p> <p><b>Biodiversity</b></p> <p><b>Genetic diversity</b></p> <p><b>Regulating soil quality</b></p> <p><b>Regulating soil erosion</b></p> <p><b>Water availability</b></p>



Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Timber provision</b>	Woodland  Hedgerow trees  Historic coppice	Woodland cover amounts to 3 per cent or 6,300 ha of the NCA, although there is additional resource in the form of small woodlands or copses. Only 0.4 per cent or 670 ha is coniferous plantation. Non-native poplar plantations are a feature in some parts of the NCA.  Hedgerow trees are a distinctive feature of Aylesbury Vale, for example, and so represent a potential timber resource.	Local	Timber provision is limited by existing woodland cover and, in 2003, only 22 per cent of woodland was managed under a woodland grant scheme. The timber resource is likely to be neglected as a minor land use. Remaining coppice stands are likely to be in poor condition.  Designation of the Great Western Community Forest across 14 per cent of the NCA may stimulate tree planting in this area to boost timber provision.	There may be limited opportunities for woodland creation, helping to manage flows of water and limit soil erosion; however, their use for timber production will be limited. Sites supporting other semi-natural habitats, important species and heritage assets will need to be avoided.  Plant small woodlands as a connected network to realise opportunities relating to efficiency of forestry activities, to control of pests and diseases and to improve biodiversity.  Conserve trees of local provenance and encourage natural regeneration rather than planting in order to maximise resilience against pests and diseases. This will secure the timber resource and associated biodiversity and sense of place attributes.	<b>Timber provision</b>  <b>Biodiversity</b>  <b>Pest regulation</b>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Water availability</b>	<p>Rivers and streams</p> <p>Chalk aquifers</p> <p>Aquifers based upon superficial deposits</p> <p>Reservoirs</p>	<p>There is a high density of watercourses and ditches and also reservoirs managed for public water supply, for example at Farmoor.</p> <p>Across the clay, watercourses, ditches and associated wetland habitats are fed by surface water<sup>13</sup> and there is no baseflow supported by groundwater.</p> <p>Principal aquifers associated with Chalk bedrock in the adjacent Chilterns and Berkshire Downs extend a little into this NCA. There are springlines along the base of the Chilterns and Berkshire Downs escarpments for example. The source of the NCA's watercourses also originates from these aquifers and also the Cotswolds.</p> <p>Secondary aquifers relating to deposits overlying the clays associated with watercourses are characteristic. Deposits are particularly widespread around the upper reaches of the Thames river system.</p> <p>There are interconnections between the River Cherwell and the Oxford Canal.<sup>14</sup> Water levels in these waterways are therefore interdependent.</p> <p>Abstraction is predominantly for public water supply, with smaller volumes for agriculture. Surface water abstraction is dominated by supply to Farmoor Reservoir, which provides for Oxford, Banbury and Swindon in neighbouring NCAs.<sup>15</sup> Farmoor Reservoir relies on the Cotswolds aquifer for 60 per cent of its water. Water was also taken from the Thames for Didcot Power Station, but this has since closed. Elsewhere, abstraction is from groundwater.</p> <p>Abstraction demands upon the Thames river system downstream of the NCA, including London, means that there is no water available for licensing at low flows in this NCA.</p>	National	<p>Principal aquifers are largely absent, so groundwater is not stored within the NCA and rainwater flows out of it as surface water. Any type of reservoir, including the large reservoir at Farmoor, is important for storing water locally. Growth of settlements within the NCA such as Aylesbury and in adjacent NCAs such as Swindon will place new demands upon water availability.</p> <p>The Thames Region is one of the driest regions in the UK. It receives an average of 690 mm of rainfall each year compared to a national average of 897 mm.<sup>16</sup></p> <p>Public water supply demands across the wider Thames Region require that water use in the upper reaches takes account of supply needs downstream. Storage or transfers of water into this NCA have been considered by the water companies to secure adequate water supply locally and further downstream, including a proposal for a new reservoir near Abingdon.</p> <p>Superficial deposits which function as secondary aquifers are also a focus of mineral extraction. Mineral operators have to manage against negative impacts upon hydrology.</p> <p>Across the clay, rainfall has a direct and immediate impact upon surface waters, with 'flash' flooding possible.</p> <p>Water availability is of significance to wetland habitats and species, including designated sites and legally protected species. Plant communities will alter where there is a change in water regime towards drier, wetter or more disturbed conditions. The Oxford Meadows SAC comprises grasslands that are seasonally flooded; a habitat which is very restricted nationally. Habitats are made more vulnerable by a history of drainage and their small size, for example, small fragments of fens.</p>	<p>Seek opportunities to store, hold and retain water for slower release and manage reservoirs and watercourses to allow sustainable water abstraction.</p> <p>Encourage efficient water use and storage of water, for example farm reservoirs and water butts, among the general public and across the business sector within and beyond the NCA.</p> <p>Work with land managers to promote good farming practices to improve the structure of soils, thereby improving infiltration of rainwater and reducing surface flow. For example, manage and create landscape features to slow flows of surface water, such as wet woodland and flood plain grassland. This guards against flash flooding, manages pollutants and enhances biodiversity.</p> <p>Monitor and manage water levels in relation to water-dependent features, including Oxford Meadows SAC.</p>	<p><b>Water availability</b></p> <p><b>Regulating water flow</b></p> <p><b>Biodiversity</b></p> <p><b>Regulating water quality</b></p>

<sup>13, 14</sup> Cherwell, Thame and Wye Catchment Abstraction Management Licensing Strategy, Environment Agency (2012)

<sup>15, 16</sup> Thames Corridor Catchment Abstraction Management Strategy, Environment Agency (2004)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Genetic diversity</b>	Oxford Sandy and Black pig  Aylesbury duck  Aylesbury prune  Native black poplar	There are low numbers of the Oxford Sandy and Black pig in this NCA.  The area around Aylesbury has a history of duck rearing.  Aylesbury prune is included in the National Fruit collections at Brogdale.  Ancient oaks are found in Blenheim Park.  Native black poplars growing in Aylesbury Vale and the Cotswold Water Park Black are important for the genetic diversity and survival of this species.	Regional	The Oxford Sandy and Black pig is one of the oldest British pig breeds in the country. <sup>17</sup> The breed originated and developed in the Oxfordshire region.  It is likely that there are Aylesbury duck kept and bred in the NCA but the only commercial flock is located in the Chilterns, outside the NCA.  Local nurseries stock Aylesbury prune (a plum) and trees are found in remnant traditional orchards and hedgerows.  Some of the ancient, oak pollards of Blenheim Park may be direct lineal descendants of those recorded in the Domesday survey.  Work to conserve national populations of native black poplar centres upon the Aylesbury Vale.	Conserve traditional local breeds, including the Oxford Sandy and Black pig and Aylesbury duck for the benefit of genetic diversity, food provision and sense of place.  Conserve and restore traditional orchards and ancient hedgerows in order to secure local genetic material, particularly in relation to Aylesbury prune.  Seek biodiversity, sense of place, food provision and recreation benefits.  Conserve native black poplars for biodiversity and for sense of place.	<b>Genetic diversity</b>  <b>Food provision</b>  <b>Sense of place/ inspiration</b>  <b>Biodiversity</b>
<b>Biomass energy</b>	Remnant coppice  Existing woodland	This area has a woodland cover of 3 per cent, meaning potential biomass from existing woodland sources is limited. Coppice is found in some woods, but is often neglected.	Local	As a result of the varying underlying geology, potential miscanthus yield varies greatly across the area between medium and high. The potential yield for short rotation coppice is largely medium, but high in north-eastern areas between Oxford and Milton Keynes.  Planting short rotation coppice along watercourses and ditches may be feasible where this also contributes to managing floodwaters and enhances biodiversity. The restoration of gravel extraction areas may also allow for landscaping which accommodates short rotation coppice and miscanthus.  Planting short rotation coppice or miscanthus in those parts of the NCA where there are uninterrupted long views would alter sense of place. A long history of livestock farming and associated grassland management in many areas of the NCA makes planting of crops incongruous. Visual impacts from high ground in neighbouring NCAs should also be considered.	Explore opportunities to establish short rotation coppice in locations where it also manages floodwaters and enhances biodiversity, including mineral extraction areas, but does not impact negatively on sense of place or upon open habitats, including wet grassland supporting breeding waders.  Restore neglected coppice and introduce coppice management where this provides biomass and enhances biodiversity.	<b>Biomass energy</b>  <b>Regulating water flow</b>  <b>Biodiversity</b>

<sup>17</sup> RBST Fact Sheet: Oxford Sandy and Black, Rare Breed Survival Trust (2012)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Climate regulation</b>	<p>Peat soils</p> <p>Long-term undisturbed/uncultivated soils</p> <p>Wetland habitats</p> <p>Woodland</p>	<p>There are around 25 ha of peat in the NCA, comprising small areas of deep peat soils around Thame and a single area of deep peat near the River Evenlode.</p> <p>Across almost all of the NCA there is a relatively low proportion of carbon stored in the top soil horizon (0–10 per cent), with soil carbon content being generally slightly higher to the east of the NCA than to the west.</p> <p>Soils that have not been cultivated, including areas of flood plain grassland, reedbed, fen and wet woodland, are long-standing carbon stores. There are approximately 7,200 ha flood plain grazing marsh, 1,700 ha wet woodland, 1,300 ha lowland meadow, 700 ha fen and 400 ha reedbed.</p> <p>There are 6,300 ha of woodland or 3 per cent cover. This low cover means that woodland carbon stores are limited.</p>	Local	<p>The predominance of mineral soils limits carbon content, particularly where it is cultivated over the long term.</p> <p>Storage capacity of soils is maximised where soils are undisturbed or uncultivated. Flood plain grasslands and other non-cultivated areas such as reedbed and wet woodland represent relatively intact carbon stores.</p> <p>Drainage of wet soils, including peat soils and fen, leads to loss of carbon and a reduction in storage capacity. The change in land use can also lead to deterioration of carbon stores.</p> <p>Woodland cover was higher in the past so woodland carbon stores have been lost.</p>	<p>Conserve areas of semi-natural wetland habitat, including flood plain grasslands, in order to maintain carbon stores, biodiversity and sense of place.</p> <p>Maximise carbon content by conserving and boosting organic content in soils. Protect peat soils and associated semi-natural habitat from damage.</p> <p>Create new woodlands where it will increase carbon sequestration and storage capacity. Avoid new woodlands where it will impact negatively upon sense of place, valued views and open habitats such as wet woodland supporting breeding waders.</p>	<p><b>Climate regulation</b></p> <p><b>Biodiversity</b></p> <p><b>Sense of place/ inspiration</b></p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Regulating water quality</b>	<p>Vegetated landcover, including grass strips and reedbed</p> <p>Low input grassland</p> <p>Semi-natural habitats including woodland, flood plain grazing marsh, and hedgerows</p>	<p>Features that potentially filter pollutants from run-off before they reach watercourses include pasture, grass strips, hedgerows and woodlands, and more localised areas of reedbed (400 ha) and wet woodland (1,700 ha).</p> <p>Water quality across the catchments is generally good but phosphates show high concentrations.<sup>18</sup> Phosphates are from diffuse and point sources. Cotswold Water Park SSSI is negatively impacted by pollution, including run-off from agriculture.<sup>19</sup></p> <p>The River Ray, in the Cherwell catchment, has been assessed as having bad ecological status. In the Cotswold catchment, the Rivers Evenlode, Glyme and Ampney Brook are suffering from phosphates, as is the Thame in the Thame catchment.<sup>20</sup></p>	Regional	<p>With a clay-based geology, there is limited percolation of water into soils and so filtration of pollutants from surface water is also limited. Vegetation such as reedbed and wet woodland can trap pollutants in run-off. Bare cultivated areas and access tracks provide no filter. In particular, heavy rainfall will give rise to significant run-off. There is potential to greatly strengthen the ability of semi-natural habitats to filter run-off by linking or expanding existing fragmented habitat.</p> <p>The entire NCA is a nitrate vulnerable zone. Water quality is regionally significant because the surface waters provide public water supply to major urban centres outside the NCA including Oxford, Swindon and downstream into London. Pollution of groundwater is a concern around Lechlade and along the southern border of the NCA in relation to principal aquifers of the Chilterns and Berkshire Downs. In the wider NCA, the nitrate vulnerable zone relates to surface waters.</p> <p>In a nitrate vulnerable zone, land managers time their chemical applications carefully and avoid excessive use. Low input grasslands are beneficial to water quality in this NCA.</p> <p>Despite features and land management practices to guard against water pollution, phosphates remain a problem. A large chlorinated solvents plume is also present in the groundwater body in the Vale of White Horse.<sup>21</sup></p> <p>There is also a bathing water beach at the Cotswold Water Park.</p>	<p>Implement catchment-wide water management plans to ensure a coordinated approach to reducing the impacts of pollution on water quality.</p> <p>Maintain and create a network of features which slow and filter run-off, such as wet grassland, grass strips and reedbeds.</p> <p>Create and manage buffer strips beside watercourses and ditches. This will regulate water quality and water flow, with consequent benefits for soils and biodiversity.</p> <p>Encourage wider use of low input and efficient approaches relating to phosphate use such as precision farming. This will bring benefits for biodiversity.</p> <p>Encourage adoption of sustainable land management practices to improve the soil structure through increasing organic matter, reducing compaction and promoting sustainable management to minimise the loss of sediments.</p>	<p><b>Regulating water quality</b></p> <p><b>Regulating water flow</b></p> <p><b>Regulating soil erosion</b></p> <p><b>Biodiversity</b></p>

<sup>18, 19, 20, 21</sup> River Basin Management Plan – River Thames Basin District, Environment Agency (2009)



Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Flood plain	Flood risk occurs along the course of the River Thames and its tributaries, and winter flooding is a regular event. Settlements in the flood plain and therefore at risk of flooding include Lechlade and Abingdon. Flood defences have been constructed to protect places such as Lechlade and Kidlington.  Watercourses have been modified across the NCA to regulate water flow. Water level management structures include locks, sluices and ditches. The few remaining traditional flood meadows retain historic water level management features. The Thames has a long history of monitoring stations. Surface run-off is slowed by features such as hedgerows, grass strips, woodland and reedbed. There are approximately 7,200 ha flood plain grazing marsh, 6,300 ha woodland, 1,300 ha lowland meadow, 700 ha fen and 400 ha reedbed.  Mineral workings offer opportunities to store and manage water.	National	This is an area of low to medium flood risk. There is high potential for flooding from surface and river water but the density of settlement is low. Roads and railways are affected when adjacent ditches reach capacity. However, impact can be considerable as illustrated when widespread flooding occurred in 2007 and 2014. <sup>22</sup>	Encourage a catchment management approach through working with landowners, farmers, the Internal Drainage Boards, statutory agencies and conservation bodies to best manage the flow of water across the landscape. Ensuring floodwater is accommodated in areas where there is minimal impact on food production and maximum benefit for biodiversity is essential.	Regulating water flow  Biodiversity  Regulating water quality  Sense of history
	Ditches			The Thames Catchment Flood Management Plan proposes guarding against flood damage by storing water and managing run-off, rather than creating large-scale flood defences. <sup>23</sup>	Review and realise flood-compatible land uses in the flood zone, seeking benefits for biodiversity and recreation where possible.	
	Locks and sluices			Management of water flow in this NCA has implications downstream into London. This is significant as the River Thames corridor becomes more densely populated downstream, for example at Reading and Maidenhead.	Maintain and create a network of semi-natural features which slow run-off. These features should also regulate water quality by filtering pollutants.	
	Traditional flood meadows			In Aylesbury, urban growth has meant that many rivers are modified and straightened to improve their capacity to convey water. Aylesbury is also a focus for further development and there are properties at risk of flooding.	Conserve and restore historic flood meadows, locks and ditches so that water levels can be managed for the benefit of water flow, sense of history and biodiversity.	
	Monitoring stations			Features to slow run-off are important in this NCA where the clay-based geology facilitates rapid run-off. Management of run-off will be particularly important where it protects significant numbers of properties and key infrastructure including roads.	Continue to monitor water flow to understand change over time.	
	Vegetated land cover			Restoring river channels, creating and managing riparian habitats as well as engineered schemes that store floodwater can provide long-term benefits for the regulation of water flow as well as river environment and wetland habitats.	Manage mineral workings and restoration schemes to avoid negative impacts upon local hydrology. Seek to regulate water flow in a way which also provides wildlife habitat and safe recreation opportunities.	
	Mineral extraction areas			Mineral workings modify local hydrology and can involve significant activities such as de-watering. Best practice guidance emphasises the importance of understanding and managing hydrological impacts. There are opportunities for storing water.		

<sup>22</sup> Environment Agency, Thames Catchment Flood Management Plan – Summary Report, 2009

<sup>23</sup> Thames Catchment Flood Management Plan – Summary Report, Environment Agency (2009)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Regulating soil quality</b>	Grade 1 and 2 agricultural land  Lime-rich soils  Undisturbed soils, including established fen soils  Permanent grassland  Traditional flood meadows	<p>There are nine main soilscape types in this NCA:</p> <ul style="list-style-type: none"> <li>■ Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils, covering 45 per cent of the NCA.</li> <li>■ Freely draining lime-rich loamy soils (16 per cent).</li> <li>■ Loamy and clayey flood plain soils with naturally high groundwater (8 per cent).</li> <li>■ Shallow lime-rich soils over limestone (8 per cent).</li> <li>■ Loamy soils with naturally high groundwater (6 per cent).</li> <li>■ Lime-rich loamy and clayey soils with impeded drainage (5 per cent).</li> <li>■ Freely draining slightly acid but base-rich soils (5 per cent).</li> <li>■ Freely draining slightly acid loamy soils (4 per cent).</li> <li>■ Slightly acid loamy and clayey soils with impeded drainage (3 per cent).</li> </ul> <p>Grade 1 and 2 agricultural land is found over 16 per cent of the NCA and allows for growing of cereals and, near Harwell for example, orchard fruit. Grade 3 land accounts for 45 per cent.</p>	Local	<p>Soil damage associated with compaction is particularly relevant in this NCA since slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils cover approximately 45 per cent and are prone to compaction and/or capping when wet. Compaction also leads to increased run-off, leading to erosion and sediment transport. The freely draining lime-rich loamy soils (16 per cent) are typically of moderate depth and droughty, but due to their calcareous nature they have a degree of natural resilience.</p> <p>Drainage of fen has occurred in the past, leading to shrinkage of the resource. Drying of fen soils releases carbon and a change in land use may cause soil quality to deteriorate. Keeping some soils wet is important to retain their carbon content especially those with a high peat content in the river valleys.</p> <p>Management that help to maintain a good soil structure such as increasing soil organic matter levels and the use of minimum tillage such as direct drilling will help improve soil quality, as well as reducing the potential for soil erosion in freely draining soils.</p> <p>Much of the NCA is in agricultural use where maintaining and improving the soil quality will safeguard and retain productive food provision in the long term and increase the soils resilience to climatic change and extreme weather events. Retaining and increasing the amount of semi-natural habitat and tree cover in this NCA would help keep and improve soil condition. Well managed permanent grassland will also conserve soils where compaction is avoided.</p> <p>Compared with other farming methods, traditional management of flood plain grassland and wetland habitats is low intensity and involves limited input of artificial chemicals – this supports natural soil processes. Such management continues on land designated the Oxford Meadows SAC which totals 276 ha.</p>	<p>Practice sustainable farming techniques so that soil quality is conserved while also maintaining food provision and other services.</p> <p>Conserve permanent grassland and semi-natural habitat, including fen, in order to maintain soil quality and biodiversity and also guard against soil erosion and water pollution.</p> <p>Maintain traditional management of historic grasslands in order to conserve soil quality, biodiversity and sense of history.</p> <p>Promote cultivation with soils in mind – adopting Defra's Code of Good Agricultural Practice (2009) and the Environment Agency's Think Soils initiative (2008) to avoid compaction and maintain good soil structures.</p> <p>Increase where possible the areas under woodland or permanent vegetation to stabilise the soil, increase quality with organic matter and soil fauna.</p>	<p><b>Regulating soil quality</b></p> <p><b>Food provision</b></p> <p><b>Regulating soil erosion</b></p> <p><b>Biodiversity</b></p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Regulating soil erosion</b>	<p>Soils with high moisture content</p> <p>Semi-natural wetland habitat</p> <p>Well-managed pasture soils</p> <p>Woodland, hedgerows and areas of permanent pasture</p>	<p>Soils across approximately 60 per cent of the NCA have a low risk of soil erosion. These soils are the slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (45 per cent), loamy and clayey flood plain soils with naturally high groundwater (8 per cent) and loamy soils with naturally high groundwater (6 per cent).</p> <p>Undisturbed and vegetated soils associated with semi-natural habitats such as reedbed and wet woodland are associated with low erosion risk. Permanent grassland also retains a long-term protective vegetation cover reducing soil erosion as opposed to cultivate areas which have a higher risk.</p> <p>The freely draining lime-rich loamy soils (16 per cent), the shallow lime-rich soils over chalk or limestone (8 per cent) and the freely draining slightly acid loamy soils (4 per cent) are at risk of erosion only on sloping land where cultivated or bare soil is exposed (such as along footpaths and tracks or as a result of outdoor pig rearing in the case of the soils over chalk/limestone).</p> <p>Drainage is impeded across nearly 10 per cent of the NCA, with these soils being susceptible to compaction. These are the slightly acid loamy and clayey soils with impeded drainage (3 per cent) and the lime-rich loamy and clayey soils with impeded drainage (5 per cent).</p>	Local	<p>There is a predominance of soils with intrinsic low erosion risk in this NCA and there are also considerable areas where soils are protected by vegetation, including permanent grassland.</p> <p>There are few steep slopes in the NCA to increase erosion risk but practices such as avoiding ploughing down a slope and managing run-off on access tracks remain relevant in this NCA. Slopes should be vegetated where possible to guard against erosion and rapid run-off.</p> <p>Wet conditions are common across this NCA due to the high density of watercourses and clay-based geology. Compaction by machinery or livestock on wet soils may result in increased surface water run-off which leads to further damage.</p> <p>Where soil loss is likely, whether by run-off or wind, the incorporation of organic matter will maintain or increase soil depth and improve soil structure, both of which combat soil loss.</p> <p>Guarding against soil erosion will also regulate pollution of water by sediment.</p>	<p>Work with farmers and landowners to choose options within agri-environment schemes or adopt best practice that will help to regulate soil erosion by avoiding exposure of soils (for example by introducing and incorporating green cover crops, fallow rotations, overwintering stubble or reversion to permanent grassland).</p> <p>Avoid activities causing compaction to conserve soils and consequently maintain food provision.</p> <p>Careful timing of operations is essential to avoid damage under wet conditions.</p> <p>Retain vegetation cover across slopes to guard against soil erosion and pollution of water by sediments.</p> <p>Seek and realise opportunities for introducing permanent grassland, woodland and restoring field boundaries along valley sides in areas particularly prone to soil erosion or adjacent to main rivers and their tributaries.</p> <p>Incorporate organic matter into soils that have a low organic content in order to combat soil erosion and boost carbon stores.</p>	<p><b>Regulating soil erosion</b></p> <p><b>Regulating water quality</b></p> <p><b>Food provision</b></p> <p><b>Climate regulation</b></p>

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<b>Pollination</b>	Flower-rich grasslands Hedgerows Orchards Flower-rich farmland strips	Nectar sources and habitat for pollinating insects include 1,300 ha of species-rich lowland meadow, a few remnant orchards, a network of hedgerows incorporating flowering thorn species and limited areas of flower-rich margins across farmland.	Local	Hedgerows and margins provide flower-rich habitat across the wider NCA. Insect pollinated crops grown in this NCA include rape.	Manage flower-rich habitats for the benefit of pollination, food provision and biodiversity.  Maintain a habitat network for pollinators across the NCA, recognising hedgerows and margins as key links in the network.	<b>Pollination</b>  <b>Food provision</b>  <b>Biodiversity</b>
<b>Pest regulation</b>	Beetle banks Field corners Hedgerows Mixed land use Self-generated tree stock	Farmland incorporates features such as beetle banks, field corners and hedgerows, which can harbour natural predators of pests affecting crops.  At a landscape scale, the mixed agricultural landscape increases heterogeneity.  Local genetic diversity among tree species such as the ash as a result of self-generation increases resistance against pests and diseases.	Local	The mixed agricultural landscape combined with the network of hedgerows and watercourses offers considerable heterogeneity that guards against widespread infection. However, the connectivity of this mosaic may facilitate spread of disease and pests.	Conserve local genetic stock of tree species for pest regulation, timber provision and biodiversity benefits.  Maintain mixed agricultural land uses and a network of hedgerows and watercourses to regulate pests affecting food provision.	<b>Pest regulation</b>  <b>Biodiversity</b>  <b>Timber provision</b>  <b>Food provision</b>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Sense of place/ inspiration</b>  <i>Continued on next page</i>	<p>Wide flood plain landscape</p> <p>Straight field boundaries and routes</p> <p>Open water – watercourses, ditches, water-filled gravel pits</p> <p>Black poplars, willow</p> <p>River Thames</p> <p>Locks</p> <p>Pasture and traditional flood meadow</p> <p>Wet habitats – reedbed, fen, wet woodland</p> <p>Waders, particularly curlew</p> <p>Wintering wildfowl</p> <p>Snake's head fritillary</p> <p>Settlements at river crossing points</p>	<p>A relatively flat flood plain landscape with long views, large skies and water as a predominant feature. The straight lines of field boundaries and access routes emphasises long views. High ground of adjacent NCAs, such as the Chilterns, provides a backdrop.</p> <p>Numerous watercourses, ditches, ponds and water-filled gravel pits exist around the upper reaches of the Thames tributaries. Reeds are often found growing in ditches and wet fields. Willows and, to the east in the Aylesbury Vale, black poplars, line the waterways.</p> <p>The most significant watercourse is the Thames, with associated historic settlements, locks and bridges. The Thames Path mostly follows the watercourse and the river itself is popular for boating and fishing. More than 300 events are held on the Thames each year mostly in the downstream sections, the upstream areas being relatively quiet. Famous writings are associated with the Thames including Jerome K. Jerome's Three Men in a Boat.</p> <p>Historic flood plain grasslands are restricted in number across the country and this NCA holds</p>	Regional	<p>Superficial deposits and resistant bedrock lie upon typically level clay bedrocks, giving rise to a gently undulating to flat landscape. Aylesbury Vale is largely absent of superficial deposits and so it is the least undulating. The small knoll of Wittenham Clumps rising out of the Vale is particularly well known since it inspired the painter Paul Nash as well as prehistoric man before him, in the building of a hill fort.</p> <p>Waterside vegetation including trees and reeds emphasise the line of waterways. Thorn hedgerows define the straight boundaries of most fields and access routes as a result of planned enclosure. Some watercourses are relatively straight having been modified to improve conveyance of water and, when combined with drainage ditches, they dissect the landscape into regular shapes. Lewis Carroll was said to be inspired by the 'chequerboard' of Otmoor that existed when he was writing Alice in Wonderland.</p> <p>Hedges, hedgerow trees, field trees, small woodlands and tree clumps create a more wooded feel in the Aylesbury Vale than elsewhere in the NCA, with numerous mature field oaks giving a 'parkland' feel to the landscape. The loss of hedgerow elms across this NCA has affected its once-wooded character.</p> <p>The Thames is associated with a rich culture, history and archaeology. This river and the numerous other watercourses and wetlands attract wildlife and visitors. The Wildlife Trust, local authorities and others provide access to various places of natural and cultural interest. Visitors to the countryside can enjoy the sights and distinctive calls of curlew and lapwing as well as flower-rich grasslands and archaeology. Snake's head fritillary is a striking flower growing in a minority of meadows</p>	<p>Retain grassland as a distinctive land use and manage to minimise inputs, avoid soil disturbance, store floodwater and provide for flora and fauna. In doing so, seek to regulate water quality and flow and conserve soils, biodiversity and archaeology.</p> <p>Conserve and restore traditional flood plain features such as ditches, semi-natural wetland habitat, historic flood meadows, black poplar, willow pollards and historic bridges to conserve sense of place and conserve biodiversity and sense of history.</p> <p>Continue to promote and manage the River Thames as a nationally important corridor for people and wildlife and as a culturally significant landscape feature. Incorporate benefits across all ecosystem services.</p> <p>Review and conserve nationally important examples of ridge and furrow and deserted villages. Engage the public in this heritage.</p>	<p><b>Sense of place/ inspiration</b></p> <p><b>Regulating water flow</b></p> <p><b>Biodiversity</b></p> <p><b>Sense of history</b></p> <p><b>Geodiversity</b></p>



Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Sense of place/ inspiration</b>  <i>Continued from previous page</i>	<p>Historic buildings including castles and bridges</p> <p>Earthworks including ridge and furrow</p> <p>Traditional building materials including Cotswold stone and wichert</p> <p>Minerals extraction restoration</p>	<p>examples that are protected at a European level as SAC. The grasslands as well as other wetland habitats and watercourses attract birds, including snipe, curlew and lapwing. This area is one of only two lowland areas in England with a breeding curlew population. There are also nationally important numbers of wintering wildfowl. Livestock grazing pasture is a common sight.</p> <p>Many settlements retain historic buildings. Wallingford is rich in historic remains in the form of city walls and a castle. Deserted medieval villages and nationally important examples of ridge and furrow are found in the countryside.</p> <p>Cotswold stone, 'clunch' and 'wichert' are traditional building materials that vary in use across the NCA. Brick, tile and thatch are used relatively consistently.</p> <p>The availability of gravels and sands makes parts of this NCA a focus for mineral extraction. The Cotswold Water Park is a major feature, with over 100 lakes. Haulage vehicles drive through the area.</p>		<p>in the area and is celebrated in an annual festival at Ducklington near Witney. Visitor pressure is relatively limited, except around major urban centres such as Wallingford.</p> <p>Across the immediate flood plain and where there is a high density of watercourses, pasture dominates. Pasture preserves archaeological earthworks such as ridge and furrow and deserted medieval villages. The NCA is therefore nationally important for such archaeology.</p> <p>Local clays give rise to historic brick buildings. In addition, the availability of different building materials from neighbouring NCAs has given rise to a variety of building materials being used across the NCA. Near to the Cotswolds, stone is a traditional building material while 'clunch' (chalk blocks) from the Chilterns was a rare building stone in the south-east.</p> <p>Traditional buildings in the south are distinguished by a type of colour-washed plaster known as 'wichert' (a chalky marl mixed with straw or earth). Haddenham and Cuddington are examples of wichert. Thatch, both reed and straw, is found across the NCA.</p> <p>Continued demand for aggregates will stimulate ongoing extraction of minerals in places such as the Lower Windrush and Cotswold Water Park. These areas are places of landscape change and their restoration schemes are significant in determining the landscape in the longer term.</p>	<p>Promote ongoing use of traditional building materials. Draw on best practice examples from neighbouring AONB, seeking to strengthen sense of place and benefit geodiversity.</p> <p>Manage and restore mineral extraction areas to positively reflect local landscape character, conserve biodiversity and provide a range of ecosystem services.</p>	

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Sense of history</b>  <i>Continued on next page</i>	<p>Blenheim Palace World Heritage Site</p> <p>Scheduled Ancient monuments</p> <p>Registered Parks and Gardens</p> <p>Archaeology of medieval villages</p> <p>Ridge and furrow</p> <p>Canals and locks</p> <p>Historic flood meadow</p> <p>River Thames settlements</p> <p>Historic rural settlement pattern</p> <p>8,442 listed buildings</p>	<p>Blenheim Palace World Heritage Site is internationally recognised as being one of the greatest examples of naturalistic landscape design. The site is managed to conserve its Outstanding Universal Value and it has been open to visitors since at least 1950.</p> <p>There are 245 Scheduled Monuments, ranging from prehistoric ditches and enclosures to medieval villages to bridges, abbeys and castles. Monuments on the At Risk Register include several Roman villas, a Second World War airfield, ring ditches and the castle mound at Abingdon. There are no Scheduled Monuments at risk in Aylesbury Vale, Oxford or North Wiltshire.</p> <p>38 Registered Parks and Gardens, many associated with Oxford Colleges, and including Blenheim Palace World Heritage Site. There are four parks over 200 ha, with the largest being Eynsham at nearly 340 ha. There are vestiges of parks dating back to Saxon times, such as Bernwood, with veteran trees and ancient semi-natural woodland. There are no Registered Parks and Gardens on the At Risk Register although the condition of semi-natural interest such as veteran trees is not known.</p>	International	<p>A sense of history is evident in the wealth of visible archaeological remains including major features such as Roman roads, castle remains and designed landscapes such as Blenheim.</p> <p>Blenheim is managed according to a management plan agreed with partners including English Heritage. Visitors are managed to avoid negative impacts.</p> <p>Scheduled monuments cluster noticeably around the River Thames and its upper tributaries near Lechlade, Standlake and Dorchester.</p> <p>Pasture management has served to preserve earthworks including nationally important examples of ridge and furrow, enclosures and deserted villages.</p> <p>Nationally important examples of ridge and furrow include those at West Hanney, Denchworth, Lodgershall, Hogshaw and Creslow. Deserted medieval villages include those at Quarrendon, Fleet Marston and Creslow.</p> <p>Continuity of large estates has helped maintain at least the core of historic parkland and designed landscapes, including those at Blenheim and the Oxford colleges. At a large scale, there are embankments, ditches, ancient semi-natural woodland and veteran trees that are the vestiges of ancient Royal Hunting Forests (from north to south: Bernwood around Brill, Wychwood east of Witney and Braydon near Swindon).</p>	<p>Conserve and provide sustainable recreation to the Blenheim Palace World Heritage Site to maintain sense of history, sense of place and recreation interests.</p> <p>Avoid ploughing damage to heritage assets, ideally by reversion to grass which helps conserve soils and increases the heterogeneity of land use for the benefit of biodiversity.</p> <p>Review historic structures such as bridges and canals to secure management of water levels while also conserving sense of history.</p> <p>Along the length of the Thames and canals, engage people in the historic and natural heritage of the area.</p> <p>Conserve historic flood plain landscapes in order to preserve Scheduled Monuments located there and conserve species-rich historic flood plain grasslands. Manage water levels to avoid damage to natural and historic interests and soils, including during flood events and drought.</p>	<p><b>Sense of history</b></p> <p><b>Sense of place/ inspiration</b></p> <p><b>Recreation</b></p> <p><b>Biodiversity</b></p> <p><b>Regulating water flow</b></p> <p><b>Regulating soil erosion</b></p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Sense of history</b>  <i>Continued from previous page</i>		<p>Archaeology dates as far back as the Neolithic, with ancient field systems visible as cropmarks in the Thames gravels. Significant visible archaeological features include Roman roads such as Ermine Way and Saxon city defences at Wallingford and Cricklade. There are Saxon cemeteries and settlement at Fairford.</p> <p>Ridge and furrow dating back to medieval times survives across the area and includes nationally important examples. Around Aylesbury, deserted medieval villages are significant historic landscape features.</p> <p>On the upper reaches of the River Thames, at Sandford and Iffley, there are early examples of the first Pound Locks ever constructed in the British Isles. Radcot Bridge, north of Faringdon, is thought to be one of the oldest on the river and the site of a Civil War battle.<sup>24</sup> Other historic bridges include Wallingford, Abingdon and Dorchester. Historic flood meadows and ditch systems remain in some areas.</p> <p>Canal heritage includes locks and bridges, some of which have been restored.</p>		<p>Ploughing affects some scheduled monuments, including three Roman Villas in the Vale of White Horse and Cherwell districts as well as several ring ditches and settlement sites in South Oxfordshire and West Oxfordshire. Visitor erosion is a problem on the castle mound at Abingdon. Animal burrowing is affecting unmanaged monuments such as the airfield near Bicester and Dike Hills near Dorchester.</p> <p>Despite the proximity of archaeology in Port Meadow to Oxford, this Scheduled Monument is not on the At Risk Register. There are several Scheduled Monuments in the vicinity of the Cotswold Water Park where mineral extraction continues to take place.</p> <p>Canals are a focus for restoration as part of urban regeneration. Navigability remains an issue.</p> <p>As a rural area with limited development pressure, modern development has had little impact upon settlement pattern except near growth areas such as Aylesbury and Swindon.</p>	<p>Conserve the natural and historic features of historic parklands. Seek to restore the mosaic of land uses of the ancient Royal Hunting Forests where this will maintain sustainable food provision and boost biodiversity, sense of history and recreation. Protect parkland trees from plough damage.</p>	

<sup>24</sup> Thames Corridor Catchment Abstraction Management Strategy, Environment Agency (2004)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Tranquillity</b>	<p>Sparsely settled countryside</p> <p>Open water, including canals, rivers and water-filled gravel pits</p> <p>Urban green spaces</p>	<p>There has been significant decline in tranquillity since the 1960s – undisturbed areas have decreased from 71 per cent in the 1960s to 37 per cent in 2007.</p> <p>Experience of tranquillity is low near major urban centres such as Witney, Bicester and Aylesbury but also where settlements in adjacent NCAs extend such as Swindon and Oxford.</p> <p>The M4 and M40 are clearly corridors of noise but there are places where a dense network of A roads is negatively impacting upon tranquillity such as the Oxford-Kindlington-Bicester-Witney and Abingdon-Didcot-Wallingford-Thame-Aylesbury roads. Air traffic from Oxford Airport and military airfields just outside the NCA, for example Brize Norton and Fairford are also a source of noise.</p> <p>Beyond the major roads and urban centres, North Wiltshire and Aylesbury Vale provide the largest continuous areas of high tranquillity.</p> <p>The countryside offers opportunities to experience relative tranquillity for people living nearby in major urban centres such as Swindon, Oxford and Aylesbury. Within urban centres, green spaces including canals can offer relative tranquillity.</p> <p>Recreation activities can detract from experiences of tranquillity on rivers and lakes, such as water-skiing.</p>	Local	<p>Relative tranquillity is significant in this NCA, where the countryside and major urban centres such as Swindon and Oxford and motorway corridors are juxtaposed. There are recognised tourist destinations which increase vehicle and people traffic, for example, Thames and riverside settlements, Oxford Meadows, and Blenheim.</p> <p>Long views, sparse settlement patterns and flowing water are likely to enhance feelings of tranquillity in this NCA. Large areas are not recognised or promoted as tourist or recreation destinations, offering experiences of solitude.</p>	<p>Provide tranquil green spaces and recreation routes, particularly for people in major urban centres.</p> <p>Where possible, conserve the tranquillity of the river valleys and wetland as these are valuable tranquillity resources.</p> <p>Manage recreation activities on rivers and lakes to avoid negative impacts upon tranquillity, particularly in relation to noisy activities and busy locations.</p> <p>Ensure new development including transport infrastructure incorporates measures to minimise negative impact on tranquillity.</p>	<p><b>Tranquillity</b></p> <p><b>Biodiversity</b></p> <p><b>Recreation</b></p> <p><b>Regulating water flow</b></p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Recreation</b>	<p>Rights of way</p> <p>National Nature Reserves</p> <p>Watercourses and waterbodies including the Thames</p> <p>Thames Path and The Ridgeway National Trails</p> <p>Common land and village greens</p> <p>Woodlands</p> <p>Canals</p>	<p>There are around 3,400 km of rights of way, at a density of 1.78 km per km<sup>2</sup>. The Thames Path passes through this NCA over nearly 120 km and also a small part of The Ridgeway National Trail. The Oxford Canal Walk links with the Oxfordshire Way and is part of European long-distance path E2.</p> <p>There are two accessible NNRs – Chimney Meadows and North Meadow, Cricklade.</p> <p>The total area of open access land is 1,000 ha. Most is accessible to many people due to its location near Oxford. Around 320 ha of the NCA is common land and another 110 ha is designated village green. While not extensive, these green spaces are conveniently near to settlements. 43 ha is recognised a country park.</p> <p>Forestry Commission funded agreements make a substantial contribution to publicly accessible greenspace, with around 2,000 ha being under Woods for People or Walkers Welcome agreements. The Great Western Community Forest plays a role in this.</p> <p>There are informal access arrangements to many of the Oxford college grounds. Private estates open their grounds to paying visitors, for example Blenheim, which can also be accessed by public rights of way through it.</p> <p>The non-tidal River Thames is one of the most intensively used waterways in Europe. It is a prime recreation and leisure resource with large populations living nearby and many visitors. It is home to many recreation and leisure clubs. Canoeing, rowing, fishing, walking and cruising are particularly popular.<sup>25</sup></p> <p>The Oxford Canal and Grand Union Canal are recreation corridors providing for walkers, cyclists, anglers and boat users. The Wiltshire and Berkshire Canal is a focus for restoration and public access improvements.</p> <p>There are also many geocache sites.</p> <p>Water-filled gravel pits such as those in the Cotswold Water Park and in the Lower Windrush Valley offer a range of recreational opportunities</p>	Regional	<p>There is a wide range of recreation opportunities available, with the rivers, canals and water-filled gravel pits providing numerous water-based leisure opportunities. For example, over 500,000 people a year visit the Cotswold Water Park to enjoy a range of activities including bird watching, angling, water sports, walking and cycling. The Thames is a particular focus, drawing visitors from great distances. The grounds of the Oxford colleges and Blenheim Palace are also key attractions.</p> <p>Due to much of the countryside being managed for agriculture, there are few accessible green spaces and so recreation is very much restricted to linear routes, including footpaths and canals, which can offer a variety of opportunities. Woodland greenspace is significant in this NCA despite there being limited woodland cover.</p> <p>The distribution and proximity of greenspace in relation to major settlements varies across the NCA. Aylesbury and Bicester, for example, have large populations not well-served by green spaces. Oxford benefits from the grounds of the Oxford colleges and Oxford Meadows is a within short walking distance of the city centre.</p> <p>Major urban settlements such as Oxford, Swindon and Aylesbury as well as growing smaller towns such as Didcot, Witney and Bicester means that there is potential for high numbers of recreation users. This may give rise to deteriorating tranquillity, disturbance of wildlife and unsustainable erosion or trampling, for example, recreation has to be managed on the Oxford Meadows to avoid any negative impacts upon the SAC interest features.</p>	<p>Create green spaces within and around major urban centres, particularly where this dissipates visitor pressure away from the Oxford Meadows SAC. Design these to deliver multiple ecosystem services.</p> <p>Maintain the diversity of recreation opportunities available, from walking to water sports. Engage people in their heritage to enhance sense of place and sense of history, particularly in relation to Blenheim Palace, Oxford colleges, canals and the Thames Path.</p> <p>Continue to restore extraction pits to provide for sustainable recreation as well as geodiversity and biodiversity interests.</p> <p>Continue to restore canals and maximise sustainable public access to them, particularly in the proximity of urban centres.</p>	<p><b>Recreation</b></p> <p><b>Biodiversity</b></p> <p><b>Sense of place/ inspiration</b></p> <p><b>Sense of history</b></p>

<sup>25</sup> Thames Corridor Catchment Abstraction Management Strategy, Environment Agency (2004)



Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Biodiversity</b>	<p>Designated sites</p> <p>Lowland meadow</p> <p>Snake's head fritillary</p> <p>Wetland waders and waterfowl</p> <p>Marl lakes</p> <p>Native black poplar</p> <p>Black and brown hairstreak</p>	<p>Around 2,500 ha of the NCA is designated SSSI, comprising 1.3 per cent of the NCA. Of this, 52 per cent is in favourable condition and another 38 per cent is unfavourable recovering. 400 ha are also designated at a European level as three Special Areas of Conservation (SAC), while two National Nature Reserves provide access to rich biodiversity across approximately 90 ha.</p> <p>In addition, there are 355 Local Wildlife Sites amounting to 3 per cent of NCA area. 67 ha is designated Local Nature Reserve.</p> <p>This NCA has around 7,200 ha of flood plain grazing marsh, 1,700 ha of wet woodland and 1,300 ha of lowland meadows. Such habitats are restricted nationally. The reedbed at Otmoor is one of only 50 in the country greater than 20 ha. Rarer still are fens, of which this NCA contains 600 ha. There are also rich and extensive ditch systems around Otmoor, upper River Ray, and River Thames near Wallingford and in the Lower Windrush valley. There are significant pond complexes, for example in meadows adjacent to Farmoor Reservoir.</p> <p>North Meadow in Oxford is considered to be one of the best examples of lowland hay meadows and has the largest concentration of snake's head fritillary in the UK.</p> <p>Wetland habitat attracts regionally important numbers of breeding and wintering birds including snipe, redshank, curlew, golden plover and lapwing. Nationally important wintering wildfowl are associated with water-filled gravel pits, such as pochard and smew at the Cotswold Water Park.</p> <p>Nationally scarce marl lakes at the Cotswold Water Park support distinctive plant communities. The park provides a mosaic of open water, wetland and farmland habitats and supports a rich charophyte (stonewort) flora.</p> <p>The Cotswold Water Park and Aylesbury Vale are national strongholds for native black poplar. The Vale is also a stronghold for black and brown hairstreak butterflies.</p>	National	<p>In total, around 4 per cent of the NCA is designated for its nature conservation interest. There are 77 SSSI with an average size of 33 ha including numerous fens and meadows that are small and fragmented across productive farmland, legacy of a history of agricultural improvement, including drainage.</p> <p>Continued traditional management is carried out by the minority, including conservation organisations. There are, however, clusters of traditionally managed semi-natural grasslands along the river corridors which form the basis for a well-connected ecological network.</p> <p>Woodlands are also small and scattered across the landscape. These function in association with hedgerows and as part of the farmland mosaic of habitats.</p> <p>Water levels are more critical to wading birds than grassland species-richness so improved grasslands can have some biodiversity value if they are appropriately wet.</p> <p>The clusters of semi-natural habitat; the corridors of hedgerows, watercourses and ditches, and the farmland habitat mosaic can support a range of wildlife.</p> <p>Flowering meadows, particularly where the plants incorporate striking plants such as snake's head fritillary, readily engage people in their local greenspace.</p>	<p>Manage the three SAC and National Nature Reserves according to best practice. Secure multiple ecosystem services where they are compatible with the SAC and NNR designation.</p> <p>Manage historic grasslands, wetland and ancient woodlands to conserve soil structure and carbon content.</p> <p>Create a resilient and connected ecological network or habitat mosaic, beginning with the clusters of habitats along the river corridors. Manage these networks to regulate water flow through the landscape and manage features to filter pollutants and conserve soils.</p> <p>Manage recreation across green spaces so that people can engage sustainably with nature, especially in relation to avoiding disturbing breeding birds.</p> <p>Restore mineral extraction sites to boost biodiversity, strengthen sense of place and deliver other ecosystem services.</p>	<p><b>Biodiversity</b></p> <p><b>Climate regulation</b></p> <p><b>Regulating water flow</b></p> <p><b>Regulating water quality</b></p> <p><b>Regulating soil quality</b></p> <p><b>Sense of place/inspiration</b></p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Geodiversity</b>	<p>Designated sites</p> <p>Low-lying flood plains</p> <p>Extensive river system</p> <p>Undulating topography</p> <p>River gravel terraces</p> <p>Extraction pits</p> <p>Springline</p> <p>Marl lakes</p> <p>Traditional building materials</p>	<p>There are 11 geological SSSI and 27 Local Geological Sites.</p> <p>Low-lying clay flood plains are drained by a dense network of shallow gradient watercourses and ditches.</p> <p>Superficial deposits upon the clay create an undulating topography and comprise extensive river gravel terraces that evidence the evolution of the river system and contain ice age mammal remains and human artefacts. These deposits also represent a key minerals resource and there is a legacy of extraction pits, including over 100 lakes at the Cotswold Water Park.</p> <p>There are springlines where the Chalk of the Chilterns, Berkshire Downs and Marlborough Downs meets the clay vale. Limestone gravels from the Cotswolds also give rise to nationally scarce marl lakes at the Cotswold Water Park.</p> <p>Traditional building materials include Cotswold stone, 'clunch', brick and tile.</p>	Regional	<p>Geological SSSI include extraction pits. Exposures in abandoned pits are vulnerable to scrubbing over. There are community groups and landowners working to conserve designated sites and engage the public in geodiversity in this NCA.</p> <p>Wootton Bassett Mud Spring is a hydrogeological phenomenon represented by few other examples in Britain. The mechanism of the phenomenon has been studied in detail at this site.</p> <p>Fossil hunting activities are offered at the Cotswold Water Park.</p> <p>Local clay has given rise to brick as a local building material.</p> <p>Chalk and limestone in neighbouring NCAs gives rise to springlines, a marl lake system and building materials of Cotswold stone and Chilterns 'clunch'.</p>	<p>Manage and restore historic and new extraction pits to conserve geodiversity and provide traditional building materials, while also seeking to regulate water flow and enhance biodiversity.</p> <p>Create publicly accessible greenspace which allows people to engage with geodiversity and realise a sense of place.</p> <p>Support continued use of traditional building materials in order to celebrate local geodiversity and maintain sense of place.</p>	<p><b>Geodiversity</b></p> <p><b>Regulating water flow</b></p> <p><b>Biodiversity</b></p> <p><b>Recreation</b></p> <p><b>Sense of place/ inspiration</b></p>

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## Introduction

As part of Natural England's responsibilities as set out in the Natural Environment White Paper<sup>1</sup>, Biodiversity 2020<sup>2</sup> and the European Landscape Convention<sup>3</sup>, we are revising profiles for England's 159 National Character Areas (NCAs). These are areas that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries, making them a good decision-making framework for the natural environment.

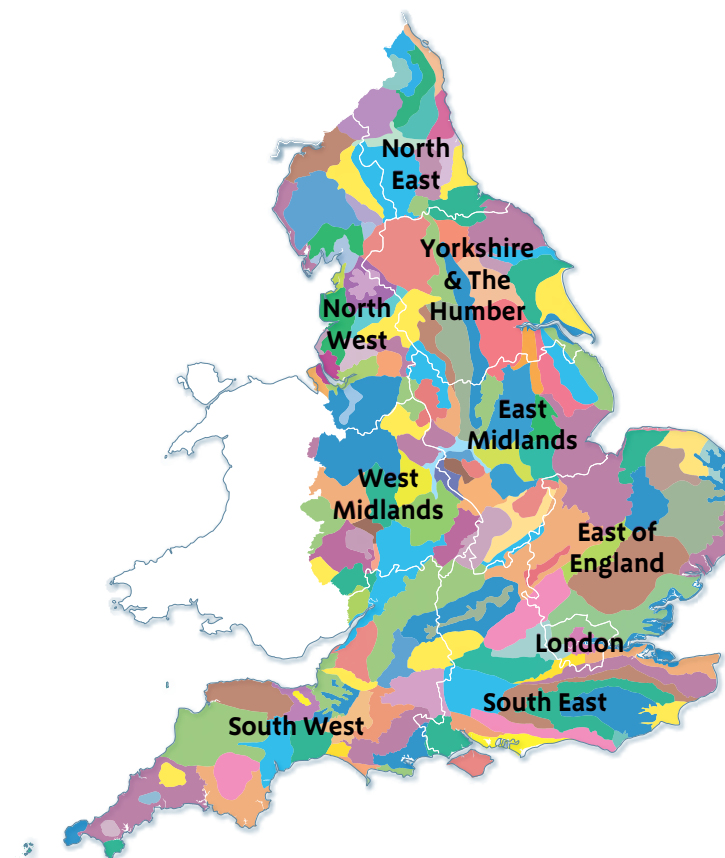
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and encourage broader partnership working through Local Nature Partnerships. The profiles will also help to inform choices about how land is managed and can change.

Each profile includes a description of the natural and cultural features that shape our landscapes, how the landscape has changed over time, the current key drivers for ongoing change, and a broad analysis of each area's characteristics and ecosystem services. Statements of Environmental Opportunity (SEOs) are suggested, which draw on this integrated information. The SEOs offer guidance on the critical issues, which could help to achieve sustainable growth and a more secure environmental future.

NCA profiles are working documents which draw on current evidence and knowledge. We will aim to refresh and update them periodically as new information becomes available to us.

We would like to hear how useful the NCA profiles are to you. You can contact the NCA team by emailing [ncaprofiles@naturalengland.org.uk](mailto:ncaprofiles@naturalengland.org.uk)

## National Character Areas map



<sup>1</sup> The Natural Choice: Securing the Value of Nature, Defra (2011; URL: [www.official-documents.gov.uk/document/cm80/8082/8082.pdf](http://www.official-documents.gov.uk/document/cm80/8082/8082.pdf))

<sup>2</sup> Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services, Defra (2011; URL: [www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-111111.pdf](http://www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-111111.pdf))

<sup>3</sup> European Landscape Convention, Council of Europe (2000; URL: <http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm>)



## Summary

The extensively wooded and farmed Chilterns landscape is underlain by chalk bedrock that rises up from the London Basin to form a north-west-facing escarpment offering long views over the adjacent vales. From the vales, the River Thames breaches the escarpment in the south at the Goring Gap and flows on past riverside towns such as Henley. Small streams flow on chalk down some of the dip slope valleys or from the scarp foot, passing through numerous settlements. The major sources of public water supply for the Chilterns and the London area are the chalk aquifer and the Thames.

The countryside is a patchwork of mixed agriculture with woodland, set within hedged boundaries. Furthest from London, the natural and built features of the countryside are recognised as special and attractive in approximately half the National Character Area (NCA) by the designation of the Chilterns Area of Outstanding Natural Beauty (AONB) and, in a small area south of the River Thames, by the North Wessex Downs AONB. Outside the AONBs there are major settlements that incorporate extensive urban fringe and growth areas, including Luton, Hemel Hempstead and High Wycombe. Motorways and railways make the area very accessible to visitors and connect the Chilterns to nearby London. Opportunities for residents and visitors to enjoy the outdoors are wide-ranging, including extensive rights of way; open access commons, woods and downland; Registered Parks and Gardens open to the public; golf courses; shooting estates; and urban green spaces. The Ridgeway and the Thames Path National Trails pass through the Chilterns, and the River Thames and Grand Union Canal are major water-based recreation corridors.

Human history dates back to the Palaeolithic, as evidenced by flint scatters. Farming of the valleys and escarpment began in the Neolithic and continues to this day as a major land use. Arable farming is concentrated on deep, well-drained soils found in the valleys, along the scarp foot and beneath the hills in the north. Nucleated settlements, often featuring historic buildings dating back to medieval times, are found in the valleys and along the scarp foot, as are the major routes. Chalk streams are found only in the main valleys and can be dry in their upper reaches.

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Above the valley floors, cultivation is made difficult by steep slopes, convoluted terrain and extensive clay-with-flint soils on the dip slope ridges. This has given rise to a diversity of land management practices throughout history, including mixed farming, woodland, extensively grazed downland and common land. Settlement on the plateau is characterised by dispersed farmsteads and villages linked by historic, small-scale routes including sunken lanes.



Walkers can enjoy an extensive rights of way network across farmland and woodland.

Today, common land and downland exist as fragments of their former extents. Commons are numerous across the plateau, providing green space near to people's homes. Historic downland is largely confined to the scarp and is strongly associated with prehistoric archaeology; its species-rich grassland and scrub include areas designated as a National Nature Reserve (NNR) and Special Areas of Conservation (SAC). Woodland cover accounts for 14 per cent of the NCA and makes the Chilterns one of the most wooded lowland landscapes in the country. Woods are found on poor agricultural soils, on commons and 'hanging' on steep slopes. A long history of a wood-based economy has helped to maintain many woodlands on ancient sites and generate rich woodland archaeology. More recently, local demand for wood fuel is helping to maintain the woodland resource. Chilterns NCA is renowned for its native beechwoods, a number of which are designated as SAC for their ecological interest.

Throughout the area, historic buildings and also some more recent constructions display locally distinctive uses of local materials, particularly brick and flint. Large mansions and follies are frequent in the countryside, many relating to Registered Parks and Gardens.



## Statements of Environmental Opportunity

- **SEO 1:** Manage the wooded landscape, the woodlands (including internationally important Chilterns beechwoods), hedgerows, commons and parklands with the aims of conserving and enhancing biodiversity and the historic landscape and its significant features; maximising the potential for recreation; and securing sustainable production of biomass and timber.
- **SEO 2:** In pockets of historic land use where natural and cultural heritage are both particularly rich, aim to restore and strengthen the historic landscape, ecological resilience and heterogeneity, and to conserve soils. Ensure that species-rich habitats are conserved and extended, including internationally important species-rich Chiltern downland. Secure environmentally and economically sustainable management to ensure conservation in the long term.
- **SEO 3:** Conserve the Chilterns' groundwater resource, River Thames and chalk streams by working in partnership to tackle inter-related issues at a catchment scale and also across the water supply network area. Seek to secure, now and in the future, sustainable water use and thriving flood plain landscapes that are valued by the public.
- **SEO 4:** Enhance local distinctiveness and create or enhance green infrastructure within existing settlements and through new development, particularly in relation to the urban fringe and growth areas such as Luton. Ensure that communities can enjoy good access to the countryside.



Remnant downland is rich with orchids and other flowering plants.

## Description

### Physical and functional links to other National Character Areas

Chilterns is one of several NCAs that make up an outcrop of the Chalk stretching from East Anglia to Dorset and to the South Downs. To the north-east, the Chiltern escarpment lowers into the East Anglian Chalk. In the south-west, the neighbouring escarpments of the Chilterns and the Berkshire and Marlborough Downs face each other across the Thames at the Goring Gap. From the north-west-facing escarpment, the Chilterns dip slope descends to the south-east into the London Basin, where the Chalk is overlain by younger bedrock.



The escarpment offers panoramic views across the vales and hills to the north-west.

Adjacent to the low-lying NCAs of Bedfordshire and Cambridgeshire Claylands and Upper Thames Clay Vales, the Chilterns scarp is prominent and offers panoramic views of the adjacent vales, principally Aylesbury Vale, from viewpoints such as Ivinghoe Beacon. Across the vales there is inter-visibility between Chilterns and other elevated NCAs such as Midvale Ridge and Bedfordshire Greensand Ridge.

From the northern end of the scarp, the rivers Flit and Ouzel (also known as Lovat) flow north onto the Bedfordshire and Cambridgeshire Claylands as part of the Anglian catchment. Along the remainder of the scarp, watercourses flow into the Upper Thames Clay Vales to feed the Thames catchment. The Thames flows from the Upper Thames Clay Vales through the Chiltern ridge at the Goring Gap to enter the London Basin.

Within the London Basin, the Chilterns' natural groundwater and surface water flows are linked to those of the wider basin which centres upon London and the Thames. These links are significant since the Chilterns function as the larger of the two principal aquifers in the basin (the other being the North Downs). Infiltration in the Chilterns supports groundwater levels and quality in London's confined aquifer and base flow in the Thames, which passes through the Thames Valley and inner London.

The Chilterns are linked into a modern transport network of motorways and railways radiating from nearby London. Outside London, major roads around Reading, Maidenhead, Slough and Aylesbury also link to the Chilterns. Long-distance historic routes that now function as key recreation corridors pass through the Chilterns: the Grand Union Canal, the Thames and the Ridgeway.

### Distinct areas

- Thames Valley



## Key characteristics

- The chalk plateau is incised by parallel branching valleys gently shelving to the south-east into the London Basin. The large chalk aquifer is abstracted for water to supply London and its surrounds and also supports flows of springs, chalk streams and the River Thames.
- There are several chalk streams. Features associated with a history of modification include historic mills, watercress beds, culverts and habitat enhancements.
- The north-west-facing escarpment is an abrupt relief feature beside low-lying vales, breached notably by the Thames at the Goring Gap. The escarpment lowers northwards, terminating as distinct hills. The Chiltern ridge offers panoramic views.
- Within the Chilterns, views are enclosed within branching valleys, sunken routeways and extensive woodland and hedgerow-enclosed fields. There are hidden, tranquil pockets along single track lanes and rights of way.
- A mixture of arable, grassland and woodland and the numerous commons reflects the dominance of Grade 3 agricultural land. Ancient woodland has remained on extensive clay-with-flint deposits, while very steep slopes are rarely cultivated. There are, however, not inconsiderable areas of Grade 1 and 2 land that are associated with lower-lying areas and river valleys.
- The Chilterns are one of the most wooded lowland landscapes in England. The area is particularly renowned for its extensive native beechwoods, several of which are designated as part of the Chilterns Beechwoods Special Area of Conservation (SAC). Other distinctive features include rare box woods, 'hanging' woods on steep slopes and rare yew woods, including Hartslock Wood SAC.



The River Thames offers a variety of recreation opportunities, particularly as it passes through towns fronting the river such as Marlow shown here.



## Key characteristics continued

- Pre-18th-century fields defined by ancient, often sinuous hedged boundaries are scattered throughout, including co-axial fields. Parliamentary enclosure fields are limited. Large modern fields, usually with ancient boundaries, cover the better agricultural land, most notably in the north-east.
- Remnants of various historic land use types can combine rich and diverse habitats and archaeology. Many key places are publicly accessible, including Registered Parks and Gardens, historic downland and common land. Traditional flood plain landscapes and orchards are the most restricted in extent. Historic routeways, hedged boundaries and watercourses provide connectivity.
- Historic downland preserves prehistoric archaeology and supports high numbers of rare and scarce chalk grassland vascular plants, mosses and liverworts. Diversity is enhanced by a mosaic of chalk grassland, scrub and woodland, with Hartslock Wood SAC being one example.
- Species strongly associated with the Chilterns include the red kite, pasque flower, stag beetle, Chiltern gentian, shepherd's needle, chalkhill blue butterfly and native box. Aston Rowant SAC protects an internationally important juniper scrub population. Farmland birds and deer are a feature of the wider countryside.
- Nucleated settlements of medieval origin and land farmed since prehistory are found alongside watercourses and springs in the through-valleys and at the foot of the scarp. Elsewhere, dispersed farmsteads dating from the medieval period and mid-19th-century development around commons are characteristic of the plateau.
- The River Thames and its flood plain mark a distinctive area in the south. The river is a focus for settlement, abstraction and recreation.
- Major transport routes, including motorways, radiate from adjacent Greater London, associated with significant 20th-century development and extensive urban fringe areas.
- Brick and flint are the dominant traditional building materials, with Totternhoe Stone (clunch) being less common, but still a distinctive
- Numerous parkland landscapes define large, historic estates. Designs by Humphry Repton and Lancelot 'Capability' Brown are represented, and the houses, follies and wooded features provide local landmarks.
- Extensive rights of way, commons, open access downland, woodland and some parklands provide access to the countryside. The Thames Path, the Ridgeway and the Grand Union Canal are high-profile recreation routes; locally promoted routes include the Chilterns Cycleway. Private leisure land uses, including golf courses and horse paddocks, are common near urban centres.

## Chilterns today

The Chilterns are a distinctive outcrop of the Chalk, with a dramatic scarp forming the north-western boundary. From the long, north-west-facing scarp there are extensive, panoramic views over the adjacent vales. The dip slope, with the character of a plateau, falls gently to the south-east, cut by a series of branching valleys. The enclosed character of the valleys contrasts with the open plateau and long views from the scarp. Rising to just above 260 m, the hills stretch from the Thames in Oxfordshire at their south-western point, across Buckinghamshire and Hertfordshire to Bedfordshire in the north-east. The area includes the lower-lying substantial settlements of Luton, Dunstable, Hemel Hempstead, Berkhamsted, Chesham, Amersham and High Wycombe, as well as sections of the M40 and M1 motorway corridors. The south-western boundary is formed by the River Thames as it flows past Wallingford, Reading, Henley and Marlow. Although part of the Chilterns, this belt of countryside is dominated by the river and its flood plain rather than by the hills.

While many of the dip slope valleys are dry, there are several chalk rivers flowing through others, such as the Chess. Springs and watercourses also issue from the foot of the scarp, such as the Ewelme Brook. Many of the watercourses are 'bournes' or 'winterbournes', which dry up near their source when groundwater levels are low. Many chalk streams receive treated discharges, often to counter low flows caused by abstraction. The presence of accessible and reliable water sources has determined, in large part, the location of settlement, including major urban centres. Canalisation, relict watercress beds, mills, sewage treatment works, habitat enhancements and riverside green spaces catalogue a history of use and modification and the significance of water in a chalk landscape.

The countryside of the Chilterns combines mixed agriculture with numerous woodlands and hedgerow boundaries that are often ancient. Steeper ground is often characterised by small fields, and there is a notable concentration of pre-18th-century fields, including assarts and co-axial fields, in the Buckinghamshire and Oxfordshire parts of the NCA. There are localised concentrations of arable production in the north, around Luton, and in the 'Ipsden prairie' of Oxfordshire. Livestock farming is dominated by sheep and cattle and, across the remaining fragments of historic downland, grazing



The nucleated village of Fingest lies in a valley. Woodland cover is considerable and sheep graze the grasslands.



Large flocks of red kites are common.

animals help to conserve open grassland. Meadows remain alongside watercourses but are rarely traditionally managed. Cherry orchards, once a widespread feature of the central part of the NCA, are now encountered only occasionally. Farmland supports a wide range of birds, including corn bunting, yellow hammer and grey partridge, and also arable weeds, such as prickly poppy and shepherd's needle.

Woodland cover is extensive, making the Chilterns one of the most wooded lowland landscapes in England. Large woods, dominated by beech, are found on the plateau and as 'hanging' woods above the valleys; there are also small farm woodlands. Secondary woodland can be found on once-open common land and downland but, elsewhere, many woods are ancient. Chilterns beechwoods are renowned for 'cathedral-like' qualities and bright autumn colours, and their importance is recognised through SAC designation. Local variations include the very rare natural box woods that occur on the scarp, as well as mosaics of habitats such as at Hartslock Wood SAC, which includes a species-rich area of chalk downland within a mosaic of beech and yew woodland. Soaring above the woods and valleys, the distinctive forked tail of the red kite is now a common sight. Deer are often glimpsed in woodlands and fields.

Remnant areas of heathland, acid grassland and wood pasture are scattered across the plateau, often associated with common land and parkland on low-fertility agricultural soils. The scarp and some dry valley slopes are characterised by fragmented areas of species-rich chalk grassland with scrub. Colourful flowers are a feature of these grasslands during spring and summer and include the rare Chiltern gentian, pasque flower and a number of orchids. Butterflies, including the restricted Duke of Burgundy and chalkhill blue, can also be spotted. There are also a few small areas of rare chalk heath.

Aston Rowant SAC features an internationally important juniper population. Dispersed farmsteads and hamlets are found on the high plateau, with nucleated towns and villages in valleys and at the foot of the scarp. Some linear villages dating from the mid-19th century occur on the plateau, usually associated with common land. Many lower-lying settlements contain historic centres, often dating back to the medieval period. St Albans contains remains of the major Roman town of Verulamium. Historic, and some modern, buildings use local, traditional materials, including flint, brick, clay tiles and occasionally thatch. Clunch, an impure and harder form of chalk, is sometimes used as a highly distinctive building material. Designed parklands and gardens make a dramatic contribution to the area, with follies and grand houses often located in prominent positions and featuring other distinctive attributes such as tree avenues and gatehouses. A number of landscaped parklands and gardens are the work of famous 18th-century designers such as Bridgeman, Brown and Repton.

Major roads and railway lines follow the valleys cutting through the escarpment, linking London and the Midlands. Settlements along main routes have expanded considerably during the 20th century, with major urban centres found near motorways at Luton and High Wycombe. There is also an airport near Luton. Business and industrial parks adjacent to watercourses are often located on the sites of former mills. Ancient, often sunken lanes can be found beyond the network of major routes, some running straight along valley bottoms or ridgetops and others winding up the scarp or valley sides. Away from main settlements, roads and railways are areas with high levels of tranquillity, many associated with concentrations of well-preserved prehistoric monuments, including bronze-age burial mounds and iron-age hill forts and dykes.

With a large population in or near the area, demand for recreation has generated a considerable number of golf courses, horse paddocks and managed public green spaces near settlements. Numerous parklands and woodlands are also open to the public, alongside the designated open access commons and downland. The Thames Path and the Ridgeway National Trails pass through the area. Boating is popular on the River Thames, and horse riding, walking and cycling are supported by an extensive rights of way network that includes locally promoted routes such as the Grand Union Canal, the Chilterns Cycleway and the Icknield Way Riders' Route. Easy access has resulted in some busy 'honeypot' sites, such as Ashridge, with accompanying, prominent visitor facilities – car parks, information panels and signage.

Overall, the countryside has a predominantly quiet and prosperous farming and estate character, and the scenic qualities in the half of the NCA furthest from London are recognised by their Area of Outstanding Natural Beauty (AONB) designations.



## The landscape through time

The NCA is defined by a Chalk outcrop that formed between 95 and 70 million years ago during the Upper Cretaceous. Deposits on the bed of warm, shallow, lime-rich seas built up over Upper Greensand and Gault Clay to create distinct bands of chalk recording changing conditions. They contain marine fossils, including ammonites. Massive earth movements 60 to 40 million years ago during the Palaeogene tilted the Chilterns and the wider area into a downfold to form the London Basin. High on the northern rim of the London Basin, the Chilterns were exposed to erosion, causing a reduction in the height and westward extent of the Chalk. During the Quaternary, ice sheets overrode the outcrop in the north, lowering the escarpment and blocking the passage of the Thames through the Vale of St Albans. The Thames, forced southwards, carved its gorge through the escarpment at Goring and shaped its gravel deposits into terraces. Upon the frozen ground of the dip slope, water could not percolate into the Chalk and so carved branching valleys down into the London Basin, eroding as deep as the Melbourn Rock in the main valleys. Various Quaternary deposits were laid down on the Chalk, the most extensive being clay-with-flint deposits, which were created through disintegration of upper chalk bedrock by freeze-thaw action.

Quaternary deposits are associated with the earliest humans in the Chilterns. Extensive flint-working sites at Caddington and the largest Palaeolithic hand axe in Britain – and probably Europe – have been dated to the early Palaeolithic. Finds of Mesolithic flint implements are widespread.

Monuments, boundaries and tracks remain visible today as tangible evidence of prehistoric people in the Chilterns. The oldest monuments, for example the long barrow overlooking Princes Risborough, date from the Neolithic. The Bronze Age is largely represented by burial mounds, while iron-age monuments consist of simple hill forts, such as Pulpit Hill, and dykes – earth boundaries – including Grim's Dyke. There is a notable concentration of iron-age defensive features commanding prominent hills overlooking key routes such as the Thames, the Ridgeway and the Icknield Way.



Country mansions, follies and parkland are frequent across the Chilterns. West Wycombe mausoleum occupies a prominent position in the valley.



The management of woodland for a range of products or to release land for agriculture defines much of this landscape. Farming in the Chilterns began in the Neolithic when woods were cleared along the scarp and river valleys. Favourable farmland in the valleys and along the springline attracted late iron-age settlers. Existing farmsteads were later adapted into Roman villas. Thriving Roman markets, such as Verulamium (now St Albans), and a growing population encouraged farmers onto marginal soils, evidenced by the remains of Roman farmsteads and fields, many of which are now preserved under woodland. Verulamium was connected to London by Watling Street through the Ver Valley – now the modern A5 – and to the west by Akeman Street following the Bulbourne Valley – now the A41. Charcoal produced from the extensive woodlands was an important resource for the Roman iron smelting industry in the area.

In contrast to the more productive valley and scarp foot soils, the marginal agricultural land of the plateau lent itself to woodland and rough grazing. Minor droveways developed linking the vales to the plateau. Saxon estate boundaries, many still discernable today, indicate the equal apportionment and distribution of resources of clay vale, springline, chalk escarpment and wooded plateau. The marginal nature of growing conditions on the plateau made farming sensitive to phases of reclamation and abandonment. Population declines and a collapse in agricultural markets in the 5th and 6th centuries led to abandonment to rough grazing and woodland. By the time of Domesday in 1085–86, woodland had spread to exceed today's cover.

'Manorial wastes' were established between the 10th and 13th centuries across the plateau, often linked together by thin tracts of land. Commons developed providing small centres for industry, producing bricks, tiles and lime, and were used for occasional grazing, providing firewood and places for local gatherings.

The 12th century saw another period of population growth and 'land hunger' driving renewed woodland clearance to allow cultivation, and the establishment of farms and settlement. Some steeper slopes were cultivated for the first time. Medieval assarts and strip lynchets provide evidence of intense agricultural activity in the Chilterns during this period. Monasteries, such as Missenden Abbey, were also accumulating land into large estates and establishing priories. Clearance of common woods slowed towards the end of the 13th century.



Sunken routeway through beech woodland.

Despite increased demands for farmland, the value of woodland produce and the low fertility of some areas were sufficient to ensure the retention of substantial areas of woodland. In the 13th century, the demand from the adjacent vales for timber and firewood made Chilterns woodlands valuable and stemmed the steady clearance that had begun in the preceding century. Many wooded commons were enclosed as private property, and further woodland was enclosed in parks.

Tudor population increases instigated resurgence in clearance for agriculture, which included enclosing common heaths. Woodlands in the south were saved from clearance by London's demand for firewood and timber, combined with their proximity to the Thames shipping route.

Since 1600, approximately 12,000 ha have remained under continuous woodland cover, assisted in the 18th and 19th centuries by the demand from the local furniture industry for beech timber. This grew from its 'cottage industry' beginnings to a nationally recognised, large-scale industry known for the 'Windsor' chair. This industry drove widespread planting of beech and the conversion of many semi-natural mixed woods into beech woodland. Coppice for charcoal was devalued by the opening of the Grand Union Canal, which made coal more readily available. Secondary woodland cover also increased. Ancient woodlands were extended, particularly in Oxfordshire, and the agricultural depression of 1880 to 1940 led to the scrubbing up of downland and commons, including Totterhoe and Naphill.

Further change in the 18th and 19th centuries was associated with agricultural improvements involving Parliamentary enclosure of commons and the re-organisation of farm and older boundaries. Some commons were lost entirely, including Wycombe, while others, such as Berkhamsted,

survived intact. The Chilterns, within easy travelling distance of London, also became a focus for the wealthy, who established grand houses and fashionable parks and gardens. Many had earlier antecedents as hunting parks but were substantially remodelled or expanded. Designed landscapes include examples by Lancelot 'Capability' Brown and Humphry Repton. Many large estates survive, having diversified to include schools, tourist attractions and shooting estates.

Water-powered mills, which first appeared during medieval times, gradually increased in number, but it was not until the 19th century that the paper industry reached an industrial scale along the Wye and Gade. At a similar time the Chilterns became famous for their apples and soft fruit, with orchards surviving, particularly around the 'cherry pie villages' of Seer Green and Holmer Green.

The 19th century saw the first deliberate construction of transport networks since Roman times. Turnpike trusts improved all the main routes running along the through-valleys. The Grand Union Canal, railways (including three London mainlines) and motorways followed. The effect of improved connections with the capital was dramatic, leading to development of light industry and suburbs. This is most clearly seen in the 'Metroland' suburbs along the Metropolitan Line, which were promoted to commuters as accessible rural retreats away from the city. With suburbanisation came an increase in recreational land use, with areas of downland converted to golf courses, such as near Luton and Dunstable.

Many towns and villages have retained their historic core, with notable medieval buildings and Norman churches, but many have expanded substantially. Settlements on the plateau have more recent origins in the

19th century. Luton was targeted for growth as an early 'new town' and remains a focus for growth. Old mill sites along chalk streams have been redeveloped as business and industrial estates. Three industrial-scale cement works extracted material from the scarp in the 20th century but have subsequently closed.

In the countryside there has also been recent change. Post-war enlargement of fields by hedgerow removal saw the creation of some prairie fields, particularly concentrated in Hertfordshire and Bedfordshire. Across the commons and downs, the continuing decline of livestock farming led to further significant areas of open land being lost to scrub and woodland. Traditional grazing and clearance of scrub became a conservation activity. The woodland resource also fell out of management with the demise of the local furniture industry, although increasing local demand for wood fuel in recent years has incentivised management in some woods. Farms have evolved to include increasing numbers of 'hobby' farms and historic farm buildings converted to dwellings and offices. In the face of change, the scenic qualities and natural beauty of the countryside furthest from London have been conserved by AONB designations: the Chilterns AONB to the north of the Thames (designated in 1965) and the North Wessex Downs AONB to the south of the Thames (designated in 1972).

## Ecosystem services

The Chilterns NCA provides a wide range of benefits to society. Each is derived from the attributes and processes (both natural and cultural features) within the area. These benefits are known collectively as 'ecosystem services'. The predominant services are summarised below. Further information on ecosystem services provided in the Chilterns NCA is contained in the 'Analysis' section of this document.

### Provisioning services (food, fibre and water supply)

- **Food provision:** As a result of the predominance of Grade 3 agricultural land, farming is mixed, with average levels of productivity. There is a concentration of arable production on Grade 1 and 2 land along the Thames Valley, beneath the hills in the north and along the scarp foot. Cereals dominate arable production, with wheat being a predominant crop. There are limited but well-established sheep farms and localised areas of dairy and beef production.
- **Water availability:** The Chalk is the most significant aquifer of southern England and is of national importance in terms of abstracted volume and development for abstraction. Groundwater abstraction volumes far outweigh those from surface waters in the Chilterns, with much of it being for public water supply. A large and growing population combined with high consumption rates per person put significant demands on the resource. Chilterns water resources also support London's groundwater supplies in the confined aquifer and the Thames river system downstream of the Chilterns. Unsustainable abstraction currently takes place in the north of the Chilterns, where the rivers Ver, Misbourne, Mimram and Lee are considered to be over-



abstracted and hence experience low flows exacerbated by abstraction pressures. There is hydraulic continuity between the aquifer and watercourses, which means that changes in groundwater levels directly affect surface water levels. The Thames is relatively resilient to abstraction but alleviation schemes and monitoring have been required for the Chilterns' small chalk streams to address negative impacts of low flows on valued biodiversity.

- **Biomass energy:** The extensive woodland cover represents a source of wood fuel, particularly since timber quality is limited in the immediate future. The market for firewood is growing significantly in parts of the Chilterns. The potential for miscanthus is limited and there have been very few plantings. Short rotation coppice coverage is minimal and is discouraged in areas such as the Chilterns where there are water availability concerns.



The Chilterns countryside is accessible to many people along major road and rail links radiating out from London. The M40 passes through Aston Rowant National Nature Reserve.

## Regulating services (water purification, air quality maintenance and climate regulation)

- **Climate regulation:** Across most of the NCA, carbon stored in the topsoil horizon is typically in the range of 0–5 per cent, which is good for mineral soils in agricultural use. The considerable area of undisturbed soils beneath remnant historic land uses such as ancient woodlands and downland represents a large, longstanding carbon store with maximised storage capacity. The extensive tree cover also sequesters carbon, although trees make a greater contribution to carbon reduction by providing alternatives to fossil fuels.
- **Regulating water quality:** Since the Chalk aquifer is nationally important for water supplies and chalk stream biodiversity is influenced by water quality, pollution is a concern across the NCA. Nitrate concentrations in groundwater exceed drinking water standards at points across the Chilterns and appear to be rising in some areas. Steep slopes increase rates of run-off, potentially increasing the movement of sediment and chemicals from cultivated or damaged soils into watercourses. Catchment sensitive farming measures are being promoted across some catchments, with a particular focus in the north. A dense hedgerow network, extensive woodlands and permanent grasslands will contribute to trapping mobile soils and pollutants and to slowing rapid run-off. Point sources of pollution are also associated with settlements and highways, such as High Wycombe, Luton and Dunstable. Extensive settlement entails numerous sewage treatment works, which pose pollution risks.

- **Regulating water flow (flooding):** The Thames Valley has a fairly high risk of flooding, with riverside settlements including Reading, Henley and Marlow susceptible. The Thames Valley also offers potential floodwater storage areas. Smaller-scale flooding may also affect those settlements adjacent to chalk streams in the dip slope valleys but, historically, low flows have been a more significant issue, with natural flows needing to be artificially supplemented in many cases. Natural river processes are often constrained by channel modifications in urban and developed areas, for example canalisation in Luton and High Wycombe.
- **Regulating soil quality:** Agricultural opportunities are optimal across the Grade 1 and 2 land found in valley bottoms, along the scarp foot and in other lower-lying areas. Historic land uses with a long history of low or zero chemical input and limited or no cultivation, including traditionally managed downland, parkland and ancient woodland, represent areas of soil that have benefited from a long continuity of conservation practices and natural soil processes. Soil quality is at risk across much of the NCA due to compaction. The role of soil quality in water filtration to the aquifer and water pollution is of significance to groundwater quality in the Chilterns' principal aquifer and to the biodiversity of chalk streams.

## Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration:** Landscape character ranges from enclosed and intimate folded valley landforms to the exposed plateau tops and scarp that afford extensive views, with the separate character of the Thames flood plain to the south. The unifying elements include sunken lanes, woodland, downland, chalk streams, parkland and a distinctive vernacular architecture. Red kites are now a common sight adding to sense of place. Prominent

landmarks include grand houses and follies (as at West Wycombe), chalk figures (such as Whiteleaf Cross) and monuments (such as Coombe Hill Monument). The undeveloped commons and dry valleys evoke a sense of rural endurance, particularly when contrasted with nearby London and its fringe. The Chilterns landscape inspired John Milton, Stanley Spencer<sup>4</sup>, John Nash<sup>5</sup> and Roald Dahl. Properties owned by key historic figures include Benjamin Disraeli's country estate, Hughenden Manor, and the Rothschild family's Natural History Museum at Tring.

- **Sense of history:** Extensive flint-working sites and finds date from the early Palaeolithic Period. The prehistoric routeways of the Ridgeway and the Icknield Way and associated prehistoric monuments create a particularly strong sense of prehistory along the escarpment. Roman influence on the landscape is still evident, primarily through the communications network and settlement pattern. Many villages, farmsteads and field patterns are of medieval origin, including rare co-axial fields. Commons and woodlands rich with archaeology are widespread. Historic buildings and more recent constructions make use of traditional materials such as flint, brick, and tiles and, in places, weatherboard and thatch. Designed parklands and large gardens are prominent, covering 3 per cent of the area, and many are included on the national Register of Historic Parks and Gardens. There are examples by key landscape designers such as Brown and Repton. More recent heritage features include the Grand Union Canal and the 'Metroland' towns along the London Underground Metropolitan Line.

<sup>4</sup> URL: [www.chilternsaonb.org/about-chilterns/people-and-history.html#1325](http://www.chilternsaonb.org/about-chilterns/people-and-history.html#1325)

<sup>5</sup> URL: [www.chilternsaonb.org/about-chilterns/people-and-history.html#1345](http://www.chilternsaonb.org/about-chilterns/people-and-history.html#1345)



- **Tranquillity:** Contrasting with nearby London, this area offers relative tranquillity. Tranquillity is found along parts of the escarpment but the largest area is found in the remote and sparsely settled dip slope in Oxfordshire. Transport corridors, such as the motorways, and aircraft impact negatively on tranquillity in localised areas.
- **Recreation:** A variety of green spaces and an extensive rights of way network offer a range of recreation opportunities suitable for walkers, horse riders and cyclists, as well as for those who enjoy less common pursuits, such as carriage drivers and paragliders. Improvements have also been made to increase accessibility for disabled users. Long-distance trails include the Ridgeway and the Thames Path National Trails, and the Chiltern Way. There are more than 3,500 ha of open access land, around 2.5 per cent of the NCA, including significant tracts of common land close to settlement. There are three National Nature Reserves (NNRs) that provide access to some of the best examples of semi-natural habitats in the country and a particularly large area of accessible woodlands. Green space is well distributed except in the north, where Luton, for example, is noticeably lacking.
- **Biodiversity:** The approximate area of priority habitat amounts to just over 16,000 ha, of which the huge majority is woodland and includes the Chilterns Beechwoods SAC. Fragments of lowland calcareous grassland total more than 700 ha<sup>6</sup> and include Barton Hills and Knocking Hoe NNRs. Chiltern chalk grasslands are distinctive for their large number of rare and scarce vascular plant species such as the Chiltern gentian. At Hartslock Wood SAC and Aston Rowant SAC, there are important examples of the Chilterns' mosaic of chalk grassland, scrub and woodland. Site of Special Scientific Interest (SSSI) designation protects more than 3,600 ha of habitat and Local Wildlife Sites a further 12,647 ha. In addition, there are undesignated chalk streams and parklands. The area is popularly known for its numerous red kites.
- **Geodiversity:** The Chalk outcrop of the Chilterns filters and stores large quantities of high-quality potable water, making it a principal aquifer. The Chalk produces water that is naturally mineral rich, sediment free and of a stable temperature and as such supports specialised chalk stream ecology. In the Thames Valley, large flood plain terraces create a distinct landform and comprise a valuable aggregate resource. Buildings have made use of Chiltern flint; a particular form of hard chalk called 'clunch' or Totternhoe; a conglomeration of flint and pebble called puddingstone; and red brick made from local clays<sup>7</sup>. Of the 14 SSSI designated for their geological interest, many are small-scale historical sites of mineral extraction, including brickworks, sand pits, gravel pits and chalk pits. There are 33 Local Geological Sites.

<sup>6</sup> Chilterns Area of Outstanding Natural Beauty: Management Plan 2008 - 2013 – A Framework for Action, Chilterns Conservation Board (undated)

<sup>7</sup> Chilterns Building Design Guide, Chilterns Area of Outstanding Natural Beauty (February 2010, second edition)

## Statements of Environmental Opportunity

**SEO 1: Manage the wooded landscape, the woodlands (including internationally important Chilterns beechwoods), hedgerows, commons and parklands with the aims of conserving and enhancing biodiversity and the historic landscape and its significant features; maximising the potential for recreation; and securing sustainable production of biomass and timber.**

**For example, by:**

- Planning for landscape restoration, creation and enhancement activities with reference to the special qualities of the Chilterns Area of Outstanding Natural Beauty (AONB) and North Wessex Downs AONB.
- Building on existing stakeholder groups and strategies involved in woodland conservation including, for example, AONB management plans and county green infrastructure strategies.
- Working across administrative boundaries to develop a resilient ecological network that supports wooded habitat and species.
- Bringing as many wooded features as possible into appropriate management, drawing support from woodland grant schemes and agri-environment schemes. Restore management to those woodlands that have fallen out of management, particularly those with already poor woodland structure, declining timber prospects and deteriorating visitor infrastructure. Secure sustainable management in all cases.
- Seeking to secure woodland and tree health in the long term. Maintain and enhance a heterogeneous woodland resource to ensure that it is resilient to climate change and to pests and diseases such as ash dieback. In existing woodlands and in new plantings, allow for positive species composition changes and maintain woodland on varying terrain, soils and aspect. Conserve the genetic diversity of the woodland resource.
- Co-ordinating deer population management across ownership boundaries. Protect woodlands and trees from deer damage as appropriate. Restore key woodlands and other wooded features that have been severely damaged by deer and squirrels, including important beech woodlands.
- Monitoring impacts of climate change, pests and diseases on native beechwoods, including the Chilterns Beechwoods Special Area of Conservation (SAC), and implementing appropriate adaptation and mitigation strategies. Recognise and conserve all habitats and species of principal importance, including those within SAC, Sites of Special Scientific Interest (SSSI) and Local Wildlife Sites. Restore and conserve all native beechwood types and conserve other semi-natural woodland types that are less extensive than the beechwoods.
- Identifying current and future threats to wooded features in the Chilterns and reviewing ecological, historic and landscape designations to ensure that there is appropriate protection of the range of wooded features. Consider ecological designations for parklands, orchards and hedgerows in particular. Consider Tree Preservation Orders in relation to 'landmark' and veteran trees.

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**SEO 1: Manage the wooded landscape, the woodlands (including internationally important Chilterns beechwoods), hedgerows, commons and parklands with the aims of conserving and enhancing biodiversity and the historic landscape and its significant features; maximising the potential for recreation; and securing sustainable production of biomass and timber.**

**For example, by:**

- Maintaining woodland on ancient woodland sites and conserving ancient hedgerow boundaries. Conserve ancient trees and veteran trees, planting or identifying nearby successors in order to secure the deadwood resource and associated biodiversity in the long term. Continue restoration of Plantations on Ancient Woodland Sites.
- Conserving the diverse arrangements and particular species compositions of wooded features in designed landscapes, incorporating native and exotic species in avenues, groves, belts, shrubberies and so on. Carry out historic landscape character assessments and devise management plans to inform conservation efforts. Ensure that succession planting respects the original plantings and seeks to maintain the historical continuity and sense of place. Target Registered Parks and Gardens, particularly those 'at risk', but also consider parklands of local importance and 'landmark trees'.
- Managing all wooded features to benefit biodiversity, considering the needs of woodland species including woodland butterflies, birds and deadwood invertebrates.
- Conserving and recording archaeology in ancient and secondary woodland. Draw on best practice developed by, for example, the Chilterns AONB and North Wessex Downs AONB.
- Using historic landscape information to engage the public in discussion about change in the landscape, particularly in relation to tree clearance and scrub management on once-open common land and downland.
- Drawing on best practice developed by, for example, the Chiltern Woodlands Project, to ensure appropriate management of woodlands across the Chilterns.
- Drawing on the best practice example of the Chilterns Special Trees and Woods Project to engage the public in recording and celebrating wooded features beyond the Chilterns AONB. Focus such efforts in green spaces and along routes that are publicly accessible. Manage and enhance field boundaries and small woodlands as connections in the woodland network and also as part of a diverse habitat mosaic. Plant hedgerows where there is poor connectivity, particularly where this will also restore historic boundaries. Manage large, species-rich woodlands, such as the Chilterns Beechwoods SAC, as core areas in the ecological network. Focus particularly on conservation of ancient hedged boundaries and ancient woodlands in order to secure their high species richness.
- Conserving historic boundary features, including veteran trees, and creating optimal edge habitat along the woodland or boundary edge.

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**SEO 1: Manage the wooded landscape, the woodlands (including internationally important Chilterns beechwoods), hedgerows, commons and parklands with the aims of conserving and enhancing biodiversity and the historic landscape and its significant features; maximising the potential for recreation; and securing sustainable production of biomass and timber.**

**For example, by:**

- Planning clearance of secondary woodland where it would restore species-rich and fragmented open habitats and restoring key views and historic landscapes. Due to the sensitivities of tree clearance and major landscape change, undertake this work in partnership with local stakeholders. Ensure that historic features are not negatively impacted by clearance. (Open habitats include grassland and heathland in downland, common land, farmland and flood plain settings.)
- Strengthening and developing new local markets for 'local', 'sustainable', 'traditional' woodland products, including wood fuel, which delivers climate regulation benefits.
- Managing the woodland resource to accommodate and drive appropriate woodland-based recreation activities that generate an income to support suitable woodland management. Draw from existing successful examples such as the visitor attractions at Wendover Woods and at Aston Hill Bike Park, the mountain bike course at Halton. Promote and manage demand for recreation to avoid unsustainable visitor numbers, recognising that recreational uses are not appropriate in some woodlands.
- Managing visitor pressure and forestry impacts on the woodland's ecological and historic environment features.
- Strengthening and enhancing multi-user access links between settlements and woodlands, facilitating greater community stewardship of local green spaces. Prioritise access to woodlands near to people's homes and workplaces, creating new woodlands where appropriate.
- Managing small woods associated with farmland as part of the wider ecological network and as a resource that can be managed to provide small-scale products of value to the farmer. Secure buffers in farmland adjacent to woodlands, veteran trees and hedgerow boundaries, particularly where high chemical input and deep ploughing is undertaken.
- Creating new forestry infrastructure that makes sustainable woodland management more viable, such as rides and sawmills.

**SEO 2: In pockets of historic land use where natural and cultural heritage are both particularly rich, aim to restore and strengthen the historic landscape, ecological resilience and heterogeneity, and to conserve soils. Ensure that species-rich habitats are conserved and extended, including internationally important species-rich Chiltern downland. Secure environmentally and economically sustainable management to ensure conservation in the long term.**

**For example, by:**

- Building on existing stakeholder groups and strategies involved in landscape conservation including, for example, AONB management plans and county green infrastructure strategies.
- Designing any new development to accommodate and sustainably conserve the historic and ecological features and functions of historic land uses and their setting. Avoid negative impacts upon historic setting and the ecological network, working across administrative boundaries within and adjacent to the NCA.
- Using understanding of the area's traditional and historic architecture, and its distinct patterns of settlement, to inform appropriate conservation of historic buildings and settings, and planning for and inspiring any new development so that it makes a positive contribution to local character. Where an existing structure is negatively impacting on a historic setting, consider removal or concealment where it is not possible to improve the structure.
- Identifying and conserving semi-natural habitats that are often associated with historic land uses in the Chilterns, such as chalk grassland, heathland, species-rich scrub, lowland meadow, species-rich hedgerow, traditional orchards, chalk streams and acid grassland. Recognise and conserve all habitats and species of principal importance, including those within SAC, SSSI and Local Wildlife Sites.
- Managing the landscape around pockets of habitat to provide buffers, connections and food for wildlife, for example by locating field margins, field corners and low-input grassland where they will most benefit the ecological network and nearby species populations.
- Identifying where bats, owls and other species are making use of historical structures such as barns, and manage structures and the surrounding ecological network accordingly. Prioritise management of protected species and species of principal importance.
- Confirming the specialist species associated with historic land uses and establishing management that reflects the requirements of specialist species; that is, niche management, or traditional management. Develop management strategies for species with restricted distributions, particularly in light of climate change.
- Restoring historic features associated with chalk streams, such as mills, ponds, watercress beds and watermeadows, particularly where restoration of the historic land use will support traditional management that can sustain valued habitats.

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**SEO 2: In pockets of historic land use where natural and cultural heritage are both particularly rich, aim to restore and strengthen the historic landscape, ecological resilience and heterogeneity, and to conserve soils. Ensure that species-rich habitats are conserved and extended, including internationally important species-rich Chiltern downland. Secure environmentally and economically sustainable management to ensure conservation in the long term.**

**For example, by:**

- Identifying current and future threats to historic land uses and features in the Chilterns and reviewing ecological, historic and landscape designations to ensure that there is appropriate protection. Consider ecological designations for parklands, orchards, chalk streams and hedgerows in particular. Develop a strategy for conserving historic features that are not recognised by Scheduled Monument or Registered Park and Garden designations, such as co-axial fields.
- Establishing resilient core areas from which to expand by targeting conservation in those locations where existing ancient natural and cultural features are particularly numerous and accessible to the public, including the strip parishes along the scarp, parklands, pockets of ancient field systems and areas of open access common and downland.
- Maintaining and enhancing habitat heterogeneity to support specialist and generalist species associated with historic land uses and to provide connections to assist species movement through the landscape. Develop a strategy to address northward and southward migration of species at the northern and southern ends of the Chilterns working across administrative boundaries.
- Restoring historic inter-visibility, long-distance views and viewpoints as appropriate, targeting historic assets that have since become wooded, such as prehistoric monuments on the escarpment.
- Beyond concentrations of habitat, working with neighbouring landowners to restore and create new areas of habitat and establish ecological and access connections, particularly in relation to fragmented chalk grassland and commons that are important to communities.
- Ensuring that planned change in the landscape, such as restoration and creation, is informed by an understanding of the area's historic landscape in order to avoid destruction of historic features and to identify opportunities to restore historic landscapes.
- Planning to strengthen networks or co-operatives of farmers, estates and land managers in order to facilitate landscape-scale approaches, including commercially viable large-scale downland grazing systems and catchment-scale resource protection.
- Ensuring that soil conservation is integrated into management objectives for historic landscapes, particularly where there is a long history of limited or no disturbance and chemical use. In doing so, secure climate regulation, soil quality and water quality benefits.

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**SEO 2: In pockets of historic land use where natural and cultural heritage are both particularly rich, aim to restore and strengthen the historic landscape, ecological resilience and heterogeneity, and to conserve soils. Ensure that species-rich habitats are conserved and extended, including internationally important species-rich Chiltern downland. Secure environmentally and economically sustainable management to ensure conservation in the long term.**

**For example, by:**

- Strengthening and creating new markets that support sustainable grazing and woodland management, including those around 'local'/'sustainable' products and recreation, for example visitor pay-back and charged car parking. Pursue opportunities to bring abandoned or neglected areas into productive management, particularly where losses to biodiversity and historic environment are high, such as on scrub-covered downland. Wood fuel and sheep's wool as insulation material are examples of products recently under demand which could potentially drive commercially viable management on a small or large scale.
- Creating new visions for habitat management and scenery where continuing tradition is not possible as a result of climate change or long-term economics. Explore possibilities such as non-traditional livestock on the downs, commercial recreational activities in woodlands, new species compositions and different vegetation structures in woodlands and grasslands. Planning to engage local communities in helping to conserve their local landscape by recruiting 'volunteer wardens' or 'lookers', attracting sponsors and establishing positive community uses of green spaces and rural buildings. Support and build capacity among existing community groups, for example the Chiltern Society, to conserve their local landscapes.
- Maximising visual and/or physical public access to restored historic landscapes, particularly near to settlements. Provide interpretation and education to enhance visitor experiences and encourage support for conservation activities, particularly near to settlements and at popular destinations.
- Enhancing visitor experience by providing a fit-for-purpose access network that links features across the landscape and appropriate visitor facilities that are sustainable and do not impact negatively on the rural scene.



Brick and flint are common building materials.

**SEO 3: Conserve the Chilterns' groundwater resource, River Thames and chalk streams by working in partnership to tackle inter-related issues at a catchment scale and also across the water supply network area. Seek to secure, now and in the future, sustainable water use and thriving flood plain landscapes that are valued by the public.**

**For example, by:**

- Working in partnership to meet Water Framework Directive objectives for good ecological status (surface water) or good status (groundwater) across the Chilterns. Working at a catchment scale, continue to investigate and implement measures that improve river morphology and river ecology, including measures to tackle low flows.
- Building on existing stakeholder groups and strategies involved in water resource management and conservation including, for example, catchment management plans, AONB management plans and county green infrastructure strategies.
- At the parish and neighbourhood level, providing information that will enable residents to recognise, conserve and enjoy their local chalk streams, ponds and other waterbodies. Strengthen the identity of chalk streams as positive focal points for settlements and communities.
- Drawing on best practice developed by the Chilterns Chalk Streams Project and others to deliver work along the entire length of chalk streams in the Chilterns.
- Reviewing ecological designations for chalk streams and other flood plain habitats in the Chilterns to ensure appropriate protection and conservation management.
- At a catchment scale, strengthening engagement with resident, workplace and farmer communities regarding water usage, pollution, flood risk and low flows in the Chiltern environment. Support consumers in bringing consumption rates down to average or below average levels.
- Through a partnership of water companies operating across the water supply network area, securing sustainable abstraction and consumption across the water supply network area. Recognise and address the links of supply and environmental impact between the Chilterns and other National Character Areas (NCAs), including Berkshire and Marlborough Downs, Inner London and North Downs.
- Building public and consumer support across the water supply network area for the conservation of groundwater and surface water by enhancing access to watercourses. Consider Local Nature Reserve declaration for chalk stream green spaces and hold events and volunteering activities at waterside locations.
- Providing information about chalk stream ecology and the negative impacts on the landscape of unsustainable water use. Enable consumers to recognise the visual/obvious signs of positive and negative impacts of their water use on Chiltern chalk streams.
- Bringing together the various recreational user groups relating to the Thames and Chilterns chalk streams so that they can shape the future of local watercourses as recreational assets and secure sustainable recreational use. Enable them to support conservation activities.

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**SEO 3: Conserve the Chilterns' groundwater resource, River Thames and chalk streams by working in partnership to tackle inter-related issues at a catchment scale and also across the water supply network area. Seek to secure, now and in the future, sustainable water use and thriving flood plain landscapes that are valued by the public.**

**For example, by:**

- Planning to review and build networks of stakeholders across a catchment and/or abstraction area to help conserve the water resource and develop approaches to deliver sustainable development, sustainable land management and sustainable water use. Focus particularly on achieving sustainable water use in areas where rivers and groundwater are considered to be over-abstracted and around growth areas such as Luton. Plan for climate change impacts and future consumer demands.
- Minimising soil compaction and soil sealing in order to facilitate infiltration to the aquifer and minimise the volume and rate of run-off.
- Maximising opportunities arising from waterside development to restore and enhance the adjacent watercourse. In relation to any development, seek planning gain that will restore modified sections and enhance visual and/or physical public access to a watercourse.
- Drawing from best practice and developing innovative solutions that restore watercourses constrained by existing development and that improve poorly engineered channels. Restore urban sections so that watercourses are attractive focal points within the urban environment.
- Expanding the areas of semi-natural habitat in chalk stream flood plains with the aim of improving the ecological network and increasing the extent of habitats of principal importance, such as wet woodland. Conserve and create new ponds. Create habitat so that it also provides recreation, floodwater storage, pollution filtration and biodiversity benefits, as appropriate.
- Designing any work on the ground to contribute positively to the ecological network and natural processes that operate across the landscape, both within and beyond the catchment and within both urban and rural settings. Where possible, restore natural channels to allow natural river processes to take place and create areas of floodwater storage in the flood plain. Seek to extend and connect fragments of semi-natural habitat in the flood plain and nearby.
- Planning any developments to minimise demands and impacts on the water resource, including incorporating features such as sustainable urban drainage systems (SUDS). Seek opportunities to address negative impacts of existing development, including tackling pollution pathways from industry.
- Supporting farmers and other land managers in preventing pollution, conserving soils, using water efficiently and managing and creating flood plain habitats. Draw on best practice, for example catchment sensitive farming techniques.
- Ensuring that there is adequate understanding of future water resource challenges among all key stakeholders, particularly in relation to resources and habitats that are already under stress, such as the Colne catchment.

**SEO 4: Enhance local distinctiveness and create or enhance green infrastructure within existing settlements and through new development, particularly in relation to the urban fringe and growth areas such as Luton. Ensure that communities can enjoy good access to the countryside.**

**For example, by:**

- Building on existing stakeholder groups and strategies that influence development, including, for example, AONB management plans and county green infrastructure strategies.
- Designing and locating development to maintain landscape character and enhance green infrastructure provision across the NCA, drawing on best practice as undertaken by, for example, the Chilterns AONB and North Wessex Downs AONB. Adapt or remove existing development where to do so would significantly strengthen landscape character, enhance views and address barriers to natural processes and public access to the countryside.
- Seeking to conserve the setting of the two AONB landscapes outside of their boundaries when undertaking development and land management, working across planning authority boundaries as necessary.
- Maximising the benefits of planning gain by strategically allocating gain across the NCA and across planning authority boundaries. Ensure that planning gain supports an ecosystems approach. Prioritise such efforts where there are development pressures, for example in growth areas.
- Ensuring that there is an accurate and up-to-date understanding of green infrastructure needs, particularly in relation to growth areas such as Luton.
- Responding to recreation demands and visitor pressures strategically. Manage green spaces and routes across the landscape as a connected network that can dissipate or concentrate visitor pressure.
- Addressing deficits in greenspace and access links, integrating the public transport and cycle network and creating new or improved multi-user routes and green spaces working across administrative boundaries as necessary.
- Supporting farmers in providing public access routes and areas and hosting school visits, particularly where this fills gaps in provision and secures access near settlements. Target farmers around Watford, Hemel Hempstead and Amersham.
- Maximising the appeal of existing and new green spaces and sustainable transport routes close to people's homes and workplaces, including in the urban fringe where it could also strengthen landscape character.
- Considering declaration of additional Local Nature Reserves and new country parks, particularly near to settlements. Ensure that visitor needs are well met at Local Nature Reserves and country parks.
- Establishing improved and new green infrastructure that supports natural processes through securing resilient ecological networks and functioning flood plains. Identify major barriers to significant ecological processes and seek to restore better ecological function working across administrative boundaries as necessary.
- Enhancing the rural and urban scene by promoting the use of traditional local building materials and vernacular styles and utilising appropriate infrastructure. Draw on best practice as developed by, for example, the Chilterns AONB.

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**SEO 4: Enhance local distinctiveness and create or enhance green infrastructure within existing settlements and through new development, particularly in relation to the urban fringe and growth areas such as Luton. Ensure that communities can enjoy good access to the countryside.**

**For example, by:**

- Addressing negative impacts on tranquillity associated with traffic and large visitor numbers across the NCA. Promote alternative routes and destinations at a strategic scale to disperse impacts where appropriate. Design new and existing green spaces, routes and visitor facilities to better manage noise, high visitor numbers and multiple user groups or activities. Identify those locations where improved tranquillity will significantly enhance people's experience of key places and routes across the landscape.
- Designing all development and transport infrastructure to support sustainable soil and water use, flood management and pollution prevention, incorporating features such as SUDS. Focus particularly on areas where pollution, flooding and/or low flows have a negative impact. Co-ordinate activity on a catchment scale. Consider opportunities to combine with green space, to realise biodiversity and access benefits.
- Adapting traditional building designs and materials as appropriate to ensure resilience to climate change.
- Supporting suppliers and contractors who can help to conserve the traditional built environment and incorporate traditional materials into new constructions.
- Identifying key viewpoints where the appearance of the landscape is particularly valued. Monitor and conserve these viewpoints as a priority and promote them as visitor destinations as appropriate.

## Supporting document 1: Key facts and data

Area of Chilterns National Character Area (NCA): 164,093 ha

### 1. Landscape and nature conservation designations

Fifty per cent of the NCA (82,627 ha) lies within the Chilterns Area of Outstanding Natural Beauty (AONB) and 2 per cent (2,649 ha) within the North Wessex Downs AONB.

- Management plans for the protected landscapes can be found at:  
[www.chilternsaonb.org/](http://www.chilternsaonb.org/)  
[www.northwessexdowns.org.uk/](http://www.northwessexdowns.org.uk/)

Source: Natural England (2011)

#### 1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	% of NCA
International	n/a	n/a	0	0
European	Special Protection Area (SPA)	n/a	0	0
	Special Area of Conservation (SAC)	Chilterns Beechwoods SAC; Aston Rowant SAC; Hartslock Wood SAC	1,442	1

Tier	Designation	Name	Area (ha)	% of NCA
National	National Nature Reserve (NNR)	Aston Rowant NNR; Barton Hills NNR; Knocking Hoe NNR	169	<1
	Site of Special Scientific Interest (SSSI)	A total of 87 sites wholly or partly within the NCA	3,656	2

Source: Natural England (2011)

Please Note: (i) Designated areas may overlap (ii) all figures are cut to Mean High Water Line, designations that span coastal areas/views below this line will not be included.

Land covered by international and European nature conservation designations totals 1,442 ha or 1 per cent of the total land area; national designations cover 3,656 ha or 2 per cent. The SAC are also SSSI. Both Barton Hills and Knocking Hoe NNRs are within the SSSI designated area but Aston Rowant NNR is only partially SSSI designated.

There are 1,062 local sites in the Chilterns covering 12,647 ha which is 8 per cent of the NCA.

Source: Natural England (2011)

- Details of individual Sites of Special Scientific Interest can be searched at:  
<http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm>
- Details of Local Nature Reserves (LNR) can be searched at:  
[http://www.lnr.naturalengland.org.uk/Special/lnr/lnr\\_search.asp](http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp)
- Maps showing locations of Statutory sites can be found at:  
<http://magic.defra.gov.uk/website/magic/> – select 'Rural Designations Statutory'

### 1.1.1 Condition of designated sites

SSSI Condition Category	Area (ha)	Percentage of NCA SSSI Resource
Unfavourable declining	41	1
Favourable	2,336	64
Unfavourable no change	53	2
Unfavourable recovering	1,226	34

Source: Natural England (March 2011)

- Details of SSSI condition can be searched at:  
<http://www.sssi.naturalengland.org.uk/Special/sssi/reportIndex.cfm>

## 2. Landform, geology and soils

### 2.1 Elevation

Elevation ranges from 18 m on the River Thames flood plain to a maximum of 267 m near Wendover on the chalk ridge. Mean elevation is 126 m.

Source: Natural England (2010); Chilterns AONB Management Plan 2008-13

### 2.2 Landform and process

Landform is dictated by chalk strata which have been tilted upward to create a north-east to south-west escarpment. The scarp faces north-west across low-lying vales. The dip slope descends down into the London Basin and appears as a plateau behind the crest of the scarp.

Numerous valleys incise the dip slope creating a ridge and valley topography. The landform is generally rounded and rolling.

Valleys without watercourses, known as dry valleys or 'coombes', are periglacial landforms created during the Quaternary (the last ice age) when frozen ground prevented water percolating into the chalk.

Some stretches of watercourses, known as 'bournes', only flow when the water table is high. Spring line watercourses rise at the foot of the escarpment to flow out across the clay vales to the north. The River Thames cuts a narrow valley through the chalk escarpment at Goring. Natural river processes are restricted where watercourses are heavily modified and artificial.

Source: Chilterns AONB Management Plan 2008-13; Chilterns Buildings Design Guide; Thames River Basin Management Plan

### 2.3 Bedrock geology

The Chilterns escarpment is composed of chalk and is part of a larger mass that extends from East Anglia through the Chilterns to the Wessex Downs and underlies the London Basin. It is a type of limestone created under unique conditions in warm, shallow seas 70 to 95 million years ago. Marl and flint nodules are often associated and some chalk layers yield important fossils such as sea urchins and ammonites. Lower Chalk forms the base of the escarpment, Middle Chalk forms the main slope of the scarp and Upper Chalk forms the top of the scarp and bulk of the dip slope. The Lower Chalk is marly (has more clay) and contains harder bands of rock including the Tottenhoe Stone. The Middle Chalk is banded top and bottom by harder chalk rock and Melbourn rock, with the latter forming the base of the main valleys in the Chilterns.

In addition the NCA contains more recent Tertiary sediments of 65 to 2 million years ago. Being on the rim of the London Basin, there are small outcrops of Lambeth Group deposits on the dip slope. Tertiary sediments are also found as loose blocks of silica-cemented sand or pebble conglomerates on valley slopes and bottoms. These rocks are called 'sarsen stones'.

**Source:** Chilterns Natural Area Profile; Chilterns AONB Management Plan 2008-13; Natural England county geology profiles

### 2.4 Superficial deposits

During the Quaternary, the chalk bedrock was subject to erosion by freezing and thawing, creating extensive 'clay with flint' deposits which cap the ridges between the valleys up to a depth of 4 m. Tundra conditions also deposited wind-blown material called loess.

Gravels lie at the foot of the dip slope including along the Thames valley. Archaeological artefacts have been found in gravels.

**Source:** Chilterns Natural Area Profile

### 2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	14
National	Mixed Interest SSSIs	0
Local	Local Geological Sites	33

**Source:** Natural England (2011)

- Details of individual Sites of Special Scientific Interest can be searched at: <http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm>

### 2.6 Soils and Agricultural Land Classification

A mixture of acidic and calcareous soils, derived from the variable geology of chalk, clay and gravels, permits mixed farming. Thin rendzina soils are found on the chalk. Heavy clay soils containing flints are found across the plateau and often support woodland.

**Source:** Chilterns AONB Management Plan

The main grades of agricultural land in the NCA are broken down as follows (as a proportion of total land area):

Grade	Area (ha)	% of NCA
Grade 1	196	<1
Grade 2	18,049	11
Grade 3	109,004	66
Grade 4	5,942	3
Grade 5	55	<1
Non-agricultural	13,726	8
Urban	17,122	10

Source: Natural England (2010)

- Maps showing locations of Statutory sites can be found at: <http://magic.defra.gov.uk/website/magic/> – select 'Landscape' (shows ALC classification and 27 types of soils).

### 3. Key water bodies and catchments

#### 3.1 Major rivers/canals

The following major rivers/canals (by length) have been identified in this NCA.

■ River Thames	52 km
■ River Lea or Lee	19 km
■ River Misbourne	16 km
■ Grand Union Canal	13 km
■ River Chess	7 km
■ River Ver	6 km
■ River Hiz	6 km
■ River Wye	n/a
■ River Gade	n/a
■ River Bulbourne	n/a

Source: Natural England (2010)

Watercourses originate on the dip slope, at the foot of the scarp and from outside the NCA.

Chalk watercourses flow south-east off the dip slope and are tributaries of the Thames catchment, many with a long history of management and modification. There are numerous small streams and springs emerging onto the clay vales at the foot of the escarpment which are tributaries of the Thame (Thames) and Great Ouse (East Anglian) catchments.

The Thames flows from the clay vales to the north and cuts through the chalk ridge at Goring in the south.



The Grand Union Canal links London to the Midlands and has associated reservoirs and arms to Aylesbury and Wendover. It interacts with the Rivers Bulbourne, Gade and Colne.

**Please note: Other significant rivers (by volume) may also occur. These are not listed where the length within the NCA is short.**

**Source: Thames River Basin Management Plan;**

### 3.2 Water quality

The total area of Nitrate Vulnerable Zone (NVZ) is 154,097 ha, or 94 per cent of the NCA.

**Source: Natural England (2010)**

### 3.3 Water Framework Directive

Maps are available from the Environment Agency showing current and projected future status of water bodies at:

[http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopic&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopic&lang=_e)

## 4. Trees and woodlands

### 4.1 Total woodland cover

The NCA contains 27,153 ha of woodland or 17 per cent of the total area, of which 12,113 ha or 7 per cent is ancient woodland. Within the NCA, the Chilterns AONB is one of the most wooded landscapes in England with 21 per cent woodland cover, of which 56 per cent is ancient. Watling Chase Community Forest covers 323 ha, less than one cent of the area.

**Source: Natural England (2010), Forestry Commission (2011), Chilterns AONB Management Plan**

### 4.2 Distribution and size of woodland and trees in the landscape

Woodland is widespread, being found on the plateau and as 'hanger' woods in the valleys and on scarp slopes. Woodland blocks are scattered densely across the NCA as a mosaic with other semi-natural habitats and farmed land, except in the northern third where woodlands are present as smaller, more isolated fragments. In the AONB, woodland cover is highest in the south-west – in Oxfordshire – at 30 per cent.

Broadleaved trees dominate. Varied geology supports a range of species including oak, birch, holly and hazel on the plateau and ash, wych elm, field maple and cherry on the chalk escarpment. Ancient beechwoods are a distinctive feature of the AONB and are particularly associated with the 18th and 19th century local furniture industry. Many woods have a history of being planted, replanted or selectively managed to create beech high forest, although records suggest beech is also the naturally dominant woodland type. As well as beech high forest, ancient coppice woodlands are also present. Cherry orchards can be found in the central Chilterns and very rare natural box woods are present on the scarp.

Tree clumps and field trees associated with parklands, wood pasture and large gardens also contribute to the resource. Ancient and veteran trees are also associated with former wood pasture on common land.

**Source: Chilterns AONB Management Plan 2008-13; Natural Area profile; Ancient beechwoods in the Chilterns**

#### 4.3 Woodland types

A statistical breakdown of the area and type of woodland found across the NCA is detailed below.

Area and proportion of different woodland types in the NCA (over 2 ha)

Woodland type	Area (ha)	% of NCA
Broadleaved	21,517	13
Coniferous	3,807	2
Mixed	794	<1
Other	1,035	1

**Source: Forestry Commission (2011)**

Area and proportion of ancient woodland and planted ancient woodland within the NCA.

Type	Area (ha)	% of NCA
Ancient semi-natural woodland	7,125	4
Planted Ancient Woodland (PAWS)	4,988	3

**Source: Natural England (2004)**

## 5. Boundary features and patterns

### 5.1 Boundary features

Hedgerows are the main boundary type, many of them ancient.

**Source: Countryside Character Area description; Countryside Quality Counts (2003)**

### 5.2 Field patterns

Field patterns are variable although small fields are typical and especially common on steeper ground. Boundaries generally date back to medieval times. Between High Wycombe and Hemel Hempstead, fields are considerably smaller and are either rectilinear or small squares. In the south-west and north-east, fields are medium to large with generally irregular, gently curving boundaries. Subdivision of fields into horse paddocks is significant in the AONB where approximately 5 per cent of land is under equestrian use.

**Source: Chilterns AONB Management Plan 2008-13; Countryside Character Area description; Countryside Quality Counts (2003); Chilterns Land Use Change Survey 2010 Report**

## 6. Agriculture

The following data has been taken from the Agricultural Census linked to this NCA.

### 6.1 Farm type

In 2009, holdings were predominantly cereals, 372 holdings or 32 per cent, grazing livestock accounted for 246 holdings or 21 per cent, 32 per cent of holdings were recorded as 'other types'. Far fewer holdings were mixed, 62 holdings or 5 per cent; horticulture, 50 holdings or 4 per cent; and dairy, 21 holdings or 2 per cent. In the AONB, diversity of livestock now includes alpacas, deer and emu. Between 2000 and 2009 cereal holdings reduced by 43 or 10 per cent and the most notable decrease was the halving of dairy holdings from 42 to 21.

**Source: Agricultural Census, DEFRA (2010); Chilterns AONB Management Plan 2008-13**

## 6.2 Farm size

There were 1,168 recognised holdings covering 93,392 ha of the NCA in 2009. Farms of the largest size bracket were predominant; covering 68,999 ha or 74 per cent of the farmed area spread across 270 holdings. Farms of between 5 ha to 20 ha were more numerous in number at 387 holdings, but only accounted for 4,216 ha or 5 per cent of the farmed area. In the AONB, there are numerous large estates.

In the Chilterns AONB, there has been an increase in the number of small farms associated with hobby farming, in other words non-commercial holdings. In 2009, there were 112 farms of less than 5 ha recognised as commercial holdings in the NCA.

**Source: Agricultural Census, DEFRA (2010); Chilterns AONB Management Plan 2008-13**

## 6.3 Farm ownership

In 2009 owned land accounted for 60 per cent or 56,090 ha of the total farmed area, while the remainder was tenanted.

**Source: Agricultural Census, DEFRA (2010)**

## 6.4 Land use

Cereals have the highest land use cover in hectares, 37,115 ha or 40 per cent of farmed area, followed by grass and uncropped land at 34,211 ha or 37 per cent. Oilseeds at 6,497 ha or 7 per cent and 'other arable crops' 6,557 ha or 7 per cent made up the majority of the remaining area.

Between 2000 and 2009, cereals reduced by 5,718 ha or 13 per cent. Significant changes related to 'other arable crops' which increased by 40 per cent or 1,879 ha and vegetables which reduced to just 98 ha from 286 ha.

In the Chilterns AONB, small holdings associated with hobby farming exhibit mixed land uses.

**Source: Agricultural Census, DEFRA (2010); Chilterns AONB Management Plan 2008-13**

## 6.5 Livestock numbers

In 2009, sheep were the most numerous livestock (54,000 animals), followed by cattle (28,000 animals) and pigs (21,000 animals). All livestock numbers fell between 2000 and 2009; pig numbers most significantly, by over half from 50,000 to 21,000. Over the same period sheep numbers dropped by 10,000 or 16 per cent and cattle by 4,000 or 12 per cent.

**Source: Agricultural Census, DEFRA (2010)**

## 6.6 Farm labour

In 2009 there were 2,515 farm workers on commercial holdings, of which principal farmers accounted for 59 per cent. Only 120 salaried managers were employed, with 379 full time and 308 part time workers. Casual labour made up 8 per cent of labour.

Between 2000 and 2009, labour reduced by 167 in total, including losses among principal farmers (61) and full time workers (113). Part time workers increased by 75 and salaried managers by 5.

In the Chilterns AONB, there are a notable number of hobby farmers. In addition, the farmer demographic is ageing and the number of new entrants is declining.

**Source: Agricultural Census, DEFRA (2010); Chilterns AONB Management Plan 2008-2013**

**Please Note: (i) Some of the Census data is estimated by Defra so will not be accurate for every holding (ii) Data refers to Commercial Holdings only (iii) Data includes land outside of the NCA belonging to holdings whose centre point is within the NCA listed.**

## 7. Key habitats and species

### 7.1 Habitat distribution/coverage

Semi-natural habitats are scattered across the area in a mosaic with farmed land. There are noticeably smaller and fewer areas in the northern third of the NCA. Woodland makes up the vast majority of the resource, while the remaining areas represent a variety of scattered, fragmented habitats including acid, neutral and calcareous grassland, chalk streams, heathland, wood pasture and parkland, reedbed and fen. The variety of habitat reflects the varied geology and history of land management. Ashridge Commons and Woods, near Hemel Hempstead represent the largest contiguous complex of varied habitats and cover an area of 627 ha. On a much smaller scale commons across the area, and notably within the AONB, contain remnants of chalk grassland, heathland, acid grassland, ponds and wood pasture as can be seen at Moorend Common on the Dunstable Downs.

The Chilterns have the most extensive native beech woodland in England, located on the plateau and as beech 'hangers' on steeper slopes. All the native beech wood types are present from the dry woods on acid soils, oak-beech woods on heavy clay to the most diverse on thin chalky redzina soils, plus the extreme yew and box wood types. The beech woods on the chalk scarp are the most interesting, supporting rare fungi and orchids such as the ghost orchid. Those on acid soils have poor ground flora interest, limited to species such as coralroot bittercress. A few woodlands are not dominated by beech and contain ancient coppice, for example Hodgemoor Woods, Hog and Hollow Woods. Much of the secondary woodland, including that on commons, has enhanced interest due to its history as former chalk grassland or wood pasture.

Remnants of chalk downland are found on the scarp face and steeper valley slopes. In the AONB a 2008 audit identified at least 700 ha of chalk grassland. Some of the chalk grassland will not be high quality and scrub encroachment reduces the area. Downland supports unique and rich plant communities including small scabious, rockrose, candytuft and others, and invertebrates such as silver spotted skipper and Duke of Burgundy fritillary. In addition, the Chiltern grasslands support species which are uncommon elsewhere on the chalk grasslands of southern England, for example, early gentian, monkey orchid and pasque flower. The Chilterns is a national stronghold for a short, very species rich type of chalk grassland characterised by sheep's fescue, mouse-ear hawkweed and basil thyme. It supports a range of specialised insects, mosses, liverworts, molluscs and invertebrates. Associated rare habitats are chalk heath found at Shirburn and Coombe Hills and juniper scrub at Aston Rowant.

Chalk rivers and streams are characterised by water crowfoots and support a high diversity of plants, insects, birds and fish, including some of the UK's most endangered species including reed bunting, water vole and brown trout. River margins are of interest as well as winterbourne sections which support a unique assemblage of plants and animals. The River Thames also has limited interest, including wet meadow and fen between Henley and Marlow and species including Loddon lily and Daubenton's bat. Other small wetland habitats in the Chilterns include rare calcareous fen, as at Pitstone and Bledlow, and wet woodland.

The farmed landscape supports nationally important assemblages of declining farmland birds including nationally important populations of corn bunting and linnet. The Chilterns are a national stronghold for arable weeds, including pheasant's eye and ground pine. In addition, the estimated length of hedgerow in the AONB part of the area is 4,045 km (2,528 miles), with much of this being species rich, including field maple, hornbeam, hazel and way faring tree among others. Hedgerows often contain ancient and veteran trees. Old trackways and ponds are also a feature of farmland that can support wildlife interest.

Source: Chilterns AONB Management Plan, Chilterns Natural Area Profile

### 7.2 Biodiversity Action Plan (BAP) priority habitats

The Government's new strategy for biodiversity in England, Biodiversity 2020, replaces the previous Biodiversity Action Plan (BAP) led approach. Priority habitats and species are identified in Biodiversity 2020, but references to BAP priority habitats and species, and previous national targets have been removed. Biodiversity Action Plans remain a useful source of guidance and information. More information about Biodiversity 2020 can be found at:

<http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/englandsbiodiversitystrategy2011.aspx>

The NCA contains the following areas of mapped priority habitats (as mapped by National Inventories). Footnotes denote local/expert interpretation. This will be used to inform future national inventory updates.

Habitat	Area (ha)	% of NCA
Broadleaved mixed and yew woodland (Broad habitat)	14,732	9
Lowland calcareous grassland	1,192	1
Coastal and flood plain grazing marsh	341	<1
Lowland meadows	161	<1
Lowland dry acid grassland	53	<1
Fens	52	<1
Reedbeds	16	<1
Lowland heathland	14	<1
Purple moor grass and rush pasture	4	<1

Source: Natural England (2011)

- Maps showing locations of UK BAP priority habitats are available at: <http://magic.defra.gov.uk/website/magic/> select 'Habitat Inventories'

### 7.3 Key species and assemblages of species

- Maps showing locations of UK BAP priority habitats are available at: <http://magic.defra.gov.uk/website/magic/>
- Maps showing locations of S41 species are available at: <http://data.nbn.org.uk/>



## 8. Settlement and development patterns

### 8.1 Settlement pattern

Neolithic clearance of woodland for agriculture and the development of an important Roman communications network established a settlement pattern still evident today. The oldest settlements are nucleated settlements located in valleys and at the foot of the escarpment, established due to reliable water supply. Many have Norman churches, village greens and ponds. Settlement on the higher ground was restricted to dispersed hamlets and farms until the mid-19th century, when scattered linear villages developed, usually around common land and along droving routes. Commons on the dip slope are very characteristic and are often associated with nearby towns and villages.

There are many parklands and designed landscapes along the River Thames and on sloping valley sides, including the Prime Minister's rural retreat at Chequers.

The proximity of the area to London meant that many of the towns along major road and rail corridors expanded greatly in the 19th and 20th centuries, including Luton and Hemel Hempstead in the north, Amersham in the centre on the Metropolitan London Underground line, and Thames-side, Marlow and Henley in the south. Major transport corridors follow the valleys and do not run along the escarpment.

Leisure land uses are prominent on the outskirts of towns and villages, including golf courses and horse paddocks.

**Source:** Chilterns AONB Management Plan, Chilterns Countryside Character Area description; Countryside Quality Counts (2003)

### 8.2 Main settlements

The main settlements within the NCA are: Luton/Dunstable; High Wycombe; Hemel Hempstead; Amersham/Chesham; Harpenden; Berkhamsted; Marlow and Henley-on-Thames. The total estimated population for this NCA (derived from ONS 2001 census data) is: 946,859.

**Source:** Chilterns Countryside Character Area description; Countryside Quality Counts (2003), Natural England (2012)

### 8.3 Local vernacular and building materials

Timber-frame was the traditional material for most buildings until the 18th century when brick began to be widely used. Brick was often made locally, giving rise to variations of colour and quality. Flint was also widely used in combination with brick and is particularly common in the central plateau areas. Clay tiles became the general roofing material from 16th century, but Welsh slate is also found and in Oxfordshire, thatch. Rarely, local Tottenhoe Stone and clunch are used. The consistent range of building materials used in different combinations throughout the AONB is distinctive.

Dating back to the 1920s and 30s, buildings of the 'Metroland' style are found along the Metropolitan London Underground line.

**Source:** Chilterns AONB Management Plan, Chilterns Countryside Character Area description; Countryside Quality Counts (2003)

## 9. Key historic sites and features

### 9.1 Origin of historic features

The Chilterns is a long-settled area with features dating back to prehistory. Many features survive in the AONB because the land has not been intensively cultivated or developed.

The earliest evidence of human activity is found at flint working sites in Caddington, dating back to the early Palaeolithic (125,000 – 70,000 BC). Subsequent periods of prehistory are evidenced by more visible earthworks, the majority being on the escarpment and in the Thames Valley. Neolithic barrows are found at Whiteleaf and around Dunstable. Barrows from the Bronze Age are more common, for example, Edlesborough and Wendover. Hill forts and dykes from the Iron Age are found along the scarp, connected by the Ridgeway or Icknield Way, which has been in use since the Neolithic, and along the Thames Valley. Grim's Ditch is one of several Iron Age linear dykes – evidence of extensive land divisions – stretching from Great Hampden to Dunstable. Pre-Roman 'co-axial' patterns of parallel trackways and fields exist.

The Ridgeway is reputedly the oldest road in the country dating back to prehistoric times when it linked Wessex to East Anglia. In the wider landscape, there are extensive ancient routes and sunken lanes or 'hollow ways'. The Roman roads of Watling Street (A5) and Akeman Street (A41) run through the Chilterns. The Anglo-Saxon boundary known as the Black Hedge and the old Hundreds boundaries are also of interest.

Medieval buildings survive, such as flint churches and timber-framed barns. Former parks are now evident as commons, for example at Ashridge, Hampden. Brick kilns, windmills, Brunel bridges, canals and designed landscapes are more recent historical features. Parklands include examples of 18th century designs by Bridgeman, Repton and Brown, for example Tring Park and Ashridge, and often contain or are surrounded by distinctive estate architecture.

**Source: Draft Historic Profile, Countryside Character Area description**

### 9.2 Designated historic assets

This NCA has the following historic designations:

- 40 Registered Parks and Gardens covering
- 4,696 ha (15 in the AONB)
- 0 Registered Battlefields
- 202 Scheduled Monuments (122 in the AONB)
- 6,851 Listed Buildings

**Source: Natural England (2010); Chilterns AONB Management Plan 2008-13**

- More information is available at the following address:  
<http://www.english-heritage.org.uk/caring/heritage-at-risk/>

<http://www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/>

## 10. Recreation and access

### 10.1 Public access

- Six per cent of the NCA or 10,642 ha, is classified as being publically accessible and includes significant areas of downland on the ridge.
- There are 3,563 km of public rights of way at a density of 2.2 km per km<sup>2</sup>.
- There are 2 National Trails within the NCA. The Thames Path extends over 54 km and The Ridgeway over 67 km, predominantly along the ridge of the escarpment.

Sources: Natural England (2010)

The following table shows the breakdown of land which is publically accessible in perpetuity:

Access designation	Area (ha)	% of NCA
National Trust (Accessible all year)	1,745	1
Common Land	2,719	2
Country Parks	251	<1
CROW Access Land (Section 4 and 16)	4,829	3
CROW Section 15	2,751	2
Village Greens	127	<1
Doorstep Greens	3	<1
Forestry Commission Walkers Welcome Grants	4,316	3
Local Nature Reserves (LNRs)	649	<1
Millennium Greens	6	<1
Accessible National Nature Reserves (NNRs)	211	<1
Agri-environment Scheme Access	146	<1
Woods for People	6,301	4

Sources: Natural England (2011)

**Please Note:** Common Land refers to land included in the 1965 commons register; CROW = Countryside and Rights of Way Act 2000; OC and RCL = Open Country and Registered Common Land.

## 11. Experiential qualities

### 11.1 Tranquillity

Lowest scores for tranquillity are associated with the urban areas of Luton/ Dunstable, Hemel Hempstead and High Wycombe, and the concentration of development along the south-east boundary. The most tranquil areas are the scarp slopes of the north-west boundary and areas of the plateau, particularly to the south of Aylesbury.

A breakdown of tranquillity values for this NCA is detailed in the table below:

Category of tranquillity	Score
Highest value within NCA	30
Lowest value within NCA	-108
Mean value within NCA	-21

Sources: CPRE (2006)

- More information is available at the following address:  
<http://www.cpre.org.uk/what-we-do/countryside/tranquil-places/in-depth/item/1688-how-we-mapped-tranquillity>

### 11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. A breakdown of intrusion values for this NCA is detailed in the table below.

Category of intrusion	1960s (%)	1990s (%)	2007 (%)	% change (1960s-2007)
Disturbed	41	59	67	26
Undisturbed	51	33	20	-31
Urban	8	8	13	5

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are significant loss of undisturbed land, just over 30 per cent, and an increase in the area of disturbed land of about 25 per cent.

- More information is available at the following address:  
<http://www.cpre.org.uk/resources/countryside/tranquil-places>

## 12. Data sources

- British Geological Survey (2006)
- Natural Area Profiles, Natural England (published by English Nature 1993-1998)
- Countryside Character Descriptions, Natural England (regional volumes published by Countryside Commission/Countryside Agency 1998/1999)
- Joint Character Area GIS boundaries, Natural England (data created 2001)
- National Parks and AONBs GIS boundaries, Natural England (2006)
- Heritage Coast Boundaries, Natural England (2006)
- Agricultural Census June Survey, Defra (2000,2009)
- National Forest Inventory, Forestry Commission (2011)
- Countryside Quality Counts Draft Historic Profiles, English Heritage (2004)\*
- Ancient Woodland Inventory, Natural England (2003)
- BAP Priority Habitats GIS data, Natural England (March 2011)
- Special Areas of Conservation data, Natural England (data accessed in March 2011)
- Special Protection Areas data, Natural England (data accessed in March 2011)
- Ramsar sites data, Natural England (data accessed in March 2011)
- Sites of Special Scientific Interest, Natural England (data accessed in March 2011)
- Detailed River Network, Environment Agency (2008)
- Source protection zones, Environment Agency (2005)
- Registered Common Land GIS data, Natural England (2004)
- Open Country GIS data, Natural England (2004)
- Public Rights of Way Density, Defra (2011)
- National Trails, Natural England (2006)
- National Tranquillity Mapping data, CPRE (2007)
- Intrusion map data, CPRE (2007)
- Registered Battlefields, English Heritage (2005)
- Record of Scheduled Monuments, English Heritage (2006)
- Registered Parks and Gardens, English Heritage (2006)
- World Heritage Sites, English Heritage (2006)
- Incorporates Historic Landscape Characterisation and work for preliminary Historic Farmstead Character Statements (English Heritage/Countryside Agency 2006)

Please note all figures contained within the report have been rounded to the nearest unit. For this reason proportion figures will not (in all) cases add up to 100%. The convention <1 has been used to denote values less than a whole unit.



## Supporting document 2: Landscape change

### Recent changes

#### Trees and woodlands

- There has been an increase in the amount of woodland being managed under agreements with the Forestry Commission; increased from 27 per cent to 34 per cent of the eligible woodlands identified in the National Inventory of Woodland and Trees.
- Agreements have funded very limited woodland creation between 1999 and 2003.
- Of the NCA designated as the Chilterns AONB, 20 per cent of woodlands were in a Forestry Commission woodland grant scheme in 2009. By 2011, this had risen to 36 per cent, a total of 6,504 ha.
- Of the NCA designated as the Chilterns AONB, felling licences applied to 1,912 ha of woodlands in 2011.

#### Boundary features

- Between 1999 and 2003, only 3 per cent of the NCA's field boundaries received payments for management, restoration or creation under agri-environment agreements. 105 km of hedge was planted and restored and 55 km of hedge was managed.

#### Agriculture

- Between 1999 and 2003, the rate of grassland loss slowed and reversed so that there is currently a balance between cereals and pasture.
- Agri-environment scheme uptake in the NCA has been above the national average, with a focus on semi-natural grassland conservation. Almost half the NCA has been within a target area for Higher Level Stewardship, focusing support for management, restoration and creation of landscape features in the Chilterns AONB and North Wessex Downs AONB.
- Of the NCA designated as the Chilterns AONB, the total area in agri-environment schemes, Environmental Stewardship and Countryside Stewardship, was 67 per cent of farmland in 2011, well distributed across the Chilterns AONB. Higher Level Stewardship agreement coverage in 2011 was above the national average at 11 per cent (HLS) and 2.3 per cent (Organic HLS), totalling nearly 7000 ha.
- New linear features have been created in the NCA under agri-environment schemes. In 2003, this included permanent grass margins greater than 6 m (269 km), 2 m arable margins (103 km), creation of 2 m grass margins or beetle banks (31 km), and buffer strips (2 km).
- Cattle and sheep numbers declined by 12 per cent (3,921) and 16 per cent (10,538) respectively between 2000 and 2009.

## Settlement and development

- There has been recent expansion around Dunstable, Harpenden, Hemel Hempstead and High Wycombe, with upgrading in 2003 of the A41 and a by-pass around Aston Clinton.
- Growth areas identified in the NCA include Milton Keynes-South Midlands and Cambridge-Stansted-Peterborough.
- Recent developments on the edge of scarp foot in and around historic market towns have altered the historic settlement pattern.
- Recreational land uses, including horse paddocks, golf courses and 'hobby' farms, are replacing commercial agricultural land uses.
- New road construction and road 'improvements' have affected the small scale road network, particularly on the dip slope and in the valleys.

## Semi-natural habitat

- In 2003, land managers in the NCA were being supported through agri-environment schemes in managing 757 ha chalk grassland, 568 ha of lowland pasture on neutral/acid soils 430 ha of grassland restoration and 327 ha lowland hay meadow.
- Of the NCA designated as the Chilterns AONB, the area of species rich grassland being maintained or restored under Higher Level Stewardship has increased between 2009 and 2011 from 198 ha to 1,012 ha. Since 2009, agreements have funded 226 ha of species rich grassland creation.

- In 2011, 40 of the 187 commons were managed under woodland or agri-environment scheme agreements. In 2011, a Chilterns Common Project was launched to support management outside scheme agreements on 10 to 15 commons over 4 years.
- Of the commons which are SSSI, there were positive trends in condition with 97 per cent in favourable or unfavourable recovering condition.
- 30 per cent of all SSSI in the NCA are recovering from unfavourable condition whilst 1.5 per cent are declining in condition.
- Of the NCA designated as the Chilterns AONB, 99 per cent of the total SSSI area was in favourable or unfavourable recovering condition in 2011, compared to 94 per cent in 2009. The number of Local Sites in positive conservation management has risen from 29 per cent in 2009 to 39 per cent in 2011.
- Of the NCA designated as the Chilterns AONB, 86 per cent of SSSI where chalk grassland is the main habitat were in favourable or unfavourable recovering condition in 2009. This increased to 98 per cent in 2011.
- Since 2010, the Chilterns Chalk Grassland Project has cleared scrub and improved conservation grazing infrastructure across twelve sites owned by the Wildlife Trusts.
- A Plantlife project 'Saving England's Lowland Juniper' successfully propagated and planted young juniper at several sites in 2010 and 2011, improving the chances of population survival.

## Historic features

- The rate of conversion of listed barns on a unit area basis is high, with over 200 conversions since 1999. About 67 per cent of listed historic farm buildings remained unconverted in 2003 and approximately 94 per cent were intact structurally.
- Parkland conservation has been supported by an Historic Parkland Grant for around 25 per cent of parkland and by agri-environment schemes for another 13 per cent.
- Scheduled monuments on the At Risk register in 2012 which were in a declining condition amounted to 15 sites, including two associated with Roman settlement near St Albans and Totternhoe Castle. No scheduled monuments or Registered Parks and Gardens were considered to be of improving condition in 2012.
- 90 ha of historic landscape have been managed under agri-environment schemes between 1999 and 2003.

## Rivers

- Low flow alleviation schemes have been in place for several years on the Misbourne and Ver. The majority of chalk streams suffer low flows - Gade, Bulbourne, Chess, Wye, Hughenden, Ver and Misbourne.
- In 2012, a project to provide advice to farmers and land managers in the Colne catchment will tackle pollution affecting surface and ground waters.

## Minerals

- Gravel working in the Thames Valley continues north of Maidenhead only.
- Active large chalk quarries are now limited to one in Bedfordshire. Totternhoe Stone (clunch) is quarried.
- Excavation for brick-making materials continues at two locations in Buckinghamshire; small scale brick making was once widespread.



An historic, hedged routeway leads to woodlands on Chinnor Hill.

## Drivers of change

### Climate change

- Aquifer recharge will be reduced. Hotter, drier summers will offer less rainfall and increased evaporation rates. Rainfall events in the winter may be increasingly concentrated in major downpours, much of which could be lost to surface run-off. Pollution incidents may also increase as a result of failed drains and rapid run-off during storms.
- Water-dependent chalk streams and springs and wetland habitats are vulnerable to low groundwater levels and their resilience is already reduced by historical low flows along many streams. Unpredictable and frequent periods of drought and flood will give rise to erratic flows and difficulties in managing flows. There may be downstream migration of stream heads and winterbourne sections. Water quality may also deteriorate as a result of high temperatures, lower oxygen levels and polluted run-off during storm events.
- Thermal stress will also impact on a range of species, especially those near or at the southern limit of their range. This is exacerbated where connectivity to upstream habitats or other catchments is inhibited.
- Livestock may be kept off the open downs to prevent exposure to extreme weather conditions; leading to under-grazing.
- Climate change favouring a longer growing season will exacerbate the problem of scrub and woodland encroachment onto valued open features such as downland and common land. Viewpoints, landmarks and historic features such as burial mounds and boundaries will become more rapidly obscured.
- More frequent drought increases the risk of fire in semi-natural habitats and will tend to depress agricultural productivity. With increasing warmth, new crops and varieties and cropping patterns and livestock systems may emerge.
- Trees in exposed positions, particularly within parkland, orchards, hedgerows and small woodlands, will be vulnerable to sun scorch, crown/root die back and windthrow. Associated lichen, fungi and invertebrate interest will also be affected. Loss of landmark trees will be particularly significant.
- Native beech woodlands will be affected. Survival rates of beech will vary depending upon underlying soils, with trees on the free-draining soils of northern facing slopes/coombes likely to fare better than some of the stands on the thinner soils of the south facing slopes. Where beech fails, there will be a change in species composition as more drought tolerant species prevail naturally or are planted. Beech dependent species, including fungi and invertebrates, will be disproportionately affected.
- High temperatures and summer drought are expected to reduce the species diversity of chalk grassland. Younger calcareous grasslands composed of fast-growing or short-lived species are likely to be more vulnerable than older calcareous grasslands (Grimes et al 2000). South-facing habitats will suffer greatest exposure to increased solar radiation.
- The fragmented and small size of some habitats in the Chilterns, including chalk grassland and common land habitats reduces their resilience to threats. The wider heterogeneity of the landscape offers a variety of aspects, such as hedgerows, as 'movement corridors' that will assist more mobile species in finding more favourable conditions.



- Climate change adaptations to building design will give rise to new features in the built environment, particularly where encouraged by schemes such as the Chilterns Buildings Design Award.
- Mild winters may lead to greater visitor numbers in the winter. Surfaces of access routes will be damaged by increased pressure following waterlogging and result in rapid run-off.
- Smallholders and non-farmers own a significant proportion of land and may potentially convert agricultural land to non-productive land uses, for example horse paddocks and gardens.
- Land purchases driven by perceived development opportunities will give rise to land falling into disuse or temporary uses whilst awaiting development. This will be particularly acute in the urban fringe and especially in growth areas.

## Other key drivers

- Growth areas affecting the NCA include Milton Keynes-South Midlands and Cambridge-Stansted-Peterborough. Further development and infrastructure elsewhere is also possible, such as along major railways and at Luton airport. Development will alter the appearance of the landscape and may reduce the sense of tranquillity. There will be associated demands on a variety of ecosystems in the area, including water availability and accessible green space.
- Agricultural and forestry economics will continue to shape the character of the rural landscape. Scrub and woodland encroachment upon open areas including downland may continue as livestock numbers decline and viability of sheep and cattle farming remains limited. In contrast, demand for wood fuel may bring unmanaged woodlands into production and galvanise efforts to manage deer. Demand for arable products will remain and may increase, encouraging deer management and demanding limited hedgerow management. Agri-environment schemes will continue to support sustainable agriculture.



People are attracted to chalk streams such as the Hughenden Stream as they pass through settlements and greenspaces.



- Demand for recreation opportunities and associated visitor facilities will see changes to infrastructure in the countryside and possible deterioration of access routes, infrastructure and landscape features at the most popular locations. High visitor numbers may detract from visitors' experiences.



Easy access routes are established in the Chilterns.

- Visitors to the countryside may be unfamiliar with the countryside and may behave inappropriately. Visitors will require visitor information and signage to assist them. In addition, some visitors will be deterred by livestock in the countryside and others may worry livestock. As such, visitors present a particular challenge to grazing management of publicly accessible land.
- Interest groups will challenge the management of features in the landscape that they value, with tree clearance, fencing and new development being sensitive issues. Management of common land, for example, will require consultation and negotiation with the public. Demand for water at a local and regional level will impact the Chilterns groundwater resource and its management. Related impacts upon chalk streams will arise.
- Pests and diseases will influence woodland and cropping choices, giving rise to new woodland species compositions and new crops. The impact of disease upon ash trees may be significant in the Chilterns since ash is the second most common species after beech.
- Farming will increasingly incorporate measures that are resource efficient and prevent pollution. This will introduce new features, potentially at a catchment scale, including buffer strips and water storage reservoirs.

## Supporting document 3: Analysis supporting Statements of Environmental Opportunity

The following analysis section focuses on a selection of the key provisioning, regulating and cultural ecosystem goods and services for this NCA. These are underpinned by supporting services such as photosynthesis, nutrient cycling, soil formation and evapo-transpiration. Supporting services perform an essential role in ensuring the availability of all ecosystem services.

Biodiversity and geodiversity are crucial in supporting the full range of ecosystem services provided by this landscape. Wildlife and geologically-rich landscapes are also of cultural value and are included in this section of the analysis. This analysis shows the projected impact of Statements of Environmental Opportunity on the value of nominated ecosystem services within this landscape.



Community groups conserve and celebrate the area.

Statement of Environmental Opportunity	Ecosystem Service																			
	Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity	
SEO 1: Manage the wooded landscape, the woodlands (including internationally important Chilterns beechwoods), hedgerows, commons and parklands with the aims of conserving and enhancing biodiversity and the historic landscape and its significant features; maximising the potential for recreation; and securing sustainable production of biomass and timber.	↔ ***	↗ **	↗ *	n/a	↗ **	↗ **	↔ *	↗ **	↗ **	↗ **	↗ **	n/a	n/a	↗ ***	↗ ***	↘ *	↗ **	↗ **	↖ **	
SEO 2: In pockets of historic land use where natural and cultural heritage are both particularly rich, aim to restore and strengthen the historic landscape, ecological resilience and heterogeneity, and to conserve soils. Ensure that species-rich habitats are conserved and extended, including internationally important species-rich Chiltern downland. Secure environmentally and economically sustainable management to ensure conservation in the long term.	↔ *	↔ **	↗ **	n/a	↔ **	↔ **	↗ **	↗ **	↗ **	↗ **	↗ ***	n/a	n/a	↗ ***	↗ ***	↔ **	↗ **	↗ ***	↗ **	

Note: Arrows shown in the table above indicate anticipated impact on service delivery: ↑ = Increase ↗ = Slight Increase ↔ = No change ↘ = Slight Decrease ↓ = Decrease. Asterisks denote confidence in projection (\*low \*\*medium\*\*\*high) ° symbol denotes where insufficient information on the likely impact is available.

Dark plum = National Importance; Mid plum = Regional Importance; Light plum = Local Importance

Statement of Environmental Opportunity	Ecosystem Service																			
	Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquillity	Recreation	Biodiversity	Geodiversity	
SEO 3: Conserve the Chilterns’ groundwater resource, River Thames and chalk streams by working in partnership to tackle inter-related issues at a catchment scale and also across the water supply network area. Seek to secure, now and in the future, sustainable water use and thriving flood plain landscapes that are valued by the public.	↘ *	↔ ***	↑ **	n/a	↔ **	↗ *	↑ ***	↑ ***	↑ ***	↑ ***	↔ **	n/a	n/a	↑ ***	↔ ***	↔ ***	↑ ***	↑ ***	← **	
SEO 4: Enhance local distinctiveness and create or enhance green infrastructure within existing settlements and through new development, particularly in relation to the urban fringe and growth areas such as Luton. Ensure that communities can enjoy good access to the countryside.	↔ **	↔ **	↗ *	n/a	○	↗ *	↗ **	↗ *	↔ **	↗ **	↗ **	n/a	n/a	↑ ***	↗ *	↘ **	↑ ***	↗ *	↗ *	

Note: Arrows shown in the table above indicate anticipated impact on service delivery: ↑ = Increase ↗ = Slight Increase ↔ = No change ↘ = Slight Decrease ↓ = Decrease. Asterisks denote confidence in projection (\*low \*\*medium \*\*\*high) ° symbol denotes where insufficient information on the likely impact is available.

Dark plum = National Importance; Mid plum = Regional Importance; Light plum = Local Importance



Landscape attribute	Justification for selection
Chalk and periglacial landforms and features, including a prominent escarpment and dry valleys.	<ul style="list-style-type: none"> <li>■ Adjacent to the clay vales, the Chalk escarpment is an abrupt change in elevation, 300 m above the Vale of Aylesbury. It stands as a distinctive relief feature visible from miles around. Extensive views are provided by the ridge, particularly from open downland.</li> <li>■ The views and experiences across this landscape are variable, as a result, in part, of landform. The enclosed nature of small valleys contrasts with the extensive views and open landscape on parts of the scarp and ridges.</li> <li>■ The crest line of the escarpment becomes progressively lower towards Hertfordshire, in the north-east, where it was overridden by ice sheets during the Anglian glaciation.</li> <li>■ Exposed Chalk is infrequent and woodland cover is extensive; however, the underlying bedrock is made prominent by the few local landmark carved figures, for example Whiteleaf Cross. The few Chalk exposures provide access to key Cretaceous sequences and yields important fossils.</li> <li>■ The numerous valleys across the dip slope create topography of alternating ridges and valleys, steep slopes and narrow valley floors. Some of these valleys are dry, while others are coursed by chalk streams with intermittent headwaters.</li> <li>■ Sarsen stones (post-glacial sandstone blocks of Tertiary age) are known only at a few locations, for example Bradenham.</li> <li>■ The Chilterns is part of a larger Chalk mass which functions as an aquifer. Unconfined areas of Chalk in the Chilterns represent key areas for re-charge (and pollution) of the aquifer. In addition to supplying local demand, the aquifer provides for London and the Thames.</li> </ul>
River Thames valley and associated settlements including the important landforms of the Goring Gap and gravel river terraces.	<ul style="list-style-type: none"> <li>■ The River Thames is culturally significant nationally and links the Chilterns to other NCAs within its catchment. Locally, it is an important recreational resource, a focus for settlement, an area of wetland interest and a major landscape feature.</li> <li>■ The Goring Gap is a well-known landform created by the River Thames carving a passage through the Chalk ridge.</li> <li>■ Quaternary deposits here are famous type localities for Thames' river terraces, aiding our understanding of the evolution of the Thames' course through geological time.</li> <li>■ Being an important communication route and cultural attraction, historic features along the Thames are significant. There is a concentration of prehistoric monuments in the Thames Valley and internationally important prehistoric artefacts have been found in gravel terraces; for example, at Cannoncourt Farm Pit SSSI.</li> <li>■ The Thames was also a focal point for some of the region's finest houses and associated parkland and designed landscapes. Distinctive river frontages and 'summer homes' from the 19th century are a feature of Thames-side towns such as Marlow.</li> </ul>



Landscape attribute	Justification for selection
A diversity of semi-natural habitats and species special to the Chilterns.	<ul style="list-style-type: none"> <li>■ A variety of soils which broaden the range of habitats beyond those typical of the Chalk. The extensive clay-with-flint deposits support acid heathland, grassland and woodland.</li> <li>■ The Chiltern soilscape makes it possible for all native beechwood types to be present and also for small examples of rare chalk heath which comprise both acid-loving and calcareous plants. There are the dry beechwoods on acid soils; the oak-beech woods on heavy clays; and the beechwoods on thin, chalky rendzina soils.</li> <li>■ Nationally important extremes of the beechwood series, the yew woods and box woods, are also present. Important wet habitats which contrast with the dry habitats on chalk; watercourses, springs and limited areas of fen and meadow are found in some valleys and along the foot of the scarp.</li> <li>■ A few small areas of calcareous fen exist at Pitstone and Bledlow and, in the Thames Valley, there are SSSI wet meadows and fens between Henley and Cookham. Ponds form on impermeable clay-with-flint deposits and there are also man-made features including the Grand Union canal, mineral extraction pits and reservoirs such as Tring Reservoirs SSSI. The Thames and its valley represent the largest wetland feature and the Chess is the most significant of the chalk streams..</li> <li>■ Downland, common land, meadow, parkland and woodland have created diversity of habitat at a local scale. Common land often exhibits features resulting from different land management practices, including wood pasture, heathland/grassland and secondary woodland; for example, Naphill Common SSSI and Frithsden Beeches SSSI.</li> <li>■ The red kite and deer are numerous in this area and, as a consequence, have become strongly associated with the Chilterns.</li> <li>■ There are several rare or scarce species associated with the Chilterns. Grassland plant species include Chiltern gentian, fringed gentian, early gentian, wild candytuft, monkey orchid, and military orchid. Woodland species include firecrest, a number of scarce deadwood beetles and flies and also fungi such as Devil's or Satan's bolete, old man of the woods, and <i>Inocybe patonillardii</i>. Box woodlands support a number of rare lichens and liverworts. Chalk stream species include the water vole and cowbane.</li> </ul>

Landscape attribute	Justification for selection
<p>One of the most wooded lowland landscapes in the country, distinguishing the Chilterns from other more open chalk landscapes.</p>	<ul style="list-style-type: none"> <li>■ The Chilterns is one of the most wooded lowland landscapes in the country with over 23,000 ha of woodland covering 14 per cent of the NCA. The majority of woodland is broadleaved and much is native beechwood.</li> <li>■ Over half the woodland resource is ancient. Extensive areas of woodlands have remained uncleared for centuries, particularly on steep slopes and over clay-with-flint deposits.</li> <li>■ A variety of elements create this wooded landscape – farm woodlands, productive forestry, wooded commons, parklands (including designed woodlands, groves and tree avenues), orchards, hedgerow trees, field trees, hedgerows, gardens and roadside trees.</li> <li>■ The Chilterns has the greatest extent of native beechwoods in the country. Chilterns Beechwoods SAC represents a major resource at over 12,000 ha. There are 'hanging' beechwoods on the upper slopes of the valley sides and on the scarp. Plantation beechwoods are renowned for their 'cathedral like' qualities.</li> <li>■ Woodlands and hedgerows contribute to the seasonal variations in colour and are widespread enclosure elements creating a sense of intimacy and secrecy. There is a wealth of species in the typical Chiltern hedgerow including many typical of ancient woodland - hazel, field maple, holly, ash, elm, rose, dogwood, blackthorn, spindle, whitebeam and wild clematis.</li> <li>■ The beechwoods have inspired artists and writers; for example, Paul Nash's painting 'Wood on the Downs'.</li> <li>■ A strong association with the history of the country's furniture industry, particularly chairs, including the 'Windsor Chair', which relied upon local woodland products.</li> <li>■ The dense shade cast by some beechwood types supports a unique ground flora community including saprophytic orchids.</li> <li>■ Secondary woodland, for example on commons, has greater biological interest than would normally be expected because of its origin from natural succession of chalk downland or old wood pasture with scattered pollards; for example, Naphill Common SSSI and Ashridge Commons and Woods SSSI.</li> </ul>

Landscape attribute	Justification for selection
<p>An ancient landscape of commons, downland, woodland and field boundaries, fragments of preserved ancient land use patterns, historic monuments, settlements and routeways dating from prehistory to the more recent past.</p>	<ul style="list-style-type: none"> <li>■ The historic environment includes bronze-age barrows and field systems; iron-age forts and dykes; pre-Roman 'co-axial' patterns of parallel trackways and fields; Roman roads and villa sites; medieval churches, field patterns, strip lynchets and deer enclosures; ancient coppice woodlands; 18th century sawyer pits and parklands; and 20th century military trenches and 'Metroland'.</li> <li>■ Prehistoric monuments are concentrated along two nationally significant historic communication routes passing through the Chilterns – the Ridgeway and the Thames.</li> <li>■ Some ancient features are widespread and can be accessed and enjoyed by the public – ancient woodland, ancient boundaries, historic routeways including 'holloways', historic field and settlement patterns, manorial wastes and commons. In the half of the NCA designated the Chilterns AONB, 45 per cent of the landscape is of pre-18th century origin and 42 per cent of fields are pre-18th century.</li> <li>■ Nucleated settlements with historic cores are associated with watercourses and springs. Despite significant 20th-century development, some settlements appear little changed, for example the historic village of Turville. Medieval flint churches are numerous.</li> <li>■ Common land accounts for 2,179 ha, or 2 per cent of the area, and ancient woodland 12,113 ha or 7 per cent of the NCA. Historic downland is almost exclusively found along the scarp and accounts for 2 per cent of the area of the Chilterns AONB. As well as preserving historic land use patterns, such areas of ancient downland, common land and woodland are also rich with historic features, including scheduled monuments.</li> <li>■ Ancient woodlands contain features associated with the industry, including the local furniture industry that was at its peak in the 19th century. Secondary woodland also preserves features pre-dating woodland cover; for example, Boddington hill fort.</li> <li>■ Many places have a long history of management. On commons, for example, there can be remnants of previous land uses within secondary woodland, including wood pasture, heathland glades and ponds. Chiltern commons have historically been managed for all their naturally occurring resources including as wood pasture, woodland, deer park, pannage and for mineral extraction.</li> <li>■ Around 40 per cent of hedged field patterns in the Chilterns are thought to have pre-18th century origins, with distinctive Saxon parish boundaries surviving along the scarp. The Black Hedge near Great Hampden and the Hundreds boundaries are significant Anglo-Saxon features.</li> <li>■ There are 4,696 ha of Registered Parks and Gardens over 40 sites, many being visually prominent in the landscape and accessible to the public. Parkland can contain both biodiversity interests, including woodland, veteran trees, grassland and heathland, and historic features surviving from pre-existing landscapes.</li> </ul>

Landscape attribute	Justification for selection
Fragmented species-rich chalk grassland on steep slopes, supporting rare plants and scrub communities including juniper, box and numerous orchids.	<ul style="list-style-type: none"> <li>■ The resource is less extensive and more fragmented than other areas known for chalk grassland. This is the consequence of the unique combination of complicated topography, distribution of other habitats and pattern of land use over the centuries.</li> <li>■ Chiltern grasslands are distinctive where they have a very short, highly diverse turf. A large number of rare and scarce vascular plant species have been recorded that are uncommon across other south England chalk grasslands. Several plant species are strongly associated with the Chilterns: Chiltern gentian, early gentian, fringed gentian, greater pignut. Many rare orchid species have been found and there are strong populations of some rare species such as the pasque flower at Barton Hills National Nature Reserve.</li> <li>■ There are rich communities of invertebrates, liverworts and mosses including specialists of box and juniper scrub. Duke of Burgundy, small blue and chalkhill blue are butterflies of restricted distribution in the Chilterns.</li> <li>■ Rare scrub communities include very important UK examples of lowland juniper scrub at Aston Rowant SSSI and Roughdown Common SSSI, and one of three sites in the country for native box scrub at Ellesborough and Kimble Warren SSSI.</li> </ul>
Red brick and flint buildings are distinctive.	<ul style="list-style-type: none"> <li>■ Settlement pattern and local vernacular building styles contribute greatly to the landscape character and a sense of history. Traditional building materials of brick and flint were historically used in all settings, from the farmstead to the village and town, and include churches, boundary walls and railway stations. Brick and flint continue to be used in some modern constructions.</li> <li>■ Variations in the use of brick and flint create interest. Brick was often made locally, giving rise to variations of red colour, texture and quality. Bricks of varying colours and glazes were used to create ornamental details. Some buildings, including churches, may be constructed entirely from flint. The proportion of brick to flint is variable, as is the style.</li> <li>■ Areas of 20th century development have introduced other styles and materials that can be dominant over the traditional character.</li> </ul>

Landscape attribute	Justification for selection
Localised and occasionally modified chalk streams.	<ul style="list-style-type: none"> <li>■ Chalk streams and associated wetland habitats occur in an otherwise dry landscape and support a high diversity of plants and animals. Further importance is attached to them as globally scarce habitats confined mainly to England and north-west Europe. There are unique assemblages of plants associated with winterbourne sections.</li> <li>■ In the half of the NCA designated the Chilterns AONB, important biodiversity is recognised by two SSSI and 30 Local Wildlife Sites which incorporate sections of chalk river.</li> <li>■ Chalk streams only occur where groundwater reaches the surface in the chalk valleys and along the foot of the scarp. Chalk streams in the valleys tend to be minor landscape features except in the case of the Chess. Some watercourses are intermittent at their headwaters, for example the River Misbourne, or along entire stretches, such as Hamble Brook.</li> <li>■ Numerous springs and watercourses arising at the foot of the scarp.</li> <li>■ The River Lee passes through Luton and the River Wye through High Wycombe. Rivers are often near to major roads following the valley floors and consequently have a long history of modification and pollution to the extent that no Chiltern chalk stream can be considered to be 'natural'.</li> <li>■ Water meadows are found alongside the River Chess.</li> <li>■ A localised feature, chalk streams are significant for their local biodiversity, history and community interest. There are six local community groups dedicated to the conservation of Chiltern chalk streams. Riverside urban green spaces and Barton Springs, for example, draw visitors.</li> <li>■ Historic features include water cress beds along the Alderbourne and Chess, ornamental lakes as at Shardeloes, and mill remains.</li> </ul>



Landscape attribute	Justification for selection
<p>An agricultural landscape of cereals and livestock intimately mixed with woodland and defined by ancient hedgerow boundaries.</p>	<ul style="list-style-type: none"> <li>■ A patchwork land use pattern of woodland and farmland. At the farm scale, there is often a mix of woodland and farmland, with woodlands having historically been a useful resource for the farm itself.</li> <li>■ Much of the patchwork land use pattern is intricate because it has the ancient characteristics of being small-scale, irregular and defined by ancient boundaries and routeways. Today, the farmed landscape dominates land use, combined with very high woodland cover. Grade 3 land accounts for 66 per cent of the NCA and dictates a mix of arable and livestock farming.</li> <li>■ Livestock numbers have been in decline but livestock farming continues and helps conserve remaining areas of downland and meadow. There are no rare/traditional breeds particularly associated with the Chilterns.</li> <li>■ Orchards and watercress beds remain as relicts of once significant local industries.</li> <li>■ Despite a dramatic decline in the last 50 years, the Chilterns still stands out as a national stronghold for arable weeds including pheasant's eye, ground pine, broad-leaved cudweed and rough mallow. Areas of less intensive agricultural land, for example field margins, host these species.</li> <li>■ A 2002 survey in the Chilterns AONB found that there are nationally important populations of farmland birds including corn bunting and linnet. Above average populations of skylark and yellowhammer were also found. However, species such as stone curlew are no longer present.</li> <li>■ Species-rich grassland is present in the farmed landscape on limited areas of downland and meadow. In the part of the NCA designated the Chilterns AONB, a survey in 2006 and 2007 identified that there were many veterans amongst the hedgerow trees and 38 per cent of hedgerows surveyed were in good condition.</li> </ul>

Landscape attribute	Justification for selection
<p>Features linked to recreation are widespread, including an extensive rights of way network, open access land, horse paddocks and golf courses.</p>	<ul style="list-style-type: none"> <li>■ Areas of downland and the numerous scattered commons are designated as open access land. The extensive woodland resource also contributes to the area of open access. Open country includes key locations along the scarp, providing access to magnificent views, species-rich grassland and scheduled ancient monuments.</li> <li>■ Commons are key green spaces within the villages, towns and larger urban areas and are scattered across the NCA. They are particularly important in more developed areas such as the Thames Valley, for example Cookham commons, and on the edge of London at places such as Chorleywood and Harpenden.</li> <li>■ Popular visitor sites include Ashridge, Coombe Hill, College Lake, Tring Reservoirs, Wendover Woods, Dunstable Downs, Pegsdon Hills and Barton Hills. Recreation infrastructure including car parks, visitor centres and signage are associated with some popular green spaces, such as Dunstable Downs. Areas of tranquillity are significant in a landscape that is near to London, cut through by major transport routes and subject to development pressures. The scarp plateau, especially in the south, is the most tranquil area.</li> <li>■ Accessibility by road has not been upgraded from single track lanes in some places and such areas feel 'secret' and tranquil; for example, Bix Bottom near Henley and Radnage Valley near High Wycombe. It is also possible to 'escape' where there are significant enclosure features such as narrow valleys, woodland, holloways and hedgerows.</li> <li>■ The rights of way network is considered good. There are promoted routes incorporating all the key landscape attributes of the Chilterns, including 'Access for All' routes in the Chilterns AONB. Promoted routes include two National Trails – the Thames Path and the Ridgeway - towpaths along the Grand Union Canal and National Cycle Network routes.</li> <li>■ Water-based recreation is possible along the Thames and Grand Union Canal, including fishing, boating, canoeing and birdwatching. Limited access is provided to the chalk streams, for example, Barton Springs is on open access land.</li> <li>■ With over 10 million people living within an hour's drive or train journey, many people can benefit from the tranquillity and recreation opportunities of this area.</li> <li>■ Areas of recreational use comprise over 2 per cent of the Chilterns AONB and consist of golf courses, playing fields, theme parks and zoos. The largest of these categories is golf courses. Some Registered Parks and Gardens are accessible to the public at cost, including National Trust properties such as Hughenden Manor and Greys Court.</li> <li>■ In the half of the NCA designated the Chilterns AONB, a survey suggests that 5 per cent of the AONB is used for equestrian purposes and there are promoted horse riding routes. Subdivision of fields into paddocks is particularly evident near settlements.</li> </ul>

Landscape attribute	Justification for selection
<p>A settled landscape with 20th century development associated with major transport routes, but with small-scale, dispersed settlement and single track country lanes found off main routes.</p>	<ul style="list-style-type: none"> <li>■ Settlement is dispersed and there are major transport routes passing through the area. The built environment is therefore very much part of the Chiltern landscape, although the level of development varies across the NCA.</li> <li>■ Good lines of communication with nearby London have been critical to the development of the area and also essential to a wider transport network which links London to the Midlands and the North. Beginning with the turnpike trust improvements to the main routes during the 18th and 19th centuries, links have been strengthened and include London's transport network of the Grand Union Canal, railway lines and several motorways.</li> <li>■ Some settlements have been a particular focus for 20th century development due to their proximity to London and major transport routes. 'Metroland', which incorporates Amersham for example, was specifically developed and promoted in the early 20th century as a residential area for London commuters on the Metropolitan line. One of the first 'new towns' in the NCA, Hemel Hempstead, was designated in 1947.</li> <li>■ Very limited 20th century expansion is found where the road network is small-scale. The plateau and valleys south of the M40 is a large area characterised by single track lanes and scattered farmsteads, hamlets and small villages.</li> <li>■ In 2003, approximately 41 per cent of the NCA was included in the London Metropolitan Green Belt.</li> </ul>
<p>Frequent grand country houses and designed landscapes occupy prominent positions.</p>	<ul style="list-style-type: none"> <li>■ The proximity to London and Windsor attracted the landed elite in the 18th and 19th centuries. Grand country houses and parks reached their peak at 600 in 1820. Today 3 per cent of the NCA is included in the Register of Historic Parks and Gardens.</li> <li>■ Designed landscapes of the 18th century, for example Tring Park and Ashridge, are best known and include works by Bridgeman, Repton and Brown. Some are associated with high profile figures including Chequers, the Prime Minister's rural home, and Hughenden, a home of Victorian Prime Minister Disraeli.</li> <li>■ Public access is possible to many country houses and landscapes, including properties owned by the National Trust and others.</li> </ul>

## Landscape opportunities

- Protect the character and integrity of the rural landscape, by conserving the combination and balance of key assets; boundary features, semi-natural habitats, tranquillity and historic buildings.
- Identify and conserve views to and from key and popular viewpoints and landmarks by careful design and vegetation management, minimising the impact and effects of development, woodland planting and scrub encroachment.
- Conserve the patchwork land use pattern, valued farmland species and productivity of the landscape by securing sustainable forestry and mixed agricultural activity. This includes conservation of small farm woodlands, historic hedgerows, farmland birds, woodland birds and arable weeds.
- Plan and manage private and public spaces for recreation, such as golf courses and hobby farms, so that their design and their features positively contribute to landscape character. Seek the conservation, restoration and creation of natural and cultural features in these landscapes.
- Secure sustainable development which also reflects traditional local building styles and materials both within and outside the AONBs of the Chilterns and North Wessex Downs. Where landscape character and features are degraded by development, identify opportunities to re-develop areas and infrastructure, for example; re-modelling canalised sections of river and restoring key views.
- Conserve the range and mosaic of habitats found in the landscape by protecting traditionally managed or relict features such as chalk grassland, coppice woodland, orchards, laid hedgerows, veteran and ancient trees and commons.
- Support marginal and localised land management practices and develop 'products' attractive to modern consumers, including leisure products, local brands and wood fuel.
- Seek to reduce threats to natural and historic features by conserving or restoring their setting, addressing the problem of fragmentation particularly associated with chalk grassland and common land. Work at a landscape scale which reflects the ecosystem approach, ecological network approach and historic landscape character areas.
- Conserve, enhance and create new public access infrastructure, access links and accessible natural and cultural features, particularly near to settlements, in order to enhance the transitional areas between town and countryside and conserve tranquillity. Undertake appropriate visitor management to ensure sustainable visitor pressure at all sites but particularly focus upon 'honey pot' sites and those sites near to new development. Identify and promote alternative green spaces and entry points to reduce visitor pressure.

## Landscape opportunities continued

- Conserve the extensive woodland cover and diversity of wooded features, particularly the ancient woodlands, native beech woodlands and wooded features in designed landscapes, in order to conserve the sense of place, biodiversity and historic landscape. Restore plantations on ancient woodland sites. Plan to improve the understanding of the extent and management requirements of the rare yew and box woods. Plan to build the resilience of woodlands to climate change impacts, particularly the valued beech woodlands which are vulnerable. Consider new species compositions and secure woodland across a variety of aspects.
- Engage landowners and managers of parklands in the management of trees and woodlands, particularly those outside grant schemes and those that are 'At Risk'. Conserve the best examples and variety of Chiltern parklands, maintaining their legibility and contents and ensuring management brings about positive outcomes for access and interpretation, biodiversity and the historic record. Manage veteran and ancient trees, woodlands and grasslands in parklands to strengthen biodiversity value.
- Conserve ancient routeways and existing hedgerow boundaries across the landscape to conserve boundary patterns and biodiversity. Create new hedgerow boundaries to fields and routeways to restore historic field patterns and benefit biodiversity. Carry out targeted surveys and possible Local Wildlife Site designation to conserve species-rich hedgerows and identify hedgerow trees of significant landscape and biodiversity value.
- Protect chalk streams and wetlands through securing sustainable levels of water abstraction and through pollution prevention measures in both their rural and urban settings. Harness catchment-scale approaches, recognising the entire length of chalk streams and groundwater resources. Pursue Local Wildlife Site designation to secure protection as appropriate.
- Manage the flood plain of chalk streams, including historic features such as watercress beds and channels, in order to conserve and create wetland habitat, filter runoff; and store water. In the urban environment, seek to restore degraded channels and extend the area of green space surrounding rivers for biodiversity, flood alleviation and public access benefits.
- Manage recent change in the landscape by establishing a dialogue with growing stakeholder groups, particularly hobby farmers, horse-owners and non-farmers owning significant areas of land and valued features. Develop best practice management guidance to disseminate to these growing audiences.
- Build on existing community interest and activity around chalk streams and common land to secure further improvements.
- Create urban fringe areas that deliver a variety of functions and contribute positively to sense of place. Create strong visions which help to manage land that is 'awaiting development'.



## Ecosystem service analysis

The following section shows the analysis used to determine key ecosystem service opportunities within the area. These opportunities have been combined with the analysis of landscape opportunities to create Statements of Environmental Opportunity.

Please note that the following analysis is based upon available data and current understanding of ecosystem services. It does not represent a comprehensive local assessment. Quality and quantity of data for each service is variable locally and many of the services listed are not yet fully researched or understood. Therefore the analysis and opportunities may change upon publication of further evidence and better understanding of the inter-relationship between services at a local level.

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Food provision</b>	Soils, particularly Grade 1 and 2 land	Approximately two thirds of the area is described as having Grade 3 land. There are significant areas of Grade 1 and 2 land on valley floors and along the foot of the scarp.	National	Soils on Grade 3 agricultural land are suited to both cereals and livestock farming, hence the mixed farmed landscape. However, ongoing declines in sheep numbers reduce the capacity for local farming systems to sustain the traditional grazed downlands.	With approximately 10 million people living within an hour's travelling time of the Chilterns (including London), there are opportunities to build consumer markets around locality foods and rare livestock breeds linked to farming systems that conserve the Chilterns landscape.	<b>Food provision</b> <b>Sense of place</b> <b>Biodiversity</b> <b>Regulating soil quality</b> <b>Regulating soil erosion</b> <b>Regulating water quality</b> <b>Water availability</b>
	Arable farming					
	Livestock production	Cereal production accounted for 40 per cent of farmed area, almost the equivalent area, 37 per cent, was grass or uncropped land <sup>8</sup> . Farming is less mixed in Hertfordshire where arable dominates <sup>9</sup> . In the Chilterns AONB, a 2008 survey found wheat growing on 50 per cent of cropped land; barley on 20 per cent and oilseed rape on 11 per cent <sup>10</sup> .		The steep slopes of the scarp and valleys (often Grade 4 land) are difficult to cultivate. However, cultivated sloping land with shallow chalk soils are at risk of erosion.. Steep slopes under permanent pasture reap benefits for regulating soil erosion, for biodiversity and sense of place.	Improving the economics of sustainable livestock farming could bring important benefits to biodiversity and sense of place, if associated with targeting graziers to biodiverse grasslands.	
	Aquifer					
	Grassland			Grade 1 and 2 land accounts for about 10 per cent of the NCA and is the most highly versatile, often growing high value arable crops.		
				<b>Continued on next page...</b>		

<sup>8</sup> *Agricultural Census*, Department for Environment, Food and Rural Affairs (2010) <sup>9</sup> *Land Cover Map*, Centre for Ecology and Hydrology (2000)

<sup>10</sup> *Chilterns AONB Land Use Survey 2008*, Chilterns Conservation Board (2008)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision		There are several vineyards and micro-breweries in the area. In 2009, livestock numbers had dropped since 2000 with just below 54,500 sheep, just over 28,000 cattle and approximately 21,500 pigs.		<p>... continued from previous page</p> <p>Despite the history of sheep grazing on the downlands, the Chilterns is not associated with any traditional rare breeds and there are also no locality foods recognised at a regional or national level<sup>11</sup>.</p> <p>Orchards are an important feature in the landscape, but are largely relict.</p> <p>Arable and vegetable production occasionally requires abstractions from groundwater and surface waters, sometimes to provide for spray irrigation.</p> <p>Climate change may encourage the expansion of vineyards in the Chilterns.</p>	<p>Resource-efficient farming should be encouraged and risks identified and managed to reduce negative impacts upon water resources, for example, arable reversion should be targeted to areas of high soil erosion risk and fertiliser use minimised where infiltration into the aquifer is rapid.</p> <p>Opportunities should be sought to bring relict orchards back into management for food, sense of place and biodiversity benefits.</p>	

<sup>11</sup> *Exploration of the Relationship between Locality Foods and Landscape Character*, C. Trewin and L. Mason (2006; Land Use Consultants)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Timber provision</b>	Beech and conifer woodland  Coppice	Woodland is found across 14 per cent of the NCA <sup>12</sup> (or 21 per cent of the Chilterns AONB <sup>13</sup> ), making this one of the most wooded lowland areas in England and with a potential annual production of 60,000 tonnes <sup>14</sup> .  There is approximately 7,000 ha of conifer plantation and 14,000 ha of broadleaved woodland.  1,560 ha of woodland in the public forest estate is managed outside of woodland grant schemes for timber and other ecosystem services.	Local	During the 18th and 19th centuries, Chiltern woodlands provided a steady supply of beech wood to a significant local furniture industry. Today, timber production is largely limited to conifer woodlands.  The more extensive broadleaved woodlands as well as hedgerow trees, parkland trees and field trees are not commonly managed for timber production. The woodland resource is undermanaged, with problems of over-stood coppice, a lack of thinning and over-mature beech.  Various factors make forestry commercially unviable but particular issues in the Chilterns are the prevalence of beech which has a limited market and costs associated with pests, principally deer and grey squirrel <sup>15</sup> . Infrastructure, such as local sawmills, and the local skilled workforce once associated with this area has been in decline.	Opportunities are linked to developing local, small-scale markets and added value products, for example fencing, sustainable and local branded products, <sup>16</sup> with associated infrastructure and skills training needs being met. However, wood fuel opportunities may be greater.  Woodlands managed for timber can also be managed to provide public amenity opportunities, conserve heritage and produce biomass.	<b>Timber provision</b>  <b>Sense of place</b>  <b>Sense of history</b>  <b>Biodiversity</b>  <b>Regulating soil quality</b>  <b>Biomass energy</b>

<sup>12</sup> Natural England (2010) <sup>13</sup> Chilterns Area of Outstanding Natural Beauty: Management Plan 2008 - 2013 – A Framework for Action, Chilterns Conservation Board (undated)

<sup>14</sup> LEADER Local Action Group Local Development Strategy, Chilterns LAG (2008) <sup>15</sup> Ibid <sup>16</sup> Ibid; Seeing the Wood for the Trees, Forestry Commission (2004)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Water availability</b>	Aquifer  Watercourses	<p>Almost the entire NCA comprises a principal aquifer containing large quantities of high-quality potable water, corresponding with outcropping chalk<sup>17</sup>. It is the largest principal aquifer in the London Basin and the most significant in southern England. Abstraction volumes and development for abstraction is therefore significant<sup>18</sup>.</p> <p>The majority of volume abstracted in the Chilterns is from groundwater. This contrasts with nearby London or the Upper Thames Clay Vales where surface water abstractions dominate.</p> <p>In the northern half of the Chilterns, all the rivers and groundwater<sup>19</sup> units in the entire Colne catchment and in the Lee and Mimram management unit are 'over abstracted'.</p>	National	<p>South east England is a highly populated area with relatively low annual rainfall. It is also a region with higher than average consumption rates<sup>20</sup> and agricultural uses in the Chilterns include 'high loss' uses such as spray irrigation<sup>21</sup>. Some parts of the south-east have less useable water per person than some arid countries<sup>22</sup> and more homes are expected to be built.</p> <p>Public water supply needs, including those of London, have historically caused a greatly depressed water table and low flows in Chiltern chalk streams. Reliance upon groundwater resources will be particularly acute during periods of drought which may also coincide with increased demand by people.</p> <p><b>Continued on next page...</b></p>	<p>Opportunities to improve water availability are only effective when implemented on a large scale, with the exception being winter storage reservoirs.</p> <p>Work in partnership with water companies across the water supply network area to secure sustainable abstraction and consumption, including engaging water consumers about the negative impacts of unsustainable abstraction upon Chiltern chalk streams.</p>	<p><b>Water availability</b></p> <p><b>Biodiversity</b></p> <p><b>Regulating water quality</b></p> <p><b>Regulating water flow</b></p>

<sup>17</sup> *Baseline Report Series 6: Chalk of the Colne and Lee River Catchments*, Environment Agency and British Geological Survey (2003) <sup>18</sup> *Catchment Abstraction Management Strategy for Colne*, Environment Agency (December 2007) <sup>19</sup> There are four Catchment Abstraction Management Strategies (CAMS) applicable to the Chilterns NCA – Upper and Bedford Ouse; Upper Lee; Colne; and Thame and South Chilterns. The CAMS area boundaries and the NCA boundary do not match and so CAMS information is approximated to fit the NCA. Two-thirds of the Chilterns NCA falls into the Colne and Thame and South Chilterns CAMS areas. <sup>20</sup> *Thame and South Chiltern Catchment Abstraction Management Strategy*, Environment Agency (2007) <sup>21</sup> *Catchment Abstraction Management Strategy for the Upper Lee*, Environment Agency (June 2006) <sup>22</sup> *Underground, Under Threat – The state of groundwater in England and Wales*, Environment Agency (undated).

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Water availability cont...</b>		<p>In the south, all the groundwater units are 'over licensed' except the most southern groundwater unit in Oxfordshire which has 'no water available'. No rivers or groundwater units in the Chilterns are considered suitable for further extraction at low flows.</p> <p>Water is also imported into the Chilterns. The areas around Wycombe and Aylesbury are net importers from Thames-side sources <sup>23</sup>.</p> <p>Streams become more numerous towards the north. A large area of dip slope in Oxfordshire is without any watercourses and the two southernmost streams can be dry along their entire lengths (Hughenden Stream and Hamble Brook).</p> <p>A quarter of London's water supplies is drawn from its underlying confined aquifer which is supported by groundwater flows from the Chilterns and North Downs <sup>24</sup>. Groundwater flows in the south of the Chilterns aquifer also supply the nearby River Thames, supporting abstractions downstream including significant volumes for London <sup>25</sup>.</p>		<p>Future demand associated with residential development threatens the sustainability of abstraction <sup>26</sup>. Water companies, in partnership with the Environment Agency, are carrying out work to address low flows and secure sustainable abstraction, including closing pumping stations and installing pipelines to transfer water.</p> <p>In the four Environment Agency catchments falling within this NCA, current abstraction at low flows is causing or has the potential to cause, unacceptable environmental damage, with the exception of the dip slope in Oxfordshire and the River Thames reach which are appropriately licensed <sup>27</sup>.</p> <p><b>Continued on next page...</b></p>	<p>Where recharge potential is greatest across the aquifer, work with land owners and managers to improve soils, vegetation cover and artificial surfaces to enhance infiltration and avoid contamination from, for example, nitrates. Resolve pollution issues at source where there is rapid infiltration.</p> <p>Support sustainable water consumption and pollution prevention in the design of new developments. Ensure the water supply network can meet demand from new development in a sustainable way.</p> <p>At a catchment scale, encourage take-up of land management measures that are water efficient and minimise pollution including winter storage reservoirs, best practice irrigation and contour ploughing.</p>	

<sup>23</sup> Thames Water Utilities Ltd, personal commentary <sup>24</sup> State of the Environment Report for London, Greater London Authority, Environment Agency, Natural England and Forestry Commission (June 2011) <sup>25</sup> Thames Corridor Abstraction Management Strategy, Environment Agency (2004). The Thames Corridor CAMS covers the freshwater River Thames, from Cricklade to Teddington, and the Thames Tideway as far down as Erith. <sup>26</sup> Catchment Abstraction Management Strategy for Thame and South Chilterns, Environment Agency (March 2007); Catchment Abstraction Management Strategy for Colne, Environment Agency (December 2007); Catchment Abstraction Management Strategy for the Upper Lee, Environment Agency (June 2006) <sup>27</sup> Catchment Abstraction Management Strategy for Thame and South Chilterns, Environment Agency (March 2007); Catchment Abstraction Management Strategy for Colne, Environment Agency (December 2007); Catchment Abstraction Management Strategy for the Upper Lee, Environment Agency (June 2006); Catchment Abstraction Management Strategy for Upper and Bedford Ouse, Environment Agency (March 2005); Catchment Abstraction Management Strategy for the Thames Corridor, Environment Agency (June 2004)



Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability cont...		<p>In the 'Thame and South Chilterns' and 'Colne' catchments<sup>28</sup>, 40 per cent of total abstracted volume relates to uses other than public water supply such as agriculture, industry and recreation<sup>29</sup>.</p> <p>Secondary aquifers are associated with Quaternary gravel deposits along the Thames. There is hydraulic connectivity between the aquifer/groundwater and watercourses. Tring Reservoirs supply water to the Grand Union Canal.</p>		<p>The northern catchments which are 'over abstracted' in the Chilterns are among only 15 per cent in England and Wales considered to be in this worst state and the availability of water for surface waters are at the highest risk from abstraction<sup>30</sup>.</p> <p>This poor picture of water availability is despite the Chilterns annual rainfall being higher than the average for the region. In the southern half of the NCA, the escarpment receives 708 mm average annual rainfall, although only 287 mm reaches watercourses and the aquifer<sup>31</sup>.</p> <p>Aquifer recharge is greatest high on the escarpment, in the valleys, not on the interflaves, and at the boundary between chalk and clay-with-flint deposits<sup>32</sup>. Groundwater abstraction is concentrated in the valleys, including the River Thames. Due to hydrological continuity between the watercourses and the aquifer, abstraction from the aquifer draws water from the rivers into the chalk.</p> <p><b>Continued on next page...</b></p>		

<sup>28</sup> The Colne CAMS area and the Thame and South Chilterns CAMS area accounts for approximately two-thirds of the Chilterns NCA but the CAMS areas include additional areas outside the NCA.

<sup>29</sup> *Thame and South Chiltern Catchment Abstraction Management Strategy*, Environment Agency (2007). <sup>30</sup> *Land Use and Environmental Services*, Environment Agency (October 2009; Science Report SC080014/SR1) <sup>31</sup> *Catchment Abstraction Management Strategy for Thame and South Chilterns*, Environment Agency (March 2007) <sup>32</sup> *Baseline Report Series 6: Chalk of the Colne and Lee River Catchments*, Environment Agency and British Geological Survey (2003)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Water availability cont...</b>				<p>Abstraction risks upon the Thames are not considered significant due to its large flows but there are risks to the smaller chalk streams<sup>33</sup>. Infiltration does not take place where there are overlying impermeable deposits, for example clay-with-flint, and where fissures in the chalk are poorly developed across the high ground of Oxfordshire in the south-west<sup>34</sup>.</p> <p>Abstraction pressures contributing to low flows are currently a concern for the rivers Ver, Misbourne, Mimram and Lee. Drying and variable river levels impact upon the ecology of rivers and water-dependent habitats such as meadows and wet woodland. Downstream impacts must also be considered, particularly since Chiltern watercourses contribute water to two key river systems – the River Thames and the rivers feeding into the Ouse Washes and The Wash.</p> <p>The Thames applies a large draw on groundwater in the south, contributing to a pattern of watercourses across the dip slope that sees an absence of watercourses at the southernmost end in Oxfordshire and increasing density of watercourses northwards.</p>		
<b>Genetic diversity</b>	Orchards	Orchards in the central part of the NCA are small remnants of a historically significant local fruit industry.	Local	Predominantly out of production, these orchards may be in decline, however, they preserve a number of local and unusual varieties.	Engage owners in managing their orchards to conserve the genetic diversity they contain along with their biodiversity and cultural heritage.	<b>Genetic diversity</b>  <b>Biodiversity</b>  <b>Sense of place</b>  <b>Sense of history</b>

<sup>33</sup> Groundwater Quality Review – SW Chilterns and Twyford Brook, Environment Agency (February 2005) <sup>34</sup> Ibid

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Biomass energy</b>	Woodland  Short rotation coppice (SRC)	<p>The Energy Crops Scheme 2000-2006 did not fund any miscanthus or short rotation coppice crops in the Chilterns.</p> <p>In this heavily wooded landscape, potential yields of biomass from trees are significant from thinnings, logs, chippings and other sources.</p>	Local	<p>The firewood market is thriving locally, with sale of logs for firewood being more of a driver for woodland management than timber.</p> <p>The potential yield from miscanthus is limited, while potential for SRC yields are mainly medium. SRC (willow, poplar) is inappropriate in the Chilterns where it reduces infiltration to groundwater, particularly in areas already under water stress.</p> <p>Suitable locations for biomass production are limited by the presence of vulnerable landscape features and views and also steep terrain, although the heavily wooded landscape offers some opportunities to assimilate SRC. Miscanthus will cause least landscape change if sited where intensive arable already exists, such as on the scarp foothills and Thames Valley.</p> <p>With approximately 10 million people living within an hour's drive (including London), there is a large potential market for wood fuel both from the domestic and commercial sector, including large and numerous premises with wood fuel systems, such as Heathrow Terminal 2 and Slough Heat and Power.</p>	<p>Seek growth in the market for woody biomass which secures additional benefits to biodiversity, timber production and conservation of woodland as an important landscape feature<sup>35</sup>.</p> <p>Establish appropriate management of native beech woodlands which realises their biomass potential and also ensures the conservation of their special biodiversity.</p> <p>Work with local educational institutions and land owners to develop a skilled workforce to manage woodlands across the NCA.</p>	<p><b>Biomass energy</b></p> <p><b>Timber provision</b></p> <p><b>Biodiversity</b></p> <p><b>Sense of place</b></p>

<sup>35</sup> Chilterns AONB State of the Environment Report, Chilterns Conservation Board (2010)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Climate regulation</b>	Woodland  Permanent pasture  Wetland habitats  Historic land uses such as downland and parkland	<p>Although containing relatively low carbon concentrations, topsoils will contribute to carbon storage capacity.</p> <p>There are considerable areas of undisturbed soils supporting woodland and permanent pasture, including semi-natural chalk grassland, which are less likely to release their carbon stores and store more carbon than regularly cultivated ground. Permanent grasslands account for approximately 1,500 ha.</p> <p>Woodland cover is high across the NCA at 14 per cent, representing carbon stores in both soils and tree biomass. Wetland habitats in the valleys which may contain undisturbed peaty and/or deep soils with higher carbon storage capacity account for approximately 400 ha.</p>	Regional	<p>Soil carbon stores are limited in this NCA due to the predominance of mineral soils. However, carbon storage potential is maximised where there are undisturbed soils which have a considerable longevity of storage such as in historic downland, woodland, common land and parkland.</p> <p>The contribution that woodland makes to carbon sequestration is very limited compared to the UK's soil carbon stores and declines with increasing tree maturity. Woodland makes a greater contribution to climate regulation through reducing emissions as a provider of alternative fuels to fossil fuels.</p>	<p>The greatest contribution to be made to climate regulation will be through generating biomass fuels.</p> <p>Soil carbon stores should be conserved and well managed to maximise storage across the NCA. Incorporate organic matter, use cover crops and adopt reduced tillage techniques to improve soil structure so that there are benefits for carbon regulation, soil quality and soil erosion.</p> <p>When managing historic landscapes such as downland and parkland, avoid disturbance of soils to benefit long-established carbon stores as well as to preserve above-ground and below-ground archaeology.</p> <p>Conserve and manage ancient woodlands and their soils to maximise carbon storage while also delivering biodiversity and wood fuel benefits. Forestry activities, including planting and harvesting, should seek to minimise soil disturbance.</p> <p>Manage existing wetlands and seek to extend wetlands in order to secure the peat resource, benefit biodiversity and manage water resources.</p>	<p><b>Climate regulation</b></p> <p><b>Regulating soil quality</b></p> <p><b>Biomass energy</b></p> <p><b>Sense of history</b></p> <p><b>Biodiversity</b></p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Chalk	Natural process of water percolating through the Chalk.	Regional	<p>The NVZ and catchment sensitive farming designations reflect the importance of the area to national water quality interests and to the location of polluting activities. Due to the hydraulic connectivity between groundwater/aquifer and watercourses, pollutants can cross-contaminate.</p> <p>Groundwater in the aquifer is generally high quality but pollution is present from urban point sources, such as industry in High Wycombe, St Albans, Luton, Dunstable, and from diffuse sources, such as nitrate concentrations from farming; a particular problem in the south of the area.</p> <p>River water quality is generally good in all but one of the four catchments in the NCA, the Colne, but pollutants are present. Groundwater and surface water protection in this NCA demands filtration of pollutants in both the rural and urban setting, with particular solutions required for the Colne in relation to interactions with the canal network.</p> <p>Settlement pattern means that urban centres are adjacent to watercourses, where there is limited green space to filter pollutants from runoff. Pollutants in runoff from arable land may be intercepted by the surrounding mosaic of hedgerows, woodlands, scrub and grasslands</p> <p>Existence of very rapid flow paths within the Chalk means that groundwater is susceptible to pollution incidents from a wide range of activities and there is potential to cause widespread and long-lasting pollution of the aquifer.</p>	<p>Target the development of sustainable drainage systems / green space within and downstream of urban centres to filter pollutants.</p> <p>Work with farmers and other land managers at a whole farm and at a catchment scale to maximise and strategically locate land cover which slows and filters run-off and improves water entering the aquifer, for example through arable reversion, hedgerows restoration and planting, permanent arable field margins and strips and reedbeds.</p> <p>Work with farmers and other land managers to maintain or enhance existing field drainage to improve infiltration and slow down runoff. Avoid new drainage of existing wetlands.</p> <p>Reduce compaction and erosion in all soils, and poaching in grassland, including remedial loosening. Encourage sustainable grazing regimes on permanent pasture and rough land.</p>	<p><b>Regulating water quality</b></p> <p><b>Food provision</b></p> <p><b>Regulating soil erosion</b></p> <p><b>Regulation soil quality</b></p> <p><b>Regulating water flow</b></p> <p><b>Biodiversity</b></p>
	Watercourse	Woodland, areas of permanent pasture, cross-field boundary hedgerows and vegetated slopes found throughout the area reduce cross-ground water flow rates thereby increasing infiltration and the processes of natural filtration.				
	Vegetated slopes	94 per cent of the NCA falls into a nitrate vulnerable zone (NVZ) providing groundwater and surface water protection, and the area around Luton falls into a catchment sensitive farming priority catchment.				
	Cross-field hedgerows (in arable)					



Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Regulating water flow</b>	<p>Watercourses</p> <p>Wooded valley sides</p> <p>Vegetated steep slopes</p> <p>Water storage features, in-stream and in the wider flood plain such as wet meadows and watercress beds</p> <p>Permanent pasture</p>	<p>The middle reaches of the River Thames lie near the southern boundary of the NCA, flowing from the adjacent NCA Upper Thames Tributaries and on to London. The Thames flows across a wide flood plain offering flood storage capacity.</p> <p>The Thames Valley has a fairly high risk of flooding, with riverside settlements including Reading, Henley and Marlow susceptible. The Thames Valley also offers potential floodwater storage areas.</p> <p>Smaller scale flooding may also affect those settlements adjacent to chalk streams in the dip slope valleys but, historically low flows have been a more significant issue.</p> <p>Some watercourses are prone to drying in their upper reaches and the permeability of the Chalk means that infiltration can reduce overland flows. Five of the nine chalk streams are classified as 'heavily modified waterbodies'.</p>	Local	<p>Groundwater provides a relatively consistent flow volume to chalk streams. However, abstraction can give rise to artificial and low flow regimes which impact the ecology of rivers and water-dependent habitats such as meadows and wet woodland.</p> <p>Abstraction pressures contributing to low flows are currently a concern for the rivers Ver, Misbourne, Mimram and Lee. Treated discharges from sewage treatment works modify flows of rivers such as the Lee and Hiz.</p> <p>Low flow alleviation schemes have been implemented along several chalk streams including the Misbourne, Bulbourne and Wye<sup>36</sup>. Pumping stations along chalk streams have been closed and investigations continue along rivers such as the Wye. Chalk streams within the Chilterns AONB also benefit from the conservation activities of the Chiltern Chalk Streams Project which has been running for several years.</p> <p>Downstream impacts must also be considered, particularly since Chiltern watercourses contribute water to two key river systems – the River Thames and the rivers feeding into the Ouse Washes and The Wash.</p> <p><b>Continued on next page...</b></p>	<p>Target the development of sustainable drainage systems and green space within and downstream of urban centres to store floodwaters and filter pollutants.</p> <p>Work with farmers and other land managers at a whole catchment scale to improve soil management to aid water infiltration and to maximise and strategically locate land cover which slows and filters run-off, for example through arable reversion, hedgerows restoration and planting, permanent arable field margins, wooded slopes and reedbeds.</p> <p>Restore historic and natural features in flood plains to increase capacity for water storage, including wet meadows, watercress beds and reedbed.</p>	<p><b>Regulating water flow</b></p> <p><b>Regulating water quality</b></p> <p><b>Water availability</b></p> <p><b>Biodiversity</b></p>

<sup>36</sup> Thames Water Utilities Ltd, personal commentary

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow cont...		There are landscape features which assist infiltration and slow overland flows, including extensive broadleaved woodland and a locally dense network of hedgerows.		<p><b>... continued from previous page</b></p> <p>Across the Chalk, infiltration can reduce overland flows after rainfall events and so alleviate localised flooding. However, flooding can affect the many urban centres adjacent to chalk streams where there is significant run-off and limited flood storage space (with associated water pollution threats). The Thames can bring floodwaters into the NCA and on into London.</p> <p>Narrow valleys on the dip slope restrict flood storage capacity while the wide Thames flood plain offers some opportunity for storage. The dominance of heavily modified watercourses amongst the chalk streams means natural river processes are restricted at times of high water flows.</p> <p>Establish land cover which slows runoff in the urban and rural environments. The role that water flow management in the Upper Thames Tributaries can play in attenuating Thames floodwater will also benefit this NCA and London.</p>		

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Regulating soil quality</b>	<p>Permanent pasture</p> <p>Calcareous soils</p> <p>Grade 1, 2 and 3a land</p> <p>Soils under woodland</p>	<p>Prime agricultural land of Grades 1 and 2 is associated with the lower scarp and Thames flood plain and covers about 10 per cent of the NCA area or about 18,000 ha.</p> <p>There are soil types of a calcareous nature which are naturally resilient to drought if well managed. These are shallow lime-rich soils over chalk or limestone covering around 15 per cent of the NCA and also freely draining lime-rich loamy soils which account for just over 10 per cent of the NCA area.</p> <p>Soils across approximately half the NCA are vulnerable to compaction. These include the slightly acid loamy and clayey soils associated with the dip slope ridges (covering just over 40 per cent) and the freely draining slightly acid but base-rich soils (covering just over 10 per cent).</p> <p>There are considerable areas of uncultivated soils under woodland and grassland, some of which have been undisturbed for centuries such as ancient woodland, downland and fen. Permanent grasslands account for approximately 1,500 ha and fen 52 ha. Woodland cover is high at around 23,000 ha, of which 12,000 ha is ancient.</p>	Regional	<p>The best and most versatile agricultural land (Grade 1, 2 and 3a) is a priority for protection from loss by development. Almost half the NCA, including much of the plateau, is vulnerable to poaching and compaction and this threatens soil structure, versatility and productivity.</p> <p>The national importance of the chalk aquifer makes overlying soil structure and soil contaminants significant in terms of water filtration.</p> <p>There are significant potential pollutant sources including urban centres, roads and intensive agriculture.</p>	<p>Conserve and maximise the resource, aiming particularly to avoid deterioration of soils with high Agricultural Land Classification grades. Ensure there is good soil management in woodlands as well as across farmland.</p> <p>Across all soils, reduce soil compaction and erosion. Avoid land management practices which can lead to compaction such as over-stocking and working machinery on wet ground. Carry out remedial work such as loosening where necessary.</p> <p>Reducing intensity of tillage and encouraging use of additional sources of organic matter on intensively managed soils, such as cover/catch crops and manures, should help increase soil carbon and improve soil structure. This, with careful use of fertilisers, should help reduce nitrous oxide emissions.</p> <p>Good soil management will also benefit food production in the long term, aid infiltration to the aquifer and reduce pollutants entering surface and ground waters.</p>	<p><b>Regulating soil quality</b></p> <p><b>Regulating soil erosion</b></p> <p><b>Food provision</b></p> <p><b>Regulating water quality</b></p> <p><b>Regulating water flow</b></p> <p><b>Water availability</b></p> <p><b>Climate regulation</b></p> <p><b>Biodiversity</b></p>

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<b>Regulating soil erosion</b>	Soils  Permanent pasture  Woodland	<p>Steep slopes across the Chilterns make soils vulnerable to erosion under certain land uses. Some Chiltern soils types are also intrinsically vulnerable to erosion.</p> <p>The extensive woodland cover protects a large proportion of Chiltern soils.</p> <p>Soils under permanent vegetation – grassland and scrub – are less prone to wind or water erosion.</p>	Local	<p>Soil management is critical as many of the Chiltern soil types are vulnerable to damage and hence erosion. Erosion of thin chalk soils can lead to total loss of soil to expose bare rock. Soils under woodland will be conserved but are not accessible for food production.</p> <p>With the NCA falling into a Nitrate Vulnerable Zone overlying a regionally/nationally important aquifer, soil erosion is a concern in relation to water quality because water can transfer sediments and contaminants into groundwater and surface water.</p> <p>The predominant loamy and clayey soils with impeded drainage, covering almost half the NCA, are easily compacted by machinery or livestock if accessed when wet, increasing the risks of soil erosion by surface water run-off. The majority of these soils are also prone to capping/slaking, as are some of the freely draining lightly acid but base-rich soils (around 10 per cent of the NCA), leading to increased risk of erosion.</p> <p>The shallower lime-rich soils (around 15 per cent of the NCA) are at risk of erosion on sloping cultivated ground or where bare soil is exposed, as are the freely draining lightly acid loamy soils (covering about 20 per cent of the NCA), where there is also the potential for wind erosion on some coarse textured cultivated variants. The remaining loamy/clayey soils (flood plain or seasonally wet soil types covering less than 5 per cent of the NCA) are at low risk of erosion.</p>	<p>Encourage farmers and land managers to manage land on steep slopes as pasture, especially where there are thin chalk soils and where biodiversity benefits are significant.</p> <p>Incorporate organic matter, adopt reduced tillage and avoid compaction in order to minimise runoff and soil erosion.</p> <p>Incorporate features such as hedgerows and grassland buffers which can intercept runoff and so reduce widespread erosion, filter contaminants and enhance the landscape.</p> <p>Encourage longer growing periods between grazing and increase sward diversity in leys to increase root penetration and increased soil stability.</p>	<p><b>Regulating soil erosion</b></p> <p><b>Regulating soil quality</b></p> <p><b>Regulating water quality</b></p> <p><b>Food provision</b></p>

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<b>Pollination</b>	Species-rich grassland  Hedgerows  Woodland edge	Habitats supporting pollinating insects are provided by the Chilterns' hedgerows, species-rich grasslands, wetlands and exposed rock.	Local	In the Chilterns AONB, a 2008 survey found wheat growing on 50 per cent of cropped land; 20 per cent barley and 11 per cent oilseed rape <sup>37</sup> . Graminae species, such as maize and cereals, dominate Chilterns' crops and are wind pollinated so do not require pollinators. However, crops that are insect pollinated and are grown here now and may be in the future include soft and top fruit, linseed, oil seed rape, and a variety of beans.	Maintain pollinator habitat and, where possible, create new pollinator habitat.  Where crops are grown that require insect pollination, create new pollinator habitats including chalk grassland.	<b>Pollination</b>  <b>Food provision</b>  <b>Biodiversity</b>
<b>Pest regulation</b>	Habitat mosaic	The high degree of heterogeneity in the landscape, as opposed to a monoculture landscape, provides resilience against widespread pest and disease damage.	Local	There is recognised pest damage affecting timber production/trees in the Chilterns: mammals including grey squirrels, fat dormouse), muntjac and fallow deer, and insects, including oak processionary moth at Pangbourne and west London, and horse chestnut leaf miner. Sudden oak death, ash dieback and red band needle blight are also affecting trees in the Chilterns <sup>38</sup> .  Non-native species such as signal crayfish are also threatening native aquatic biodiversity. The mosaic of woodlands, hedgerows and watercourses may facilitate disease and pest dispersal. However, the mosaic of habitats will potentially support natural predators.	Maintain and build resilience against pests and diseases by supporting diversity within species populations and in terms of habitats and crop types. Focus upon managing impacts upon food and timber provision and biodiversity.  Establish pest and disease management strategies for the Chilterns woodlands and watercourses in particular.	<b>Pest regulation</b>  <b>Timber production</b>  <b>Biodiversity</b>

<sup>37</sup> Chilterns AONB Land Use Survey 2008, Chilterns Conservation Board (2008)

<sup>38</sup> Chilterns AONB State of the Environment Report, Chilterns Conservation Board (2010)



Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities	
A sense of place/ inspiration	Panoramic views	As a result of the special qualities of much of this landscape 52 per cent is designated AONB – the majority being the Chilterns AONB and a small area to the south of the Thames being the North Wessex Downs AONB.	National	Some modern development is reinforcing traditional building styles, particularly in the AONB. The AONB designation of the majority of this NCA reflects a strong scenic and landscape character and provides resources for conserving and enhancing the natural beauty of the area. Natural and cultural heritage is accessible and celebrated in local museums, parklands, urban spaces, countryside sites and on commons.	Work with the AONB to conserve and enhance the landscape and the special qualities of the AONB and consider applications of best practice beyond the AONB boundary.	Sense of place/ inspiration	
	Beechwoods						
	Historic environment						
	Watercourses						
	Escarpment	There is public access to locations and viewpoints with diverse and ancient natural and cultural heritage, including barrows and hill forts, and rare and unique features, such as the Chiltern gentian and Whiteleaf Cross, a carved chalk figure. Wide views and feelings of space and height are also gained from high points overlooking the clay vales or valley flood plains.			Local communities are active in engaging both local people and visitors in local heritage through town centre trails, museums, promoted countryside routes and events. Several farms host school visits to engage children in their local working countryside, but there are few near to London.	Further develop strong locality products where this supports the management of the landscape, for example woodland and sheep farming products and local building materials.	Food provision
	River Thames						
	Traditional built environment						
	Downland	A dense hedgerow network, holloways, woodland and branching steep valleys create an intimate landscape in places.				Further engage active communities in conserving and enhancing the landscape, and the distinctive physical and cultural character of the area.	Biodiversity
	Open access land and rights of way						
Farms hosting school visits	The Thames is a dominant feature in the south.	Engage farms near to London in hosting school visits.	Geodiversity				
	Continued on next page...						

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>A sense of place/ inspiration cont...</b>		<p>Consistent use of traditional building materials provides consistency and connection with local geology. Attractive villages and dispersed farmsteads give a sense of rural tranquillity and affluence while large urban centres and major roads are busy.</p> <p>Designed landscapes provide a sense of grandeur.</p> <p>Local museums celebrate local, personalities, artistic endeavour and heritage, for example the Roald Dahl Museum and Henley River and Rowing Museum.</p> <p>Nineteen farms in the NCA host school visits under agri-environment schemes<sup>39</sup>.</p>		<p>There is an absence of strong local brands associated with food, wood or other products, suggesting that the identity of the working landscape is not as strong as it could be. In the past, orchard produce was associated strongly with this area; a characteristic now widely lost. The Chilterns AONB considers that the conservation of the built environment is largely dependent upon outside sources for materials and skills<sup>40</sup>.</p> <p>The area continues to provide stimulation for many writers, artists, poets and painters.</p>		

<sup>39</sup> Based on analysis of agri-environment scheme data held by Natural England, 2012

<sup>40</sup> Chilterns Area of Outstanding Natural Beauty: Management Plan 2008 - 2013 – A Framework for Action, Chilterns Conservation Board (undated)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Sense of history</b>	<p>Scheduled Monuments and other, unscheduled heritage assets</p> <p>Registered Parks and Gardens</p> <p>Listed buildings</p> <p>Traditional built environment, both urban and rural</p> <p>Ancient natural features</p> <p>Ancient woodlands and their traditional management and production</p>	<p>There are 202 Scheduled Monuments, including parts of the well known prehistoric routeway called the Ridgeway.</p> <p>Around 15 of these monuments are declining in condition and on the At Risk Register. Additional monuments are at risk and of an unknown or stable condition.</p> <p>Bronze-age barrows and iron-age hill forts and dykes found along the scarp connected by the Icknield Way which has been in use since the Neolithic period</p> <p>Iron-age hillforts and dykes found along the Thames Valley to the south.</p> <p>Roman influence is still evident through the communications network and settlement pattern, and medieval influence is reflected in settlement and field patterns.</p> <p>Chalk streams reveal unique features associated with watercress growing and numerous mill sites.</p>	Regional	<p>The history of the landscape is evident in numerous historic features from various ages dating back to prehistory. Some historic features are widespread, including ancient boundaries, holloways, commons, ancient woodlands, churches, and buildings in the vernacular style.</p> <p>Public access is provided to some key heritage assets and landscapes including parklands, monuments along the Ridgeway and commons, increasing the opportunity to understand and interpret the historic environment.</p> <p>Woodland archaeology reveals changes in woodland management and climate including coppice stools linked to medieval activities and saw pits and other features associated with the furniture industry of the 18th and 19th centuries.</p> <p><b>Continued on next page...</b></p>	<p>Engage communities and owners of historic features in celebrating and conserving the historic environment, including developing skills and industry around historic environment conservation and traditional building materials and construction.</p> <p>Improve public access and visitor facilities to key historic features.</p> <p>Enhance the setting of historic features as part of landscape-scale projects which integrate multiple landscape objectives.</p> <p>Establish positive management of woodlands which conserves their archaeology and draws on traditional techniques while also benefitting biodiversity, wood fuel production and carbon storage.</p>	<p><b>Sense of history</b></p> <p><b>Sense of place/inspiration</b></p> <p><b>Timber provision</b></p> <p><b>Biodiversity</b></p> <p><b>Geodiversity</b></p> <p><b>Recreation</b></p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Sense of history cont...</b>		<p>More recent heritage assets include the Grand Union Canal.</p> <p>There are 6,851 Listed Buildings. Traditional materials in the built environment include flint, brick, tiles and in places weatherboard and thatch, plus old farm buildings characterised by large timber-framed barns clad with black weatherboard. The use of Totternhoe Stone (clunch) as a building material is a characteristic of this area.</p> <p>Forty registered historic parks and gardens in the NCA, many the works of key 18th century designers such as Bridgeman, Repton and Brown</p> <p>Ancient woodlands are extensive and contain a variety of archaeology, veteran trees and ancient coppice stools.</p>		<p>Some settings of historic features could be improved, as could their management, for example through the reduction in arable cultivation currently affecting monuments. There is also concern about visitor pressure negatively impacting historic features, including historic routeways and popular landmarks.</p> <p>The value of such an ancient landscape is heightened by the fact that it lies adjacent to modern development including the London edge and several motorways. Local museums, historic character mapping projects and historic sites celebrate and engage people in the historic environment. There are local community groups working to conserve and engage people in the historic environment.</p> <p>The collected expression of taste and wealth seen in the many grand houses and parks and gardens, reflects the proximity of the area to London and the past and ongoing popularity of this highly scenic landscape.</p>		

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<b>Tranquillity</b>	Secluded valleys  Scarp  Woodlands	<p>The largest area of high to medium tranquillity is in the south-west, including around Henley-on-Thames.</p> <p>Elsewhere, parts of the escarpment and a few valleys without major roads and settlements are highly tranquil and there are also very small pockets of medium to high tranquillity near to the London edge, for example between Amersham and Hemel Hempstead.</p> <p>Only 20 per cent of the NCA is assessed as 'undisturbed'.</p>	Regional	<p>The Chilterns is a transitional area in which levels and areas of tranquillity increase with distance away from London, except in the north where Luton and Stevenage influence tranquillity.</p> <p>Low tranquillity scores are dispersed across the NCA reflecting settlements and major transport corridors.</p> <p>Experiences of tranquillity in those pockets of high to medium tranquillity near to the London edge and in the Thames Valley will be particularly significant and valued.</p> <p>Luton and Stevenage are a focus for further development and so the surrounding areas of high to medium tranquil spaces may be detrimentally affected.</p> <p>Traffic, a key contributor to disturbance, affects popular countryside visitor destinations as well as more traditional rural settlements. Traffic calming measures and support for non-car transport has reduced traffic issues at Ashridge.</p>	<p>Distinctive elements of the Chilterns landscape, woodlands, flowing water and the 'rural' scene, should be conserved and managed to improve perceptions of tranquillity, particularly near to settlements.</p> <p>Traffic calming measures and support for non-car travel at popular countryside destinations should be encouraged and supported and will improve tranquillity and recreation experiences generally.</p> <p>Further erosion of tranquillity should be avoided or minimised by ensuring development in areas of high to medium tranquillity is appropriate to the setting and incorporates measures, such as tree planting and green 'buffers'.</p>	<p><b>Sense of tranquillity</b></p> <p><b>Sense of place/ inspiration</b></p> <p><b>Sense of history</b></p> <p><b>Recreation</b></p>



Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Recreation</b>	<p>Ridgeway National Trail</p> <p>Thames Path National Trail</p> <p>Open access land</p> <p>Public rights of way</p> <p>National cycle routes and regional trails</p> <p>Grand Union Canal</p> <p>Public forest estate</p> <p>Historic parks and gardens</p> <p>River Thames</p> <p>The scarp slope</p>	<p>More publicly accessible routes and green spaces are needed for the populations of Luton, Hemel Hempstead and High Wycombe but other settlements have good access provision per head of population<sup>41</sup>.</p> <p>There are 3,563 km (equivalent to 2.17 km per km<sup>2</sup>) of rights of way, and over 3,500 ha of open access land (around 2.5 per cent of the NCA), including significant tracts of common land.</p> <p>There are three National Nature Reserves. 1,560 ha of woodland in the public forest estate is managed outside woodland grant schemes for timber and other ecosystem services.</p>	Regional	<p>In 2007, it was estimated that there were just over 55 million leisure visits made to the Chilterns AONB<sup>42</sup>. A survey at 11 sites in the AONB established that 74 per cent of visits were made by local residents and 83 per cent were made by groups; family and/or friends<sup>43</sup>.</p> <p>The Chilterns represents an important local recreational resource for approximately 1.38 million residents in the 11 district council areas in which the AONB falls<sup>43</sup>. In addition, the area is easily accessible from London and other major urban centres, such as Milton Keynes, and offers relative tranquillity<sup>44</sup>.</p> <p>Some locations are recognised 'honey pot' sites, for example, Wendover Woods and Ashridge Estate<sup>45</sup> and the resilience of these sites' features to visitor pressure is a concern. Traffic on rural routes also affects enjoyment.</p> <p><b>Continued on next page...</b></p>	<p>Improve the bridleway network as a multi-user network and also to meet the demands of the considerable resident population of horse owners.</p> <p>Manage visitor pressure upon fragile locations by promoting alternative, more robust and equally attractive destinations and increase the resilience of vulnerable sites.</p> <p>Maximise the contribution that volunteers and local communities can make to the maintenance of landscape features which are recreational assets.</p> <p>Support, create and improve links between recreational assets and settlements.</p> <p>Address gaps in the provision of routes and green spaces, targeting efforts around Luton, Hemel Hempstead and High Wycombe.</p>	<p><b>Recreation</b></p> <p><b>Biodiversity</b></p> <p><b>Sense of place/ inspiration</b></p> <p><b>Sense of history</b></p>

<sup>41</sup> Based on visual analysis of countryside access data held by Natural England, 2012 <sup>42</sup> Chilterns AONB Visitor Survey 2007, Tourism South East (2008) <sup>43</sup> Ibid <sup>44</sup> Chilterns Area of Outstanding Natural Beauty: Management Plan 2008 - 2013 – A Framework for Action, Chilterns Conservation Board (undated) <sup>45</sup> Chilterns AONB Visitor Survey 2007, Tourism South East (2008)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Recreation cont...</b>		<p>Two National Trails run through the area; the Ridgeway follows the crest of the scarp and the Thames Path follows the course of the river. There are a number of National Cycle Network routes and regional routes, the Icknield Way and the Chiltern Way. The Ridgeway, Grand Union Canal and National Cycle routes are multi-user routes along much of their length.</p> <p>Water-based activities are provided along the Thames and Grand Union Canal.</p> <p>There are a wide range of activities offered by this area, for example walking, cycling, horse riding, gliding, canoeing, mountain biking, canal boating and bird watching<sup>46</sup>. A large number of organisations provide events for the public<sup>47</sup>. The Chiltern Society volunteer groups assist in the maintenance of the rights of way network.</p>		<p>A survey of 11 sites in the Chilterns AONB also suggested the majority of visits involve passive activities, such as walking or enjoying the view, rather than active pursuits such as off-roading or paragliding<sup>47</sup>.</p> <p>There is demand for more multi-user routes, particularly along the Thames Path.</p> <p>Common land, lying in close proximity to homes, workplaces and schools, is particularly well used. Large areas are open to the public by the National Trust, Forestry Commission, wildlife trusts and local authorities, with a particular assemblage along the ridge providing some of the best views in the area<sup>46</sup>.</p> <p>The percentage of open access land and accessible natural green space<sup>48</sup> in the AONB is relatively high and well spread. Locally promoted routes equally serve different users, including 'easy access' circular trails.</p> <p><b>Continued on next page...</b></p>		

<sup>46</sup> Chilterns Area of Outstanding Natural Beauty: Management Plan 2008 - 2013 – A Framework for Action, Chilterns Conservation Board (undated) <sup>47</sup> Ibid <sup>48</sup> Accessible natural green spaces are areas of countryside that provide both public access and a potential wildlife habitat – woodlands, grasslands, wetlands, rivers, canals and country parks.

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Recreation cont...</b>		Visitor experiences at some sites may be negatively impacted by congestion and noise.		<p>Approximately three-quarters of accessible natural green space is woodland, with around a third of open access woodlands being provided by the Forestry Commission. Key landscape features are accessible and offer a broad appeal, including picturesque villages, waterways, biodiverse habitats and historic places<sup>49</sup>.</p> <p>Boat traffic has reduced along the Thames in recent years<sup>50</sup>.</p>		

<sup>49</sup> Chilterns Area of Outstanding Natural Beauty: Management Plan 2008 - 2013 – A Framework for Action, Chilterns Conservation Board (undated) <sup>50</sup> Ibid

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Biodiversity</b>	<p>Species- rich chalk grassland</p> <p>Ancient woodland</p> <p>Ancient hedgerows</p> <p>Sustainably managed farmland</p> <p>Chalk streams</p> <p>Common land habitats</p> <p>Parkland</p> <p>Farmland birds</p> <p>Arable weeds</p> <p>Local Nature Reserves</p>	<p>Recognised at an international level, the beechwood SACs cover just less than 1 per cent of the NCA.</p> <p>There are 3,670 ha of land designated SSSI, dominated by chalk grassland and broadleaved woodland. 98 per cent of SSSI are in 'favourable' or 'unfavourable recovering' condition.</p> <p>There are 1,062 Local Wildlife Sites. The provision of Local Nature Reserves does not meet the recommended 1 ha per 1000 population in any district.</p> <p>Biodiversity of parklands, chalk streams and orchards is under-represented amongst all designated sites.</p> <p>Semi-natural habitats are restricted in extent, except woodland. Chalk grassland and common land habitats exist as scattered fragments, although the extensive hedgerow network provides potential linkages.</p>	National	<p>Important areas and types of semi-natural habitat are designated, although stretches of chalk stream, ancient hedgerow, parkland and farmland biodiversity are under-represented.</p> <p>Larger areas of woodland, common and grassland represent core areas of habitat. Chalk streams and ancient hedgerows can function as corridors.</p> <p>Declining livestock numbers have made conservation of open habitats difficult, giving rise to significant losses to scrub and woodland. Open habitats are largely conserved only where agri-environment schemes support management.</p> <p>Conservation of woodland biodiversity relies upon grant schemes, although a growing wood fuel market is reviving management in some woods. Many woods have long been unmanaged, leading to declines in woodland birds and butterflies. Orchards are largely unmanaged.</p> <p><b>Continued on next page...</b></p>	<p>Establish a resilient ecological network. Identify and address gaps and build core areas, particularly in relation to chalk grassland and flood plain habitats. Incorporate access improvements to provide for public engagement with nature</p> <p>Realise greater recognition of the biodiversity interest of parkland, chalk streams and orchards by seeking designations as appropriate and by integrating biodiversity conservation into management of associated historic assets.</p> <p>Conserve important species populations in semi natural and farmland settings through supporting sustainable farming. Where possible, management to conserve biodiversity should also seek to assist water and soil conservation, focusing upon areas where risks are highest and the value of the asset greatest, for example, chalk grassland on steep slopes or wet meadows alongside a chalk stream.</p>	<p><b>Biodiversity</b></p> <p><b>Recreation</b></p> <p><b>Sense of place</b></p> <p><b>Sense of history</b></p> <p><b>Regulating soil quality</b></p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Biodiversity cont...</b>		<p>Chalk streams support characteristic species and also strengthening populations of water vole. However, the ecological status of the rivers Gade and Ver is considered 'bad' and less than five waterbodies are considered 'good'.</p> <p>Arable weeds are localised but there are strong populations of shepherd's needle, for example. Farmland birds include corn bunting, grey partridge and yellowhammer.</p> <p>The red kite draws visitors to the Chilterns, as do rare plants such as the pasque flower at Barton Hills NNR.</p>		<p>Farmland birds benefit from the mosaic of habitats and from sustainable farming practices supported by agri-environment schemes.</p> <p>Chalk stream ecology is negatively affected by low flows, engineered channels and pollution. Low flow alleviation schemes, resource protection measures across farmland and improvements delivered by community groups are improving condition in some places.</p> <p>Chalk streams within the Chilterns AONB have benefitted from a dedicated long-running Chalk Streams Project which promotes best practice conservation and development and supports conservation activities. Project work has secured improvements to stream and flood plain habitats along several rivers including restoration of water meadows and improved fish passage along the Chess<sup>51</sup>.</p>	<p>Engage local communities and landowners in conserving their local biodiverse spaces as part of a wider, co-ordinated ecological network, particularly those near settlements and popular with visitors such as Barton Hills NNR.</p> <p>Restore chalk streams, flood plain habitats and flood plain function. Innovative solutions will be required along significant stretches of watercourse due to the constraints of existing development and settlement.</p> <p>Review the Local Nature Reserve resource and identify and address any gaps, particularly where new development is taking place.</p> <p>Secure biodiverse green infrastructure as part of development.</p> <p>Manage visitor pressure upon fragile locations by promoting alternative, more robust and attractive destinations and increasing the resilience of vulnerable sites.</p>	

<sup>51</sup> Annual Report 2011-12, Chilterns Chalk Streams Project (undated)



Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity cont...				<p>Commons and riversides are significant as biodiverse spaces near to settlements. Access to urban-edge grasslands and woodlands may also be significant for local people to experience 'common' or 'urban' wildlife.</p> <p>Local Nature Reserves are relatively few considering the population size. With many key areas of habitat, including downland, being subject to public access, there can be issues around visitor pressure and conflict between visitors and management activities.</p> <p>Local authorities, private farms, the National Trust, Wildlife Trusts and Forestry Commission provide public access to biodiverse sites. Promoted routes and interpretation boards in the countryside celebrate the natural interest of the Chilterns.</p> <p>Landowners deliver nature conservation management under agri-environment schemes while numerous community groups and organisations also carry out nature conservation work.</p>		

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Geodiversity</b>	Chalk  River terrace gravels  Fluvial geomorphology	<p>There are 14 geological SSSI and 33 Local Geological Sites. The form of the Chilterns Chalk outcrop is prominent and a distinctive landform that is visible and accessible for interpretation.</p> <p>Some periglacial landforms, such as dry valleys, chalk carved figures and disused quarries, some of which are designated, are accessible by the public, for example. Whiteleaf Cross, College Lake, Totternhoe Quarry.</p> <p>Landforms of the Thames Valley, including the Goring Gap and gravel pits, can be accessed and enjoyed by the public from the Thames Path and from locally popular vantage points such as Winter Hill, near Cookham.</p> <p><b>Continued on next page...</b></p>	Local	<p>The geology and processes that underpin the area have generated much of the areas agriculture, land use and now cultural heritage. Despite being almost entirely underlain by the Chalk, a diversity of soils have developed through the interplay of climate, topography, vegetation and human influence, which in turn support the characteristic habitats and land uses across the Chilterns.</p> <p>Of the few green spaces with very good visitor facilities such as car parks and visitor centres, many have geodiversity interest that can be promoted to the public.</p> <p>Historic buildings built with local materials and historic excavation sites on commons also represent an important resource near to settlement. Public access to exposures of chalk is rare and new excavations are not taking place.</p>	<p>Work with existing and new groups, including landowners of green spaces, to build capacity to carry out geoconservation activities and education.</p> <p>Secure benefits to geodiversity through landscape scale projects which integrate multiple landscape objectives.</p> <p>Engage communities and property owners in celebrating and continuing use of local building materials, including developing skills and industry around traditional building materials.</p> <p>The relationship between geodiversity in this area and the underlying aquifer, water quality and availability, and soils presents an opportunity to engage a wide audience in better understanding natural processes that limit available resources.</p>	<p><b>Geodiversity</b></p> <p><b>Sense of place/ inspiration</b></p> <p><b>Sense of history</b></p> <p><b>Recreation</b></p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity cont...		<p>Traditional building materials also celebrate local geology. Local museums and promoted routes contribute to the interpretation of local geodiversity. There are local community groups carrying out geoconservation and public engagement activities.</p> <p>Pitstone Quarry SSSI is famous for an organic deposit (around 180,000 years BP) which is evidence of a previously unknown British interglacial.</p>		Those groups which are seeking to engage the public and study geodiversity have restricted resources, relying largely on volunteers, consequently public engagement in geodiversity is small-scale.		

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# Appendix B

## Extracts from the South Oxfordshire District Landscape Character Assessment



	The Clay Vale (LCA 3) including: Flat Semi-enclosed Farmland LCT Undulating Open Vale LCT and Undulating semi-enclosed vale LCT.	The Eastern Fringes (LCA 5) including: Open Rolling Downs LCT Semi-enclosed Rolling Downs LCT and Parkland and Estate Farmlands LCT.	The Chilterns Escarpment (LCA 8)
<b>Key landscape attributes</b>	<ul style="list-style-type: none"> <li>The Clay Vale embraces the low-lying, gentle landscape which overlies the Gault Clay across the centre of the South Oxfordshire district.</li> <li>This gives rise to low ground, subdued topography and heavy soils which are typical of the gently rolling vale landscape.</li> <li>The landscape ranges between c. 50m AOD and c. 110m AOD. The highest area of land ...at Chinnor (116m AOD).</li> <li>The area is crossed by a network of small watercourses.</li> <li>The Clay Vale contains areas of Flood Zone 2 and 3, associated with the River Thame and smaller watercourses.</li> <li>Priority habitats are widespread in this area, including semi-improved grassland, ... wood-pasture and parkland, deciduous woodland, traditional orchards.</li> </ul>	<ul style="list-style-type: none"> <li>The easterly part of the 'shelf' of Lower Chalk and Upper Greensand which forms a belt of higher rolling ground between the low-lying vale and the steep Chilterns escarpment.</li> <li>Permeable, calcareous rocks produce the smoothly rolling landform and light, loamy soils that are characteristic of chalk areas and which contrast with the low-lying, subtle relief and heavy soils of the clay vale.</li> <li>The topography ... ranges between c. 80m AOD and c. 190m AOD.</li> <li>Some areas of Flood Zone 2 and 3.</li> <li>Linear belts, clumps and blocks of woodland are quite frequent features, providing some structure and enclosure in the landscape.</li> <li>Ancient woodland exists in small areas.</li> <li>A network of small watercourses cross through the landscape.</li> </ul>	<ul style="list-style-type: none"> <li>The Chilterns Escarpment comprises the steep face and top of the escarpment, which forms a dramatic backdrop to the low-lying landscape of the vale to the north-west.</li> <li>The chalk geology is exposed along the steep scarp face giving rise to thin, calcareous soils which are often unsuited to cultivation.</li> <li>Located entirely within the Chilterns AONB.</li> <li>Topography ranges between c. 50m AOD and c. 250m AOD.</li> <li>Limited numbers of watercourses.</li> <li>Much of this landscape is blanketed in broad-leaved semi-natural woodland, including areas of ancient woodland.</li> <li>Typically forms a distinctive mosaic of dense shady woodland interspersed, especially on the steeper slopes, with small pockets or larger stretches of open chalk grassland.</li> </ul>

	The Clay Vale (LCA 3) including: Flat Semi-enclosed Farmland LCT Undulating Open Vale LCT and Undulating semi-enclosed vale LCT.	The Eastern Fringes (LCA 5) including: Open Rolling Downs LCT Semi-enclosed Rolling Downs LCT and Parkland and Estate Farmlands LCT.	The Chilterns Escarpment (LCA 8)
	<ul style="list-style-type: none"> <li>• Ancient woodland exists in small areas.</li> <li>• The land use is predominantly agricultural, comprising mostly of arable land...with some tracts of pasture.</li> <li>• Species-rich hedgerows are distributed throughout parts of this character area.</li> <li>• Open, denuded and exposed character, with high intervisibility in the Undulating Open Vale LCT with moderate intervisibility in the Undulating semi-enclosed vale LCT.</li> <li>• Stronger structure of hedgerows and trees providing a clearer definition of field pattern in the Undulating Semi-Enclosed LCT.</li> <li>• Distinctive elevated and expansive character on higher ground, with dominant sky and long views.</li> <li>• Settlement pattern within the vale is strongly influenced by physical factors. The heavy clay soils and a risk</li> </ul>	<ul style="list-style-type: none"> <li>• The land use is predominantly agricultural, comprising mostly of arable land.</li> <li>• Species-rich hedgerows are distributed throughout parts of this character area.</li> <li>• Priority habitats in this area include wood-pasture and parkland, traditional orchards and deciduous woodland</li> <li>• The Ridgeway crosses through the area.</li> <li>• This area has provided a favoured area for settlement since prehistoric times. The Icknield Way, a prehistoric thoroughfare, followed the outcrop of dry, permeable rocks between the wet land of the vale and the steep Chilterns escarpment, and the numerous pure springs that emerge along the scarp foot have attracted a long string of villages.</li> <li>• The Saxon period accounts for some other patterning in the landscape, with</li> </ul>	<ul style="list-style-type: none"> <li>• This character area contains a variety of sites designated for their biodiversity, this includes Aston Rowant SAC, SSSI and NNR (flower-rich chalk grassland, beech woodland and juniper scrub) and Chilterns Beechwoods SAC (beech forests, semi-natural dry grasslands and scrubland facies on calcareous substrates)</li> <li>• Where it exists, calcareous grassland is a distinctive landscape component. The habitat makes an important contribution to biodiversity hosting several plants and animals that are not found in other habitat types, which is why locations like Aston Rowant have been designated as a Special Area of Conservation.</li> <li>• Pleasant scents of herbs such as marjoram and thyme clearly discernible.</li> <li>• Priority habitats in Chilterns Escarpment include deciduous</li> </ul>

	The Clay Vale (LCA 3) including: Flat Semi-enclosed Farmland LCT Undulating Open Vale LCT and Undulating semi-enclosed vale LCT.	The Eastern Fringes (LCA 5) including: Open Rolling Downs LCT Semi-enclosed Rolling Downs LCT and Parkland and Estate Farmlands LCT.	The Chilterns Escarpment (LCA 8)
	<p>of flooding have traditionally discouraged settlement on areas underlain by the Gault Clay and there are still quite large areas of the vale which are sparsely settled.</p> <ul style="list-style-type: none"> <li>• Brick was ... widely used from an early date and appears as 'nogging' for timber framed houses, in alternating bands of brick and flint in some eighteenth century cottages and in a characteristic pattern of mellow red and grey brickwork.</li> <li>• The landscape is of a strong, agricultural nature, particularly comprising of arable land.</li> <li>• Sparsely settled villages, stone walls and churches with corallian limestone characterise built form across much of the landscape.</li> <li>• Predominantly rural character but some localised intrusion of main roads (including M40/A40), overhead power lines and built development.</li> </ul>	<p>the boundaries of 'strip parishes' (long, linear land holdings which run up into the Chiltern Hills) following the line of early routeways. The slopes below the Chilterns are patterned by the intersection of transverse and parallel routes, visible in the existing lattice work of footpaths and bridleways.</p> <ul style="list-style-type: none"> <li>• Many villages were originally nucleated in form, with buildings typically clustered around a church and central open space.</li> <li>• Earlier buildings were timber-framed with wattle and daub infill, replaced later by brick nogging. Brick and flint are widespread with some examples of the local soft 'clunch' or chalk stone used in association with brick dressings. Roofs are typically red tiles with occasional thatch.</li> <li>• Busy transport corridors cross through the area including the M40 motorway.</li> </ul>	<p>woodland, traditional orchards, wood-pasture and parkland, semi-improved grassland and lowland calcareous grassland.</p> <ul style="list-style-type: none"> <li>• Agricultural land comprises a mixture of pasture and arable.</li> <li>• Narrow lanes and tall hedgerows</li> <li>• This landscape is sparsely settled with small villages and hamlets.</li> <li>• The steep scarp face itself is virtually devoid of buildings with only a few isolated farms nestling in hollows along the lower slopes and within the coombes and minor valleys.</li> <li>• Traditional building materials are typical of the Chilterns as a whole, with a predominance of red and silver-grey brick and flint. Plain tiles were the rule on the larger roofs, with thatch on cottages with some slate introduced in Victorian times.</li> <li>• The scarp has a distinctive pattern of roads, with distinctive 'sunken lanes' climbing the scarp face</li> </ul>

	The Clay Vale (LCA 3) including: Flat Semi-enclosed Farmland LCT Undulating Open Vale LCT and Undulating semi-enclosed vale LCT.	The Eastern Fringes (LCA 5) including: Open Rolling Downs LCT Semi-enclosed Rolling Downs LCT and Parkland and Estate Farmlands LCT.	The Chilterns Escarpment (LCA 8)
	<ul style="list-style-type: none"> <li>Long distance views to the Chilterns AONB in the east.</li> <li>Aeroplanes are a common feature in the skies above the area.</li> <li>Villages in the area are typically nucleated.</li> </ul>	<ul style="list-style-type: none"> <li>Roads and public rights of way on the lower slopes of the Chilterns escarpment offer long distance views to the west.</li> <li>The escarpment of the Chiltern Hills is a prominent feature strongly defining the landscape to the east of the area.</li> </ul>	<ul style="list-style-type: none"> <li>The height of the escarpment offers long distance views to the west and north. The M40 motorway at the Stokenchurch Gap is a visual and aural detractor.</li> </ul>
<b>Forces for Change and Guidelines for Mitigation</b>	<b>Agricultural intensification, diversification and farm amalgamation:</b> <ul style="list-style-type: none"> <li>Strengthen the hedgerow network with hedgerow trees such as oak and ash. Promote environmentally-sensitive maintenance of hedgerows, including coppicing and layering.</li> <li>Protect stone walls from deterioration.</li> <li>Prevent scrub encroachment in areas of species-rich grassland.</li> <li>Species-rich rivers and ditches should be maintained with diverse banksides and aquatic vegetation through sympathetic management...</li> </ul>	<b>Agricultural intensification, diversification and farm amalgamation:</b> <ul style="list-style-type: none"> <li>Strengthen the field pattern by replanting thinned hedges using locally characteristic species such as hawthorn, and hedgerow trees such as crack willow, oak and ash.</li> <li>Promote environmentally-sensitive maintenance of hedgerows, including coppicing and layering</li> <li>Replant where necessary with shrub species such as blackthorn, field maple, dogwood and spindle (see also the South Oxfordshire Design Guide ,</li> </ul>	<b>Agricultural intensification, diversification and farm amalgamation:</b> <ul style="list-style-type: none"> <li>Safeguard, maintain and enhance the quality of unimproved chalk and limestone grassland</li> <li>Strengthen the field pattern of hedgerows and hedgerow trees where it is weak,</li> <li>Promote, where possible, the conservation of the surviving areas of permanent pasture and promote arable reversion to grassland particularly on land adjacent to watercourses</li> <li>Protect stone walls from deterioration.</li> </ul>

	The Clay Vale (LCA 3) including: Flat Semi-enclosed Farmland LCT Undulating Open Vale LCT and Undulating semi-enclosed vale LCT.	The Eastern Fringes (LCA 5) including: Open Rolling Downs LCT Semi-enclosed Rolling Downs LCT and Parkland and Estate Farmlands LCT.	The Chilterns Escarpment (LCA 8)
	<p><b>Inappropriate or inconsistent management, or neglect of existing parklands:</b></p> <ul style="list-style-type: none"> <li>Safeguard, maintain and enhance and the characteristic landscape features of existing parklands that include mature trees, avenues of trees, lakes, woods and walls.</li> </ul> <p><b>Development, expansion and infilling of settlements:</b></p> <ul style="list-style-type: none"> <li>Minimise the visual impact of intrusive land uses at the fringes of towns, villages and farms with the judicious planting of tree and shrub species characteristic of the area.</li> <li>Maintain the nucleated pattern of settlements, and promote the use of building materials to maintain vernacular style and a scale of development and that are appropriate to the Clay Vale (see also the South Oxfordshire Design Guide , November 2016).</li> <li>Protect the sparsely settled character of the landscape and the integrity and</li> </ul>	<p>November 2016; and the Chilterns AONB Building Design Guide 2010).</p> <ul style="list-style-type: none"> <li>Felling of mature tree specimens should be resisted.</li> </ul> <p><b>Inappropriate or inconsistent management, or neglect of existing parklands:</b></p> <ul style="list-style-type: none"> <li>Safeguard, maintain and enhance and the characteristic landscape features of existing parklands that include mature trees, avenues of trees, lakes, woods and walls.</li> <li>Promote the conservation and restoration of the pastoral character of existing parklands and promote the replacement of veteran and mature trees where appropriate.</li> </ul> <p><b>Development, expansion and infilling of settlements:</b></p> <ul style="list-style-type: none"> <li>Maintain the nucleated pattern of settlements, and promote the use of building materials to maintain vernacular style and a scale of development and that are appropriate to Eastern Vale Fringes.</li> </ul>	<ul style="list-style-type: none"> <li>Promote the re-establishment of acid grassland and heath on the Chilterns Commons</li> </ul> <p><b>Inappropriate or inconsistent management, or neglect of existing parklands:</b></p> <ul style="list-style-type: none"> <li>Safeguard, maintain and enhance the characteristic landscape features of existing parklands including veteran trees, avenues of trees, lakes, woods and walls.</li> <li></li> </ul> <p><b>Inappropriate built form, development expansion and infilling of settlements:</b></p> <ul style="list-style-type: none"> <li>Minimise the visual impact of intrusive land uses at the fringes of towns and villages with the judicious planting of tree and shrub species characteristic of the area. This will help to screen any development and integrate it more successfully with its surrounding countryside.</li> </ul> <p><b>Inappropriate or inconsistent management, or neglect of, existing woodlands:</b></p>



	The Clay Vale (LCA 3) including: Flat Semi-enclosed Farmland LCT Undulating Open Vale LCT and Undulating semi-enclosed vale LCT.	The Eastern Fringes (LCA 5) including: Open Rolling Downs LCT Semi-enclosed Rolling Downs LCT and Parkland and Estate Farmlands LCT.	The Chilterns Escarpment (LCA 8)
	<p>vernacular character of the estate villages.</p> <p><b>Decline in management of existing woodlands and trees:</b></p> <ul style="list-style-type: none"> <li>Enhance and strengthen the character of tree-lined watercourses by planting willows and ash and, where appropriate, pollarding willows.</li> <li>Establish buffer strips/field margins to potentially benefit small mammals, invertebrates and birds adjacent to willow pollards.</li> <li>Promote small-scale planting of deciduous woodland blocks using locally characteristic species such as crack willow, oak, ash and alders.</li> <li>Ancient semi-natural woodlands should be managed to ensure they are in favourable condition.</li> <li>Promote the sustainable management of existing woodland to safeguard its long-term survival.</li> </ul>	<ul style="list-style-type: none"> <li>Minimise the visual impact of intrusive land uses at the fringes of towns, villages and farms with the judicious planting of tree and shrub species characteristic of the area.</li> <li>Protect the sparsely settled character of the landscape and the integrity and vernacular character of the estate villages.</li> </ul> <p><b>Decline in management of existing woodlands and trees:</b></p> <ul style="list-style-type: none"> <li>Enhance and strengthen the character of tree-lined watercourses by planting willows and ash and, where appropriate, pollarding willows.</li> <li>Establish buffer strips/field margins to potentially benefit small mammals, invertebrates and birds adjacent to willow pollards.</li> <li>Species-rich rivers and ditches are also very important and the aim should be to establish and maintain diverse banksides and aquatic vegetation through sympathetic management</li> </ul>	<ul style="list-style-type: none"> <li>Promote the sustainable management of existing woodland to safeguard its long-term survival.</li> <li>There is a significant amount of ancient semi-natural woodland within the Chilterns and the priority must be to ensure that all sites are in favourable condition and management.</li> </ul>

	The Clay Vale (LCA 3) including: Flat Semi-enclosed Farmland LCT Undulating Open Vale LCT and Undulating semi-enclosed vale LCT.	The Eastern Fringes (LCA 5) including: Open Rolling Downs LCT Semi-enclosed Rolling Downs LCT and Parkland and Estate Farmlands LCT.	The Chilterns Escarpment (LCA 8)
		<p>and the use of agri-environment schemes.</p> <ul style="list-style-type: none"> <li>• Promote small-scale planting of deciduous woodland blocks using locally characteristic species such as alders, ash oak and willows.</li> <li>• Ancient semi-natural woodlands should be managed to ensure they are in favorable condition.</li> </ul>	

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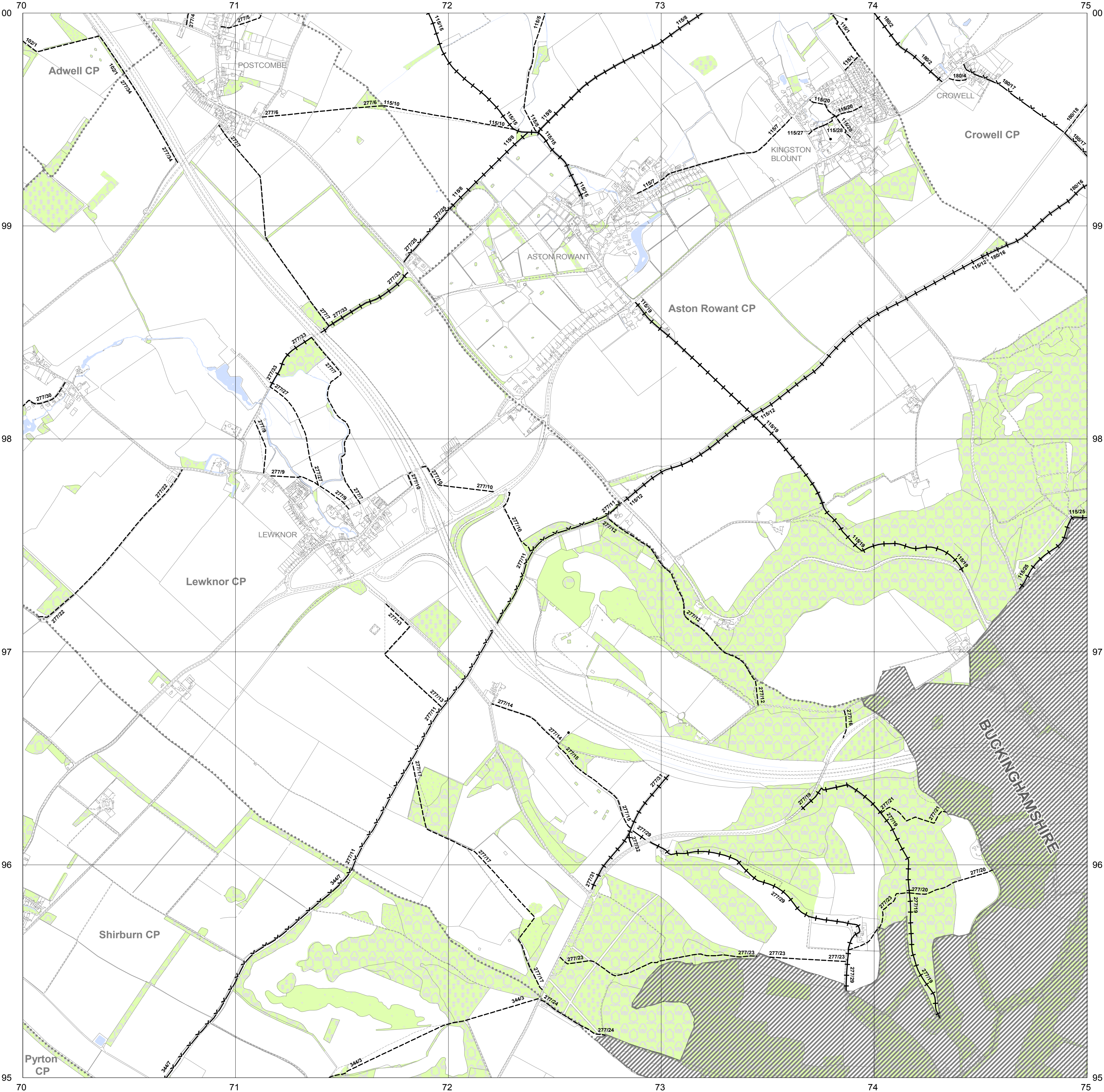
# Appendix C

**Extract from the Oxfordshire Definitive Map (accessed on 03/12/18)**



Definitive Map of Public Rights of Way for Oxfordshire  
Relevant Date: 21<sup>st</sup> February 2006

SHEET SU 79 NW



SHEET SU 79 NW  
Scale 1:10,000

To be read in conjunction with the Definitive Statement.  
The Definitive Map and Statement is conclusive evidence in law that the rights shown on the Map existed at the relevant date, but this is without prejudice to the possible existence of other rights not shown on the Map (see s56 Wildlife & Countryside Act 1981).

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Based on Ordnance Survey map data 2003.

**KEY:**

- Public Footpath
- Public Bridleway
- Road Used as Public Path  
(To be redesignated under Countryside & Rights of Way Act 2000, section 47, to Restricted Byway.)
- Byway Open to all Traffic

- County Boundary
- District Boundary
- Parish Boundary
- (where shown) Right of Way either:  
crosses administrative boundary,  
reaches terminus or  
changes status.

SP 60 SE	SP 70 SW	SP 70 SE
SU 69 NE	SU 79 NW	SU 79 NE
SU 69 SE	SU 79 SW	

For further information please contact:

Oxfordshire County Council  
Environment and Economy  
Rights of Way Office  
Countryside Service



Telephone: 01865 810808

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# Appendix D

## Ordnance Survey historic map



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# Appendix E

## Land parcel assessment table of landscape capacity

## LC-459 Aston Rowant and Kingston Blount Landscape Capacity and Sensitivity

Methodology table	Table 2.2	Table 2.4	Table 2.5	Table 2.6	Table 2.7	Table 2.8	Table 2.9
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Parcel number	Landscape character sensitivity	Visual sensitivity	Landscape sensitivity	Wider landscape sensitivity	Overall landscape sensitivity	Landscape value	Landscape capacity	Notes
1	M/H	M/H	M/H	M/H	M/H	M	M/L	Field boundaries and woodland to south shown on 1883 map. Adjacent to Lower Icknield Way.
2	M	M/H	M/H	M/H	M/H	M	M/L	Field boundaries shown on 1883 map. Adjacent to Lower Icknield Way.
3	M/H	M/H	M/H	M/H	M/H	M	M/L	Small field parcel with strong sense of landscape character. Boundaries as shown on 1883 map. Forms part of rural character to approach to village.
4	M	M/H	M/H	M/H	M/H	M	M/L	Visually open medium size field parcel with little opportunity to mitigate development in keeping with existing character. Rural character with some loss of field pattern. At boundary of conservation area.
5	M/H	M	M/H	M/H	M/H	M	M/L	Forms part of rural approach to village from north with views to AONB in distance. Adjacent to boundary of conservation area. Little sense of connection to existing settlement.
6	M	M/H	M/H	M	M/H	M	M/L	Field boundaries shown on 1883 map and shown as allotments. No longer used as allotments. Adjacent to short section of conservation area boundary. Some visual connection with existing settlement edge. Views to site from Lower Icknield Way
7	M/H	M	M/H	M	M/H	M	M/L	Allotments shown here on 1883 map. Currently used for allotments. Adjacent to boundary of conservation area. Potentially part of setting to conservation due to long period of continuous use as allotments. Valued locally. Good sense of enclosure.
8	M/H	M/L	M	M	M	M	M	Field boundaries as shown on 1883 mapping. Now used as recreation ground. Locally valued as a recreational space. Good sense of visual enclosure. Relates to existing settlement.
9	H	M/H	H	M/L	M/H	M/H	L	Parcels 9 and 10: Within the Kingston Blount Conservation Area. Thought to be former 'crofter's' fields. Strong sense of rural character. Contributes to sense of visually readable history of development of the village.
10	H	M/H	H	M/L	M/H	M/H	L	See above
11	M/H	M	M/H	M/L	M	M/H	M/L	Commentary as per parcels 9 and 10. Visual sensitivity slightly lower due to sense of enclosure due to modern close board fencing.
12	M	M/L	M/L	M/L	M/L	M	M/H	Good sense of enclosure due to surrounding vegetation. Limited views into the site from publicly accessible locations on approach to village and in views from AONB. Former parkland landscape. Remaining feature is an avenue of trees shown on 1883 mapping.
13	M/H	M/H	M/H	M/H	M/H	M/H	L	Parcels 13, 14, 15 and 16: Parkland/estate landscape character surrounding the (unlisted) Kingston House. Attractive mature trees with AONB in distance. Potential setting to AONB. Part of character of rural approach to the village from south. Readable history of village development. Adjacent to boundary of conservation area.
14	M/H	M/H	M/H	M/H	M/H	M/H	L	See above
15	M/H	M/H	M/H	M	M/H	M/H	L	See comments above. Also lies within conservation area boundary.

16	M/H	M	M/H	M	M/H	M/H	L	See comments above. Also lies within conservation area boundary.
17	M/H	H	H	H	H	M/H	L	Parcels 18 and 19: Open field parcel used for arable. Likely to be considered as the setting to AONB. Views from the adjacent Ridgeway National Trail. Strong rural character. Some gappy hedgerows. Relates poorly to existing settlement.
18	M/H	H	H	H	H	M/H	L	As for parcel 18.
19	M	H	M/H	H	H	M/H	L	Parcels 20 and 21: Less strong landscape features than parcels 18-19. Likely to be visual setting to AONB. Forms part of rural approach to village. Relates poorly to existing settlement in visual terms.
20	M	H	M/H	H	H	M/H	L	See above.
21	M	H	M/H	H	H	M/H	L	Large open field parcel used for arable crops. Weak landscape pattern. Visually open. Views from Ridgeway National Trail. Likely to be in setting to AONB.
22	M	M/H	M/H	M/H	M/H	M/H	L	Small field parcel with weak landscape structure. Visually open to AONB to the south. Potentially in setting to AONB. Some relationship to existing development at village periphery. Some potential to mitigate
23	M	M/H	M/H	M/H	M/H	M/H	L	Parcels 24 and 25 now form one larger field parcel. Some lost boundary features. Visually open to AONB in south. Potential setting to AONB. Unlikely to be able to accommodate development without altering landscape character.
24	M	M/H	M/H	H	H	M/H	L	See above.
25	M/H	M/H	M/H	M/H	M/H	M/H	L	Small field parcel surrounding former Aston Rowant Station. Strong landscape structure. Visually enclosed. Views from the Ridgeway adjacent to southern side. Likely to be in setting to AONB.
26	M	M/H	M/H	M/H	M/H	M	M/L	Large open field parcel. Field boundaries shown on 1883 map. Adjacent to Lower Icknield Way. Forms part of rural approach to village on Stert Road. Visually relates poorly to existing settlement as a location for future residential development.
27	M	M/H	M/H	M/H	M/H	M	M/L	Small field parcel with weak landscape structure. Has a role in rural character of views on approach to village on Stert Road. Has a role in rural character of views from public footpath no 115/7.
28	M/L	M/H	M	M/H	M/H	M	M/L	Small field parcel with some loss of landscape structure and occasional detractors. Some enclosure from roadside hedgerow. Weak relationship to settlement edge.
29	M	M/H	M/H	M	M	M/H	M/L	Large arable field lying adjacent to conservation area boundary. Weak landscape structure. Visually open views to AONB. Potentially within setting to AONB. Mitigation limited. PROW 115/7 lies at norther edge. Forms part of separation between villages.
30	M	M/H	M/H	M	M/H	M	M/L	Parcels 30 and 31 used as well-maintained cricket pitches. A valued community asset. Strong landscape structure to western and northern boundaries. Bisected by footpath 115/7. Creates separation between the spring line villages when viewed from Chinnor Road and PROW 115/7. A land use that contributes to village character.
31	M	M/H	M/H	M	M/H	M/H	L	See comments for parcel 30. Parcel 31 also visible from the AONB and may be considered to be within its setting.

32	M/H	M	M/H	M/H	M/H	M/H	L	Parcels 32 and 33: Appears to be part of former parkland landscape associated with the Aston House Estate. Strong landscape structure with some mature parkland trees and trees along field boundaries. Bisected by PROW 115/7.
33	M/H	M	M/H	M/H	M/H	M	M/L	See above
34	M/H	M	M/H	M/H	M/H	M	M/L	pattern as shown on 1883 mapping. Some strong landscape structure. Small watercourses to south and east. Does not relate to existing settlement edge.
35	M	M/H	M/H	M/H	M/H	M	M/L	Small isolated field parcel. Lower Icknield Way follows northern boundary creating greater visual sensitivity. Good landscape structure.
36	M	M/H	M/H	M/H	M/H	M	M/L	Shown as allotments on 1883 mapping. Now small isolated field parcel used as pasture. Greater visual sensitivity due to proximity of Lower Icknield Way.
37	M	M/H	M/H	M/H	M/H	M	M/L	Field boundaries as shown on 1883 mapping. Lies adjacent to the Lower Icknield Way from where there are views across the field parcel. Larger more open arable field parcel.
38	M	M/H	M/H	M/H	M/H	M	M/L	Shown as allotments on 1883 mapping now used as pasture. Distinctive irregular field pattern linking to field parcel 37. Limited potential to mitigate development without being out of keeping with existing landscape character.
39	M	M	M	M/H	M/H	M	M/L	Lying adjacent to conservation area boundary. Potentially forming part of its setting. Field pattern partly discernable. Potentially some loss of boundary features. Presence of mature trees and hedgerow features
40	M	M	M	M	M	M/H	M/L	Now appears to be substantially connected to parcel 39 and grassed. Strong landscape features such as mature trees and hedgerows creates a sense of enclosure. Adjacent to boundary of conservation area and potentially within its setting.
41	M/H	M/H	M/H	M/L	M	M/H	L	Shown as an orchard on 1883 mapping and appears to be an orchard at present. This use contributes to the rural landscape character of the village as seen from 'The Green'. Lies within the conservation area boundary.
42	M	M	M	M/H	M/H	M	M/L	Strong landscape structure creates good sense of enclosure. Landscape structure at field boundaries and following the alignment of the watercourse running through the centre. Used as pasture. Adjacent to conservation area boundary.
43	M	M	M	M	M	M/H	M/L	A small field parcel now use for grazing horses. Appears to be some loss of landscape features, northern field boundary now fenced. Good landscape structure to west along Church Lane. Within conservation area and opposite two listed buildings on Church Lane. Some potential to mitigate effects on views through reinstatement of landscape structure.
44	M	M/H	M/H	M/H	M/H	M	M/L	Formerly one field parcel now subdivided into quadrants, presumably to accommodate requirements of current use as a horse training centre. Some historic landscape structure. Some more recent structural planting following strong rectilinear pattern. Good sense of enclosure. Limited relationship to existing settlement edge. Views into the parcel from Lower Icknield Way.

45	M	M/H	M/H	M/H	M/H	M	M/L	Small field parcel. Appears to be used as part of the horse training ground. Strong landscape structure to eastern boundaries creates enclosure in these directions. Lies adjacent to Lower Icknield Way with weaker structure at this boundary. Little relationship to existing settlement edge.
46	M	M/H	M/H	M/H	M/H	M	M/L	Former parkland landscape, presumably associated with Aston House. Now site of a domestic property and associated gardens. Strong landscape structure to boundaries. Good sense of visual enclosure. Little relationship to existing settlement edge.
47	M	M/L	M/L	M	M	M	M	Small field parcel with strong landscape structure adjacent to bridleway 115/15 (a continuation of Church Street). Good sense of enclosure. Some physical and visual relationship to settlement edge.
48	M	M/H	M/H	M/H	M/H	M	M/L	Parcels 48, 49 and 50: Former parkland landscape, presumably associated with Aston House. Now used as part of horse training centre and stud. This land use has created a strong rectilinear landscape pattern over the former parkland. The avenue of trees remains a readable part of historic landscape. Little relationship to existing settlement edge.
49	M	M/H	M/H	M/H	M/H	M	M/L	See above
50	M	M/H	M/H	M/H	M/H	M	M/L	See above
51	M	M	M	M/H	M/H	M	M/L	As for parcels 48-50 this is a former parkland landscape now part of the horse training centre and stud. Greater sense of enclosure than in the wider training centre. Some landscape detractors. Weak relationship to existing settlement.
52	M	M/L	M/L	M	M	M	M	Former parkland landscape now enclosed and used for grazing horses. Strong landscape structure limiting views into wider countryside.
53	M	M/H	M/H	M/H	M/H	M/H	L	former parkland landscape now with strong rectilinear landscape pattern imposed by current land use. Few historic landscape features. Weak relationship to existing settlement. Lack of internal landscape structure limits opportunities for mitigation. M/H value as visible from Beacon Hill viewpoint in AONB and likely to be part of setting.
54	M	M/H	M/H	M/H	M/H	M/H	L	See above.
55	M	M/H	M/H	M/H	M/H	M/H	L	See above.
56	M/H	M	M/H	M	M/H	M	M/L	Part of former parkland landscape associated with Aston House. Remains readable as parkland with open views from Aston Rowant Road, grazed pasture and mature specimen trees. Contributes to character of village. Good association with existing settlement. Affords glimpsed views of Chilterns AONB from highway.
57	M/H	M/L	M	M/H	M/H	M	M/L	Enclosed field parcel at Chinnor Road junction. Part of former parkland landscape. Weak visual and physical association with existing village core.
58	M	M	M	M/H	M/H	M/H	L	Part of former parkland landscape. Recent land use for horse grazing has imposed strong rectilinear field pattern. Occasional remaining landscape features, namely specimen trees and the fish pond. Strong sense of enclosure within this medium sized field parcel. Limited opportunity to accommodate small scale development without affecting landscape character.



59	M	M/L	M/L	M	M	M	M	Three small field parcels. Strong landscape structure with mature trees along boundaries. Good sense of enclosure. Has a visual relationship to existing village development.
60	H	M/H	H	M/H	M/H	M/H	L	Wooded copse. Former parkland associated with Kingston House. Contributes to wooded setting on approach to Aston Rowant.
61	M	M/H	M/H	M/H	M/H	M/H	L	Triangular field parcel at junction of A40 London Road and Chinnor Road. Field of pasture with some strong landscape structure. Character influenced by adjacent hotel and highways. Visible from Beacon Hill and likely to be setting to AONB.
62	M/H	M/H	M/H	M	M/H	M/H	L	Small green at edge of Kingston Blount. Contributes to rural character of the village. Within conservation area. Visually open.
63	M/H	M/H	M/H	M	M/H	M/H	L	Village green at centre of Aston Rowant. Mature tree specimens. Strong sense of landscape character. Within conservation area. Used for community events.

Ecological Services

Green Infrastructure

Landscape and Visual Impact Assessment

Landscape Character Assessment

Habitats Regulations Assessment

Strategic Environmental Assessment

Sustainability Appraisal



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