



## 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.

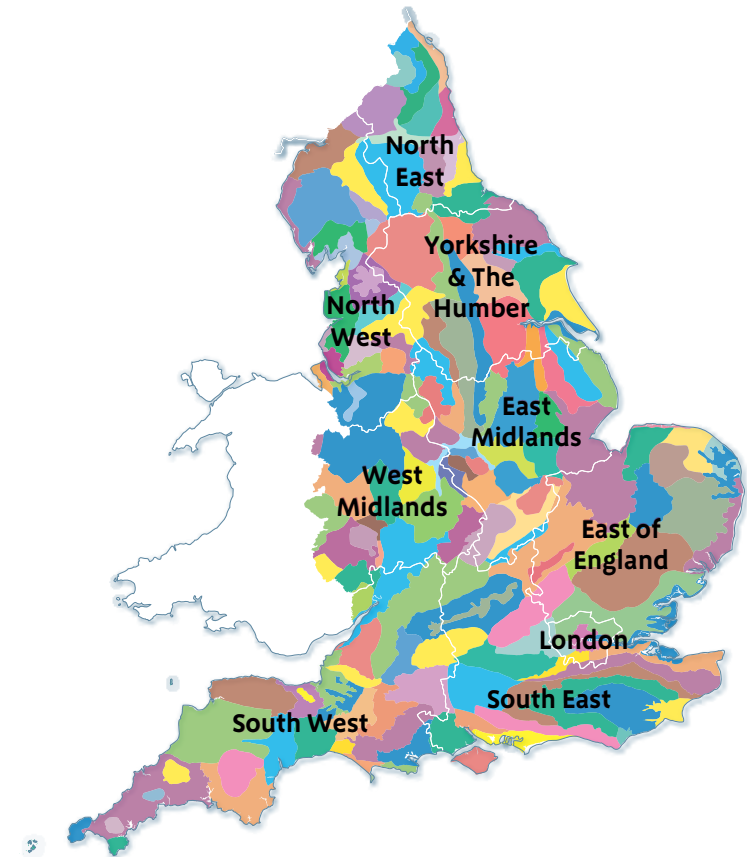
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and 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 long, curved belt of the Wealden Greensand runs across Kent, parallel to the North Downs, and on through Surrey. It moves south, alongside the Hampshire Downs, before curving back eastwards to run parallel with the South Downs in West Sussex. Around a quarter of the NCA is made up of extensive belts of woodland – both ancient mixed woods and more recent conifer plantations. In contrast, the area also features more open areas of heath on acidic soils, river valleys and mixed farming, including areas of fruit growing.

The area has outstanding landscape, geological, historical and biodiversity interest. Some 51 per cent of the NCA is covered by the South Downs National Park, Kent Downs Area of Outstanding Natural Beauty (AONB) and Surrey Hills AONB – a testament to the area's natural beauty. The underlying geology has shaped the scarp-and-dip slope topography, with its far-reaching views, but it has also had a significant bearing on the area's sense of place: there are clear links between vernacular architecture, industry and local geology. The heritage assets provide vital connections to the NCA's industrial, military and cultural history, and include distinctive deer parks and more recent 18th-century parklands. Biodiversity interests are represented by internationally and nationally designated sites alongside numerous local sites and other non-designated semi-natural habitats. The internationally designated sites include three Special Protection Areas (SPAs), two Ramsar sites and eight Special Areas of Conservation (SAC), representing the outstanding value and quality of the heathland, woodland, wetland and coastal habitats found within the NCA. In addition, fragments of acid grassland and parkland landscapes add to the overall diversity of habitats.

The south-western part of the area remains essentially rural, with only small market towns such as Petworth and Petersfield, but eastwards from Dorking the character becomes considerably more urbanised, with many towns including Maidstone, Reigate, Ashford and Folkestone. The area forms a major transport corridor, with the M25, M20 and M26 motorways and other major road and rail routes all running through it.

A short coastal stretch extends from Folkestone to Hythe, with a heavily developed hinterland: as a result, most of the coastline is protected by coastal defences. The exception is Copt Point, where the eroding cliffs are designated for their wildlife and geological interest. This part of the coastline is also part of the defined Dover–Folkestone Heritage Coast. The coastline offers a contrasting recreational experience from that associated with the heathlands, wetlands and woodlands of the wider NCA.

Click map to enlarge; click again to reduce.

Development pressures are likely to pose significant challenges within the NCA, with increasing demands on water resources, the landscape, biodiversity and the sense of place. Well planned green infrastructure is likely to play a critical role in both new and existing developments, to bring about a range of economic, social and environmental benefits. The creation of resilient ecological networks will become increasingly important, especially as our climate changes. There are opportunities to strengthen the networks of semi-natural habitats – particularly wetlands, woodlands and heathlands – integrating them into the mixed farmed landscape and taking action to reduce further fragmentation.



Fields near Petworth, West Sussex.

## Statements of Environmental Opportunity

- **SEO 1:** Protect and manage the nationally recognised and distinctive character of the landscape, conserving and enhancing historic landscape character, tranquillity, sense of place, and the rich historical and geological heritage of the Wealden Greensand. Enhance access provision where appropriate, to maintain public benefit from and enjoyment of the area.
- **SEO 2:** Protect, manage and significantly enhance the mosaic and connectivity of semi-natural habitats within the mixed farmed landscape – particularly the internationally important woodland and heathland habitats – for the benefit of biodiversity, pollination, soil and water regulation, landscape character and enhanced adaptation to climate change.
- **SEO 3:** Manage and significantly enhance the quality of the characteristic wetland and water environment of the Greensand. This will contribute to sustainable flood risk management, will benefit the regulation of water quality and water availability, as well as enhancing the sense of place, biodiversity, recreation and wetland habitat adaptation to climate change.
- **SEO 4:** Plan to deliver a network of integrated, well managed green spaces in existing and developing urban areas, providing social, economic and environmental benefits, and reinforcing landscape character and local distinctiveness – particularly on or alongside the boundaries of the designated landscapes within the Wealden Greensand.

## Description

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

The curved Greensand ridge partially encircles the adjoining Low Weald NCA, while its outer edge is rimmed by the chalk outcrops of the North and South Downs, and the Hampshire Downs in the west. The ridge affords far-reaching views over the Low Weald, South Downs and London. In Kent, the ancient coastline reflected in the Lympne Escarpment overlooks the Romney Marshes.

In the south-west the Western Rother joins the Arun, which drains south into the South Downs NCA and on to the coast. In the north-west the rivers Wey and Mole drain north through the North Downs, and into the Thames. Further east the River Medway drains north through the downs, via the Medway Gap, and into the Greater Thames Estuary. The source of both the Upper Great Stour and the East Stour is on the Greensand ridge: these two rivers join to form the Great Stour, which flows north-east through the North Downs and the North Kent Plain. The Kent Lower Greensand groundwater body is considered a major aquifer, important for public and industrial water supply both within and outside the NCA.

Although it is only a short section, the management of the coastal stretch between Folkestone and Hythe influences and is influenced by the coastal stretches in adjoining NCAs (North Downs and Romney Marsh). Sediment supply in the development and denudation of beaches has a critical influence on the rate of coastal erosion and coastal squeeze.

A major transport corridor runs through the eastern part of the NCA, including the Channel Tunnel rail link connecting Folkestone to London.



**View north from the Greensand ridge across Thursley Common. The dry heath, dominated by ling and bell heather, supports a wide range of wildlife including uncommon reptiles and rare heathland birds.**

## Key characteristics

- A long, narrow belt of Greensand, typified by scarp-and-dip slope topography, including outcrops of Upper Greensand, Gault Clay and Lower Greensand. The Greensand forms escarpments separated by a clay vale: the overall undulating and organic landform – particularly in the west – gives a sense of intimacy to the landscape. Leith Hill in Surrey is the highest point in south-east England.
- There are extensive areas of ancient mixed woodland of hazel, oak and birch, with some areas having been converted to sweet chestnut coppice in past centuries. These areas reflect the diverse geology, including the distinctive chalk grassland elements within the East Hampshire Hangers Special Area of Conservation (SAC), the wooded commons ('charts') of East Surrey and West Kent, and conifer plantations.
- Semi-natural habitats include: remnant lowland heathland, mostly concentrated in West Sussex, Hampshire and West Surrey; the wetlands associated with the River Arun in West Sussex; and unimproved acid grasslands found in commons, parklands, heathland and other areas of unimproved pasture.
- Fields are predominantly small or medium, in irregular patterns derived from medieval enclosure. Boundaries are formed by hedgerows and shaws, with character and species reflecting the underlying soils. On the clay, hedgerows are dense and species-rich, with occasional standard oaks. On more acidic soils they generally consist of hawthorn and blackthorn, also with occasional oak trees, and often trimmed low.
- Agricultural land comprises a mosaic of mixed farming, with pasture and arable land set within a wooded framework. There is a fruit-growing orchard belt in Kent and also around Selborne in Hampshire.
- The rural settlement pattern is a mixture of dispersed farmsteads, hamlets and some nucleated villages. Large houses set within extensive parks and gardens are found throughout the area.

**Continued on next page...**



**Apple harvest at Blackmoor Estate, Hampshire.**

## Key characteristics continued

- In the east of Kent, the Wealden Greensand has a gentler and more open aspect than in the wooded west. This part of the area is also more marked by development, with the presence of major towns and communication corridors such as the M26, M25 and M20 motorways and railway lines including the Channel Tunnel Rail Link (High Speed 1).
- The local built vernacular includes the use of Greensand, ragstone and, in the west, malmstone, bargate stone, plus dark carrstone patterned in the mortar between stones ('galleting') in Surrey, as well as timber-framing and weatherboarding.
- There are a range of historic landscape features, including field monuments, old military defences, prehistoric tumuli, iron-age hill forts, Roman forts, the Royal Military Canal, small quarries and relics of the iron industry (including hammer ponds). Sunken lanes cut into the sandstone are a historic and characteristic feature, as are older deer parks and more recent 18th-century parklands.
- Surface water is an important feature across the Greensand, with many streams and rivers passing through the NCA: the Western Rother, Wey, Arun, Medway and the Great and East Stour.
- The Greensand ridge meets the coast of Kent between Folkestone Warren and Hythe. While most of the coastal strip is now built up and protected by sea defences, the undeveloped sea cliffs at Copt Point provide important geological exposures, are designated for their nature conservation interest and fall within the Dover-Folkestone Heritage Coast.

## Wealden Greensand today

The local character of the Wealden Greensand varies as a result of changes in local topography, soils and land use, but it is unified throughout by the underlying geology and the distinctive springline settlements below the Downs. The scenic beauty and special qualities of the landscape are recognised in the fact that 51 per cent of the area has been designated as protected: the South Downs National Park in the south-west, the Surrey Hills Area of Outstanding Natural Beauty (AONB) to the west and the Kent Downs AONB to the east. Panoramic views across adjoining NCAs are frequent and extensive from the Greensand ridge above the scarp face.

Overall the NCA has a well-wooded feel, accounting for 25 per cent of the NCA, with extensive areas of woodland, both ancient mixed woods and conifer plantations. Variety is provided by more open areas of heath and acid grasslands on acidic soils, by the river valleys, by the parkland landscapes and by the mixed farming found throughout the area, with marked differences between the western, central and eastern areas.

To the west, in Hampshire, Sussex and West Surrey, the Greensand forms an intimate landscape with a diverse character – from the more or less parallel sandstone ridges to the steep and dramatic scarp slopes, and the rounded clay vales containing river valleys with broad plains. The small pasture fields and linear woodlands of the scarps and ridges give way to larger and more regular field patterns and regular-plan farmsteads – the result of the successive reorganisation and enlargement of farms. This arable landscape of large, geometric fields is encouraged by the light, fertile soils of the Western Rother plain that cuts through the sandstone. It provides a local contrast with the more intimate nature of the sandy soils dominated by small pasture fields. On the higher ground, these sandy soils support some extensive heathland, including two Special Protection Areas (SPA) and three SAC. These heathlands give the landscape an impressive purple hue in mid to late summer, from the darker purples of the bell heather to the soft mauves of the ling/common heather. The species associated with these habitats – such as the Dartford warbler, nightjar, woodlark, amphibians, reptiles and butterflies (including the silver-studded blue butterfly and green hairstreak) – all add diversity to the landscape in sound, colour and texture.



View across Ockley Common.

A notable feature of the southern arm of the Wealden Greensand is the Arun Valley, which is designated as an SPA and a Ramsar site: it is a wetland of international importance for waterfowl including shoveler, teal, wigeon and Bewick's swan, which can all be found overwintering at the site. The site is also a candidate SAC for the populations of shining ram's-horn snail that it supports. The Arun Valley is a complex of meadows and ditches that contain many rare plants including cut-grass, true fox-sedge and sharp-leaved pondweed. As well as being botanically important, the nature reserves at Amberley Wildbrooks and Pulborough Brooks are a key resource for access and environmental education within the valley.

Further north and east, from Hampshire and into Surrey, the slopes become steeper and are typically densely wooded: the steep hanger ash, chalk-beech and mixed woodlands of East Hampshire are a locally dominating feature and have been designated as an SAC for their rare woodland composition. These woodlands are also important for the assemblages of invertebrates, plants, bryophytes and birds that they support. Farming is mixed and includes commercial fruit growing near Selborne. Hedgerows tend to mark the boundaries of the small, irregular fields. The intimate, almost secretive, feel of much of the west of the Wealden Greensand is reinforced by the deep, stream-cut gulleys and tree-lined, winding, sunken lanes leading to small settlements built of sandstone or malmstone. This mixed intimate character continues across Surrey, with woodland cover increasing. Surrey is the most wooded part of the area, with a high proportion of ancient mixed wood.

Besides the woodland, the Surrey Greensand is characterised by open rolling farmland. In the south, a traditional farmscape of small fields and thick hedgerows is retained. On flatter land, however, arable use is more prevalent. This area is heavily populated with settlements such as Redhill, Reigate and Dorking.



View along the Lymgne escarpment.

The proximity to London and the longstanding affluence of this area are reflected in the numerous notable houses, parks and gardens. This affluence continues to shape the landscape, with some of the farmland given over to smallholdings and recreational uses such as pony paddocks. In many areas, the settlements bring a suburban feel that contrasts with the essentially rural landscape of the south-western end of the NCA.

The main river valley in Surrey is that of the River Wey, which cuts a broad, watery plain with open meadows and typical waterside vegetation (including willow, alder and wet meadows). The Surrey Greensand is particularly important for recreation, as it is easily accessible from London and many of Surrey's major towns. The Wey provides an opportunity for water-based activities, as well as cycling and walking routes along the towpath. The overall landscape, although mixed, is unified by the wooded character engendered by the many woodlands and shaws.

Further east, into Kent and beyond, the dramatic, wooded topography becomes less distinctive: being less wooded, the landscape here does not afford such an impression of intimacy. The area is also more marked by modern human influence, with major towns such as Maidstone, Sevenoaks and Ashford, and numerous communication routes. Notable among the latter are the M25, M26 and M20 motorways, and other major road and rail routes. Generally, the Kent Wealden Greensand in the east is relatively more open with mixed farming. The central area of the belt, near the Medway, where lighter loams occur, is an important commercial fruit growing area. Cobnut production, while much reduced in extent, is still a notable feature around Plaxtol. While orchards have tended to be replaced by arable fields, there is some evidence of new orchard planting occurring on the ridge. The River Medway flows through Maidstone and is a key recreational asset, offering riverside walks and boat trips. Further east,

the Great Stour and East Stour both rise on the Greensand before joining upstream of Ashford and flowing northwards. A key characteristic of this area are the large areas of woodland dominated by sweet chestnut coppice, originally planted to support the hop industry and more recently for use as renewable fuel.



Cliffs at Copt Point.

At its south-eastern extreme, the Greensand forms a notable scarp, formerly a sea cliff, giving extensive views over the Romney Marshes. The NCA meets the coast in Kent, extending from Folkestone to Hythe. Most of the coastal hinterland is heavily developed and protected by sea walls, groynes and shingle beaches – with the exception of Copt Point, where undeveloped, eroding cliffs are designated for their wildlife and geological interest. This part of the coastline forms part of the defined Dover–Folkestone Heritage Coast. The beaches and coastal amenities provide important recreational opportunities and contribute to the local economy.

## The landscape through time

The Wealden Greensand NCA follows the outcrop of the Lower Greensand Escarpment of the Wealden Anticline. The oldest rocks in the NCA (bordering the Lower Weald NCA) belong to the Lower Cretaceous Weald Clay Formation, which is in turn overlain by the Lower Greensand Group and the Gault and Upper Greensand Formations. The complete sequence varies in age from approximately 125 to 100 million years old. At this time deposition was occurring in the Wessex Basin, which was enclosed by uplands to the north, west and south. The basin was initially dominated by the fluvial sediments of the Wealden Group (exposed in the Low Weald and High Weald NCAs). The subsequent rise in sea level led to the deposition of the marine Lower Greensand sediments, which include the Atherfield Clay (offshore muds and silts) and the Hythe, Sandgate and Folkestone Formations (shallow marine sands). The Greensand is so-called due to the green mineral glauconite, however this is usually oxidised to more a typical yellow or brown. Another characteristic rock type of the Lower Greensand is the 'rag and hassock' of the Hythe Formation – 'rag' being a hard, sandy limestone and 'hassock' a sand speckled with glauconite. The continued rise in the sea level and the establishment of a deeper sea led to the deposition of the Gault Clay and Upper Greensand. Eventually, the Upper Cretaceous chalk formed the North and South Downs that now surround this NCA.

The collision of Africa with Europe led to a period of mountain-building known as the Alpine Orogeny (from about 65 to 2.5 million years ago), with associated folding and faulting in south-east England that produced the characteristic anticline of the Weald. Although the area was not glaciated during the Pleistocene, it was affected by interglacial and glacial climate changes. Erosion during the tundra-like cold periods produced landslips, in

particular cambering and gullying, between about 135,000 and 12,500 years ago. A number of the gullies have been filled by Pleistocene wind-blown sand and silt known as loess. The nutrient-poor, acid, sandy soils covering the Folkestone and Hythe Beds form a broad escarpment that is often associated with tracts of heaths and commons. The more fertile soils over the Sandgate and Bargate Beds, which have a high lime content, give rise to heavier and wetter soils that are often dominated by pasture. The heavy Atherfield Clay lies below. The Upper Greensand has outcrops of calcareous sandstone ('malmstone') in Hampshire and West Sussex, which was used as a building material. It closely resembles the calcareous Kentish ragstone, which occurs as part of the Lower Greensand at the opposite end of the area. The local architecture is linked to the underlying geology, with Greensand stone giving many buildings a distinctive character and local identity.

The Wealden Greensand has been occupied since the earliest times, with the presence of Palaeolithic flint tools at Oldbury Hill in Kent and traces of a Neolithic hearth at Abinger. On the whole, the generally nutrient-poor Greensand soils have not been as extensively cleared for agriculture as some other areas, and many ancient woodlands have survived – although often in fragmented patches and on steeper slopes. Woodlands throughout the area provided a renewable source of fuel and materials for domestic, agricultural and industrial use. Coppicing trees and shrubs, such as hazel, hornbeam, sessile oak and sweet chestnut, was an important part of the rural economy and also led to the development of a rich woodland flora. Coppice products included fencing materials, firewood, thatching spars, hop poles (mostly sweet chestnut in Kent) and charcoal. In the western part of the NCA, where clay ironstone occurs, coppice woodlands were vital for the early iron industry. This was responsible for the large hammer ponds, like the Waggoners' Wells within the Bramshott and Ludshott Commons Site of Special Scientific Interest (SSSI) in Hampshire.

The wide variation in soil acidity and fertility across the NCA is reflected in the range and diversity of both agriculture and the semi-natural habitats that occur within it. Accordingly, this was essentially an area of mixed farming, with the balance differing locally: fruit growing in Kent, dairying around Petersfield and hop growing around Maidstone. While the NCA remains a mixed farming area today, the balance has shifted, with dairying significantly reduced and hop gardens only functional in very few instances. Areas of fruit (mainly commercial as opposed to traditional), pasture and arable are all still prevalent. Most field patterns still reflect the irregularity of ancient enclosure or enclosure by agreement, with regular Parliamentary-type enclosure generally restricted to late enclosure of heathland.

Heathland was very extensive on the Greensand ridge as recently as the 18th century, having developed on the sandy and acidic soils that were maintained as open and grazed landscapes since at least the Bronze Age. Once an important part of the rural economy, heathland provided grazing land, bedding for stock and a source of fuel. As the markets for some of these products declined, so did their place in the rural economy. As a result, much of this former heathland has been built on, converted to more productive agricultural land or forestry plantations, or has suffered due to lack of management, resulting in a dramatic decline over the past century. In other places, the absence of grazing stock and traditional use of heathlands has allowed bracken to spread, and pine, birch and oak trees to become established. These trees have replaced the typical wet and dry heathland plant communities, and a high proportion of the original Greensand heaths are now covered with secondary woodland.

The system of 'common land', whereby groups of people had collective grazing or harvesting rights over an area of land, had much to do with the creation and survival of some important Greensand habitats. Heathland was often common land, as were some of the ancient woodlands. Cattle and sheep grazed the wooded commons, and in autumn these areas provided foraging for pigs. Commoners could also gather firewood from the woods. Such wooded commons (or charts) were mostly found in East Surrey and West Kent. Although much overgrown, the charts of today still display a typical structure and suite of species that are the result of their traditional use.

The Greensand is scattered with landmarks that document the activities of previous centuries and make important contributions to England's heritage. These include Waverley Abbey, remains of the first Cistercian abbey in England, and a series of historic bridges over the River Wey, linked to the remnant water meadow system and thought to have been built by the monks of the



Kent's last medieval deer park at Knole.

Abbey. The Chilworth Gunpowder Mills also provide a link to a thriving past industry that used water from the Tillingbourne, a tributary of the Wey, to power the mills. For a time, these mills were the only authorised gunpowder producer in Britain. Iron making (using the local ironstone) and Wealden timber (for charcoal) were important industries, with numerous hammer ponds found along the foot of the north-west escarpment. Old quarries (where ironstone, building stone and sand on the heathland areas were all extracted) are features of the landscape and a reminder of the economic value of the underlying geology – as are today’s operational mineral working sites.

The woodland provides a backdrop to the many landscaped parks of the area, and has been used by designers such as Lancelot ‘Capability’ Brown to frame 18th- and 19th-century landscapes. Many of these parkland landscapes remain today. Oast houses are a highly characteristic farm building type associated with the hop industry, and many timber-framed buildings dating from the 15th and 16th centuries survive – including barns and Wealden hall houses (‘A type of vernacular medieval timber-framed hall house traditional in the south-east of England’).

Settlement across the area is a mixture of dispersed farmsteads and hamlets, and some nucleated villages, often linked by small, deeply sunken lanes through the easily eroded areas of soft sandstone. While the south-western part of the area remains essentially rural, improved transport links from the later 19th century led to increased development of the eastern half as it became a commuter belt. Significant 20th century development has altered the character of much of the area east of Dorking, with the expansion of towns such as Maidstone, Reigate, Ashford and Folkestone, and the development of major transport networks including motorways and the high-speed Channel Tunnel Rail Link.

## Ecosystem services

The Wealden Greensand 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 Wealden Greensand NCA is contained in the ‘Analysis’ section of this document.

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

- **Food provision:** An area of mixed farming that produces significant amounts of cereals and other arable crops. Also livestock, including sheep, pigs and cattle, and notably fruit growing and other horticultural crops – particularly in Kent. Includes some of the most productive agricultural land in Kent, where the ridge is less pronounced and the soils are more fertile.
- **Biomass energy:** The existing woodland cover (25 per cent of the NCA) offers significant potential for the provision of biomass through bringing unmanaged woodland under management. The NCA has been identified as having a high potential yield for sweet chestnut coppice, while short rotation coppice is generally medium: central areas around Redhill and Reigate, where lighter loams occur, have been identified as being more suitable<sup>4</sup>.

<sup>4</sup> Energy crop guidance and yield maps – see: <http://archive.defra.gov.uk/foodfarm/growing/crops/industrial/energy/opportunities/>

- **Water availability:** The majority of the area overlies post-Carboniferous rock (a sandstone aquifer), with a small area in the west overlying a chalk aquifer. For the area of strata assessed, the quantitative status is considered to be poor<sup>5</sup>. Water availability in both surface waters and the aquifer is under pressure from existing abstractions for public water supply and (to a lesser extent) for industrial and agricultural supply. The Lower Greensand aquifer supports surface water flows and provides base flow to the internationally important wildlife sites of the Arun Valley – SPA, SAC, Ramsar and heathland sites that have water-dependent habitats. The aquifer has an important role in maintaining spring and base flows of rivers; any low flows may damage the ecology of rivers and wetlands.

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

- **Climate regulation:** The very acidic sandy and loamy soils include some thin, organic and peaty topsoils that are a store of carbon, associated with the area's remnant heathland habitats. Some of the loamy and clayey flood plain soils are peaty at depth, or include small areas of peaty soils. The woodlands of the NCA also play an important role in climate regulation. However, as many of the soils are droughty sands and coarse loams they generally have a low organic matter content, which could be enhanced by organic matter inputs.
- **Regulating soil erosion:** Freely draining, loamy and/or sandy soils make up 60 per cent of the NCA, and generally carry an enhanced risk of soil erosion on moderately or steeply sloping land where cultivated or bare soil is exposed. This is often exacerbated where organic matter levels are low

after continuous arable cultivation, or where soils are compacted. Wind erosion can also be an issue for many of these soils. The freely draining, sands, silts and coarse loam soils, can be at risk of increased erosion. Loamy and Clayey soils with impeded drainage can be prone to both capping and slaking, and are easily compacted by machinery or livestock if accessed when wet, increasing the risks of soil erosion by surface water run-off. In the south-west of the NCA, steeper sandy soils under arable cultivation are highly prone to erosion.

- **Regulating water quality:** The Water Framework Directive's first river basin management plan classification indicates that the stretches of the rivers that fall within the NCA are of variable quality, as is the groundwater<sup>5</sup>. Three Defra priority catchments – the Arun and Western Rother, the Medway, and the Stour – fall within the NCA. All seek to reduce diffuse pollution from agriculture. Within the Arun and Western Rother priority catchment, steeper, sandy soils under arable cultivation are highly prone to erosion: as a result, the Western Rother suffers from very high levels of siltation. The Medway and Stour catchments are also both prone to sedimentation from soil erosion and phosphate run-off. Water quality is also influenced by the presence of industry and urban development within the NCA.
- **Regulating water flow:** Flooding has been an issue within the NCA and the river catchments more widely. Land adjacent to both the Mole and Wey has been subject to significant flooding in the past, including flooding of urban areas along their course. Most notable is the very significant flooding of Godalming (in the Wealden Greensand) and Guildford (in the adjacent Thames Basin Lowlands NCA) on the course of the Wey in 1968.

<sup>5</sup> *Thames River Basin Management Plan*, Environment Agency (2009) ([www.environment-agency.gov.uk/research/planning/125035.aspx](http://www.environment-agency.gov.uk/research/planning/125035.aspx)) and *South East River Basin Management Plan*, Environment Agency (2009) ([www.environment-agency.gov.uk/research/planning/124978.aspx](http://www.environment-agency.gov.uk/research/planning/124978.aspx))

Guildford, although outside the NCA, is an area of high risk along the River Wey. Flood plain management in the wider catchment is identified as being a key mitigation measure. Maidstone is identified as an area of moderate risk along the River Medway<sup>6</sup>. Ashford is identified as being at risk from flooding and this risk is likely to increase as a result of climate change.

- **Regulating coastal flooding and erosion:** Long-term 'Hold the Line' policies are identified within the Shoreline Management Plan along the relatively small stretch of developed coastline that falls within the NCA between Folkestone and Hythe. The exception of Copt Point (where a policy of no active intervention is applied) will allow the undeveloped cliffs to erode, maintaining their environmental and geological value. For the rest of the stretch, preferred policies of 'Hold the Line' protect buildings, infrastructure and amenities. Identified implications are the narrowing of the intertidal area as a result of sea level rises, with the subsequent loss of fronting beaches – which are an important asset to tourism within the area – as well as a reduction in the long term in the amount of sediment available for downdrift frontages<sup>7</sup>.

#### Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration:** A sense of place is provided by the prominent Greensand ridge, which affords many far-reaching views over the Low Weald from the scarp top, as well as by the extremely varied landscape character – a result of the diverse underlying soils and geology, and the overlying land use. Also distinctive are the extensive areas of lowland heathland (in Surrey, Hampshire and Sussex) and ancient woodland, which include the distinctive hanger woodlands found on steeper slopes (notably in East Hampshire) and the wooded commons or charts characteristic of East Surrey and West Kent. Rivers draining the dip slope (and their associated wetland habitats) further support this varied character, as do the irregularly-patterned fields bounded by hedgerows and shaws, and the traditional fruit-growing areas of Kent. The rural settlement pattern of dispersed farmsteads, hamlets, some nucleated villages and tree-lined, sunken lanes adds to the distinctive sense of intimacy within the landscape in the south-west.
- **Sense of history:** The history of this landscape is evident in the predominantly irregularly-patterned fields and in the ancient road network, as well as in the area's prehistoric associations: including bronze-age tumuli near Petersfield and on the higher ground of heathlands in Sussex, iron-age hill forts at Holmbury, Anstiebury and Oldbury Hill, and Neolithic remains at Abinger. Aspects of history that are particularly striking in the landscape are the numerous large houses and designed parklands, including Petworth in Sussex, Knole, and Leeds Castle in Kent, and the traditional vernacular of local sandstone and patterned dark carrstone (known as 'galleting') – most notably in Surrey. The hammer ponds associated with iron workings along the foot of the north-west escarpment contribute to the sense of history and provide links with the area's industrial heritage.
- **Tranquillity:** Twenty-seven per cent of the NCA is classified as 'undisturbed' according to CPRE data, a decline from over 60 per cent in the 1960s. Tranquillity is most generally associated with the intimate rural landscape of the south-west (much of which falls within the South Downs National

<sup>6</sup> *River Medway Catchment Flood Management Plan*, Environment Agency (2009) (<http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geso1008bowj-e-e.pdf>)

<sup>7</sup> *South Foreland to Beachy Head Shoreline Management Plan*, Environment Agency (2006) ([www.se-coastalgroup.org.uk/sf-to-bh-2006/](http://www.se-coastalgroup.org.uk/sf-to-bh-2006/))

Park), in contrast with the more heavily developed eastern and central areas. Tranquillity is nevertheless likely to be associated with the extensive chain of heathlands and ancient woodlands that occur throughout East Hampshire, Surrey and West Kent: these remaining areas of tranquillity are important where development pressures are so high.

- **Recreation:** Recreation and access are supported by 3,315 km of public rights of way, including links to both the North Downs Way and South Downs Way national trails, as well as over 6,700 ha of open access land – around 5 per cent of the NCA. Part of the area to the south-west falls within the South Downs National Park, which seeks to offer wide-ranging opportunities for countryside recreation and access<sup>8</sup>. The Surrey Hills AONB and Kent Downs AONB also have much to offer in terms of recreation within inspiring landscapes. The woodland and heathland landscapes of Surrey and West Kent are particularly important for access, given their proximity to London and other significant urban areas, and also given increasing pressure for public recreation – particularly cycling and walking. The coastline offers a further recreational resource, as do the NCA's rivers – some of which are navigable, and are host to a range of water-based activities. These recreational opportunities offer benefits to physical and mental health, and to local economies, but there is a need to manage their impact on sensitive sites, where the ecology of these areas is at risk from significant footfall or from potentially damaging activities.
- **Biodiversity:** The NCA supports a variety of habitats and species. There are over 26,500 ha of Biodiversity Action Plan (BAP) priority habitat, covering around 18 per cent of the NCA. This includes lowland woodland (lowland mixed deciduous woodland (5,628 ha) and lowland beech and yew woodland (2,713 ha); lowland heathland (5,557 ha) and wetland fens (3,518

ha); wet woodland (2,936 ha); and coastal and flood plain grazing marsh (1,302 ha). The NCA has a number of international designations, with three SPAs, ten SAC and two Ramsar sites, indicating the area's contribution to international biodiversity.

- **Geodiversity:** The geodiversity of the Wealden Greensand NCA is of great importance. There are 18 SSSIs designated for their geology and 27 Local Geological Sites encompassing Cretaceous and Pleistocene geology, including classic exposures of Lower Greensand, Gault Clay, windblown sands or loess, and landslip features. Disused quarries and road cuttings are particularly important, as are the dramatic coastal sections of Folkestone Warren. The ridge itself gives spectacular views across the Low Weald, and Leith Hill is the highest point in Surrey. Key landscape features include the Devil's Punch Bowl at Hindhead and the Lympe Escarpment on the boundary with the Romney Marshes. As well as being of great importance in its own right, the geology is of fundamental importance to biodiversity. The complexity of the geology and soils has led to great variation in the vegetation that it supports. There are also clear links between traditional building materials and industries, which have been supported by the local geology; for example, ironstone was important in early iron production in the area.

<sup>8</sup> *The South Downs Management Plan, 2008–2013*, South Downs Joint Committee (2008) ([www.southdowns.gov.uk/about-us/key-documents](http://www.southdowns.gov.uk/about-us/key-documents))

## Statements of Environmental Opportunity

**SEO 1: Protect and manage the nationally recognised and distinctive character of the landscape, conserving and enhancing historic landscape character, tranquillity, sense of place, and the rich historical and geological heritage of the Wealden Greensand. Enhance access provision where appropriate, to maintain public benefit from and enjoyment of the area.**

### For example, by:

- Protecting the intimate rural character of the south-west of the NCA (part of the South Downs National Park) and the special qualities of the Kent Downs AONB and Surrey Hills AONB, working in partnership to identify management opportunities in accordance with the respective management plans.
- Conserving and enhancing the rural settlement pattern of dispersed farmsteads, hamlets and nucleated springline and riverside villages, and the network and character of ancient, winding, tree-lined, sunken lanes in the west, through sensitive planning and development control. This will benefit the landscape character, tranquillity and the sense of place and history. The management of trees alongside sunken lanes will maintain and enhance their botanical interest.
- Using an understanding of the area's traditional and historical architecture, its distinctive local materials (timber-framing with weatherboarding, Greensand, ragstone and, in the west, malmstone) and its patterns of settlement, to inform the appropriate conservation and use of historic buildings, and to plan for and inspire any new development so that it makes a positive contribution to local character.
- Maintaining and enhancing rights of way and open access throughout the area, improving links especially to the North Downs Way and South Downs Way national trails, and to towns and villages. Developing new permissive access to historical sites and quality green space as part of a cohesive network of inspiring access provision. Increasing the benefits of these routes for biodiversity, health and local businesses, and ensuring full compatibility with agriculture. Enhanced access permission will not be appropriate in all instances and needs to be balanced to ensure that areas that are particularly vulnerable to disturbance from recreational pressures are not compromised.
- Promoting sustainable tourism initiatives that help to reduce car dependency and can accommodate high visitor numbers while conserving the landscape and its tranquillity. Managing the impact of increased visitor numbers to sensitive sites.
- Restoring and creating broadleaved woodlands surrounding major transport corridors and urban areas to help reduce noise, light and air pollution, and to maintain and enhance the pockets of tranquillity.
- Maintaining the sense of intimacy within the landscape and the expansive views over the Low Weald, South Downs and London from the scarp tops.

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## Statements of Environmental Opportunity

**SEO 1: Protect and manage the nationally recognised and distinctive character of the landscape, conserving and enhancing historic landscape character, tranquillity, sense of place, and the rich historical and geological heritage of the Wealden Greensand. Enhance access provision where appropriate, to maintain public benefit from and enjoyment of the area.**

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- Conserving, managing and enhancing the nationally important and locally characteristic geodiversity, including the undeveloped sea cliffs between Folkestone Warren and Hythe, plus inland exposures of Upper Greensand in Hampshire and West Sussex, and the ragstone exposures of the Lympe Escarpment in Kent.
- Maintaining and enhancing access to geodiversity, providing educational and research opportunities, and linking communities with their local heritage, including through the sensitive restoration of redundant quarries, exploiting their biodiversity, recreational and geological potential.
- Restoring and managing the nationally important parklands (for example at Knole), the more recent 18th-century parklands and designed landscapes (as at Petworth), and the wood pasture habitats. Management works should be prioritised and informed by an assessment of the historic design, use and significance of the parkland.
- Supporting local initiatives for the restoration of traditional orchards and hop gardens that are characteristic of Kent, and parts of Hampshire and Surrey. Using and promoting local fruit varieties where viable, and where this provides links to our heritage and sense of place, and maintains genetic diversity.
- Protecting the integrity of earthworks and monuments (including numerous bronze-age tumuli on the higher ground of the Sussex and Surrey heathlands, and prominent iron-age hill forts such as at Holmbury, Anstiebury and Oldbury Hill) through appropriate management, including the reversion of arable to grassland, scrub removal and protecting sites from erosion.
- Conserving and improving the management of historical landscape features such as relics of the iron industry (including hammer ponds) and water mills. Conserving and restoring historic buildings including oast houses and timber-framed barns, while promoting opportunities for access, education and sensitive interpretation at historic sites.

**SEO 2: Protect, manage and significantly enhance the mosaic and connectivity of semi-natural habitats within the mixed farmed landscape – particularly the internationally important woodland and heathland habitats – for the benefit of biodiversity, pollination, soil and water regulation, landscape character and enhanced adaptation to climate change.**

**For example, by:**

- Protecting the distinctive beech and ash hanger woodlands of Hampshire on the steep chalk and Upper Greensand escarpment, including the East Hampshire Hangers SAC, supporting the continued small-scale management on the difficult scarp slopes and buffering the woodlands through appropriate land management options on adjoining land. These woodlands provide important links to the surrounding landscape, and so any opportunities to enhance their connectivity to other habitats should be maximised, integrating them into the wider farmed landscape and enhancing adaptation to climate change while benefiting biodiversity and the sense of place and history.
- Restoring and managing the extensive belts of ancient mixed woodland throughout the rest of the NCA, including the sessile oak woods on the acid, sandy soils of Surrey, West Sussex and Kent, the pedunculate oak woods with hazel coppice on the heavy Gault Clay, and the ash woodland on lime-rich Kentish ragstone outcrops. (Consideration must be given to those trees that may have been affected by ash die-back disease, adapting to the implications through a combination of selection, propagation and planting of resistant ash trees, and diversifying as appropriate.) Ancient mixed woodland should be significantly expanded on steeper slopes, helping to prevent soil erosion, especially within important valley catchments such as that of the Western Rother.
- Promoting opportunities for productive woodland management, to support existing markets for local wood products (including wood for fuel) and to encourage new ones. Where smaller woodlands form part of the mixed farm mosaic, seeking to integrate their management into the wider farm business.
- Maintaining or (where appropriate) restoring stock grazing in parks and wood pastures, and stimulating the re-introduction of traditional tree and woodland management (including pollarding, the encouragement of new tree generations and the restoration of woodland glades), benefiting biodiversity, and the sense of place and history.
- Managing and monitoring the threats posed by tree diseases and pests, and planning for climate change, researching appropriate species mixes to create robust and resilient woodlands.
- Restoring hedgerow boundaries and shaws, especially where they will help to impede cross-land flows (and thus further aid the regulation of water quality), maintain the predominantly irregular field pattern to benefit cultural heritage and the sense of place, improve the landscape character, and help to create a robust, interlinked wildlife network with enhanced resilience to climate change.

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**SEO 2: Protect, manage and significantly enhance the mosaic and connectivity of semi-natural habitats within the mixed farmed landscape – particularly the internationally important woodland and heathland habitats – for the benefit of biodiversity, pollination, soil and water regulation, landscape character and enhanced adaptation to climate change.**

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- Working with landowners to integrate arable habitats into the farming system. Encouraging the uptake of measures such as conservation headlands, low-input cereals and resource protection options on the sandy soils (such as grassland buffer strips) – to optimise the multiple benefits for biodiversity, water and soil regulation, and pollination services.
- Restoring the dry, humid and wet lowland heathlands (including large areas with SPA and SAC designation) through remedial work, including scrub and bracken management, and targeted conifer removal. This will enhance the adaptation of this important resource to climate change and will maximise the benefits for biodiversity. Where appropriate, considering opportunities for heathland creation, to improve connectivity of habitats and to allow for corridor management for the movement of species.
- Seeking to work with communities to reconnect them with their local heathland and common land habitats and to explore a combination of new and traditional management practices (such as stock grazing). This will help to create and maintain the structural diversity needed to support the range of plants and animals associated with these habitats. Appropriate management will also be needed to control invasive species.
- Managing woodland adjacent to heathland to help filter views of development beyond, enhancing habitat diversity while also allowing for species migration. These woodland belts can provide a robust recreational space close to where people live, and can help to relieve pressure on and buffer the more sensitive heathland habitats.
- Working in partnership to stimulate new markets for heathland products, providing a market driver to encourage and maintain viable and sustainable heathland management.
- Managing heathlands to maintain their ecological interest, while providing for the needs of the local communities and visitors. When considering changes to management practices, land managers should ensure that there is an engagement strategy in place and that this is implemented at an early stage of any decision-making process. The experience and understanding of the user should be enhanced through a variety of methods, including sympathetic interpretation and education, and the creation of local volunteer and ‘friends of’ groups. It may be appropriate to manage access so as to reduce disturbance, through the creation of ‘desire lines’ and the careful siting of gates and signage to create a visible route. In some cases, alternative access provision on less sensitive sites nearby might be feasible.
- Restoring and enhancing unimproved acid grasslands in parklands, on commons and on golf courses. Maintaining localised bare sand habitats on the Greensand ridge that support nationally rare wildlife species, to further protect and enhance biodiversity, while benefiting the sense of place and history.

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**SEO 2: Protect, manage and significantly enhance the mosaic and connectivity of semi-natural habitats within the mixed farmed landscape – particularly the internationally important woodland and heathland habitats – for the benefit of biodiversity, pollination, soil and water regulation, landscape character and enhanced adaptation to climate change.**

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- Improving the ecological connectivity of woodlands, heathlands, copses, grasslands, road verges, hedgerows and wetlands, strengthening the overall network of habitats, reducing fragmentation and improving the permeability of the landscape for species movement. This ecological connectivity should extend out from the NCA and link with adjoining areas, creating a coherent suite of quality habitats.
- Creating a mosaic of semi-natural woodland, grassland and wetland habitats that assimilate disused mineral workings and landfill sites into the landscape, while providing new wildlife havens and recreational space.

**SEO 3: Manage and significantly enhance the quality of the characteristic wetland and water environment of the Greensand. This will contribute to sustainable flood risk management, will benefit the regulation of water quality and water availability, as well as enhancing the sense of place, biodiversity, recreation and wetland habitat adaptation to climate change.**

**For example, by:**

- Restoring, expanding and re-connecting important wetland habitats within flood plains (particularly of the Arun – including Amberley Wildbrooks – the Western Rother, flood plain grazing marsh, wet lowland meadows, reedbeds, lowland fens and wet woodlands of willow and alder), to improve adaptation to climate change, enhance biodiversity and landscape character, while improving water quality and water storage, for the benefit of flood alleviation and aquifer recharge.
- Restoring natural river geomorphology where this is viable and where it is of particular benefit to biodiversity, including to fish populations. Bringing rivers back into continuity with their flood plains, and re-establishing backwaters as a refuge for aquatic species in times of drought. Allowing the seasonal inundation of wetlands and flood plain pastures as part of flood alleviation measures. This reflects the policies of the Catchment Flood Management Plans, as well as being essential to sustaining wetland habitats.
- Creating and maintaining low-input grasslands in river valleys and where this can bring significant benefits for water quality, along with low-input grasslands and wide grass buffer strips on sandy soils that are susceptible to erosion. Locating buffer strips to run across slopes and on either side of watercourses, to intercept sediment and associated nutrients – particularly within the Defra priority catchments of both the East Stour and the Arun and Western Rother, and the valleys of both the Medway and Wey – to aid improvements in water quality. Encouraging good soil management, including increasing organic matter content to enhance the structural condition of the soil, and improving water-holding capacity and water infiltration to aid aquifer recharge.
- Maintaining and restoring the numerous manmade lakes and ponds for the benefit of biodiversity, the landscape, the historic environment and water storage, to reduce runoff and soil erosion.
- Maintaining areas of tranquillity within the river valleys; deeply tranquil areas are still present, particularly in the extensive wetland areas of Amberley Wildbrooks, in the west.
- Ensuring that the ditch systems and wet grasslands (which support a rich ditch flora and attract nationally important populations of winter birds) are appropriately managed to maintain their biodiversity value as core sites.
- Conserving the historic bridges and heritage features of the flood plain landscapes, benefiting the sense of place and history.
- Enhancing the recreational assets of the wetland environment, including its aesthetic qualities, any water-based activities, and walking and cycling routes along the river corridors. This will provide benefits for local communities and tourists as local access networks are maintained and enhanced, while also benefiting health and wellbeing.
- Encouraging sustainable water use – both within and outside the boundaries of the NCA, and across sectors – to protect the sandstone aquifer from over-abstraction and to mitigate the negative impacts of low river flows on biodiversity (particularly on the internationally important wetland and heathland sites), while improving resilience to climate change.

**SEO 4: Plan to deliver a network of integrated, well managed green spaces in existing and developing urban areas, providing social, economic and environmental benefits, and reinforcing landscape character and local distinctiveness – particularly on or alongside the boundaries of the designated landscapes within the Wealden Greensand.**

**For example, by:**

- Where appropriate, creating areas of broadleaved woodland (under coppice management where possible) around towns to provide a buffer to new development. Providing local recreational opportunities that divert pressures from the SPA and SAC designated areas of heath, helping to provide climate change adaptation, flood alleviation, enhanced landscape character and biodiversity benefits.
- Creating enhanced areas of new – and improving any existing – multifunctional natural green space, including community food gardens, orchards, and extensive wetlands that form part of sustainable urban drainage systems. These link into the heart of urban areas and provide sustainable recreational links into the wider countryside as part of green infrastructure planning. They will help to meet Accessible Natural Greenspace Standards (ANGSt), and ensure that developments retain soil functionality, as much as possible and do not have a negative effect on flood risk within the NCA.
- Ensuring that development and its associated infrastructure (including light, noise and air pollution), does not intrude on the rural landscapes or the special qualities of adjacent protected landscapes (the South Downs National Park, the Kent Downs AONB and the Surrey Hills AONB) conserving remaining areas of tranquillity.
- Promoting the use of sustainable and locally sourced materials, vernacular building techniques and styles, and existing landscape character, to inform design and ensure integration with the surrounding landscape.
- Developing a strategic approach to green infrastructure across the NCA and its boundaries, to take account of the existing urban areas and areas of growth. Planning a network of green spaces across the urban areas, urban fringe and adjacent countryside, which can result in multiple benefits for the environment and communities.

## Supporting document 1: Key facts and data

Area of Wealden Greensand National Character Area (NCA): 145,783 ha

### 1. Landscape and nature conservation designations

The South Downs National Park falls within the NCA (40,751ha). Surrey Hills Area of Outstanding Natural Beauty (AONB) (24,575 ha) and Kent Downs AONB (15,614 ha) also fall within the NCA, in addition to 21 ha of the Dover – Folkestone Heritage Coast.

More information about the protected landscape can be found at:

- [www.southdowns.gov.uk/](http://www.southdowns.gov.uk/)
- [www.kentdowns.org.uk/](http://www.kentdowns.org.uk/)
- [www.surreyhills.org/](http://www.surreyhills.org/)

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	Ramsar	Arun Valley, Thursley and Ockley Bogs	795	1

European	Special Protection Area (SPA)	Wealden Heaths Phase II SPA, Thursley, Hankley and Frensham Commons SPA, Arun Valley SPA	4,454	3
	Special Area of Conservation (SAC)	Thursley, Ash, Pirbright and Chobham SAC, Woolmer Forest SAC, East Hampshire Hangers SAC, Shoreheath Common SAC, Folkestone to Etchinghill Escarpment SAC, Mole Gap to Reigate Escarpment SAC, Rook Clift SAC, The Mens SAC.	3,125	2
National	National Nature Reserve (NNR)	Thursley NNR, Ashford Hangers NNR	413	<1
	Site of Special Scientific Interest (SSSI)	A total of 91 sites wholly or partly within the NCA	9,116	6

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.

There are 548 local sites in the Wealden Greensand NCA covering 10,823 ha which is 7 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	129	1
Favourable	3,551	39
Unfavourable no change	154	2
Unfavourable recovering	5,301	58

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

The highest point within the Wealden Greensand NCA is 294 m above sea level. The lowest point is 0.20 m below sea level. The greensand ridge is highest in the west, becoming lower with a gentler slope towards the east. Leith Hill in Surrey is a notable high point.

Source: Wealden Greensand Natural Area Profile

### 2.2 Landform and process

The Wealden Greensand NCA follows the outcrop of Upper and Lower Greensand which curves around the western end of the Wealden anticline in West Sussex, east Hampshire and Surrey and forms a conspicuous ridge running west to east across Surrey and Kent terminating in coastal cliffs at Folkestone Warren. Time and the elements have removed overlying strata to leave the well defined concentric outcrops that encircle the Low and High Weald. Surface water is a feature across the Greensand with streams and rivers draining off the dip slope. Late Pleistocene landslips, in particular cambering and gullying, are common along inland escarpments and parts of the coast. Most notable is the Folkestone Warren land slip, where massive chalk has slipped on underlying Gault Clay. Here twelve major landslips have occurred since 1765, the most notable being in 1915 when the coastal railway line was displaced.

Source: Wealden Greensand Natural Area Profile, Wealden Greensand Countryside Character Area description

## 2.3 Bedrock geology

The Wealden Greensand NCA is dominated by Lower Cretaceous marine sediments folding into the Weald Anticline by the subsequent Alpine Orogeny. Weald Clay, non-marine fluvial clay borders the Low Weald NCA. The Lower Greensand Group, initially offshore muds, now shales and mudstones, of the Atherfield Clay were deposited followed by shallow marine sands of the Hythe, Sandgate and Folkestone Beds. The Hythe Beds are alternating layers of sandy limestone and calcareous sandstone ('rag and hassock'). The Folkestone Beds are predominantly made up of sandstone deposited in a strongly tidal near shore environment and Gault Clay and Upper Greensand were deposited in a larger and deeper sea; these rocks are of the same age, with the mudstones of the Gault predominant in the east and the sandstones of the Upper Greensand occurring mainly to the west of Sevenoaks. The Gault contains phosphatic nodules in discrete bands and has a rich marine fauna with abundant ammonites, bivalves and gastropods.

Source: Wealden Greensand Natural Area Profile. British Geological Survey maps

## 2.4 Superficial deposits

Superficial deposits, though limited in extent, typically include river gravels and sediments with associated terraces and windblown silts and sand producing loess filling Late Pleistocene gullies.

Source: Wealden Greensand Natural Area Profile British Geological Survey maps

## 2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	14
National	Mixed Interest SSSIs	4
Local	Local Geological Sites	27

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

Soils of the ridges and plateaux are predominantly freely draining slightly acidic droughty sands or coarse loams which are sometimes shallow over soft sandstone or occasionally limestone. There are very acidic sands and loams in the west of the NCA, often associated with heathland habitats, which thrive on these soils. Smaller areas of loamy and clayey soils with impeded or poor drainage occur particularly in the river flood plains and associated with the discontinuous band of lower lying Gault Clay along the outer rim of the NCA.

Source: Wealden Greensand Natural Area Profile

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	1,430	1
Grade 2	21,665	15
Grade 3	57,896	40
Grade 4	20,340	14
Grade 5	654	<1
Non-agricultural	33,067	23
Urban	10,598	7

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.

■ Wey	56 km	■ Medway	13 km
■ Rother	30 km	■ East Stour	8 km
■ Great Stour	30 km	■ Slea	5 km
■ Arun	15 km	■ Mole	4 km
■ Len	14 km	■ Royal Military Canal	4 km

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.**

#### 3.2 Water quality

The total area of Nitrate Vulnerable Zone is 114,922 ha, or 79 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 36,921 ha of woodland, 25 per cent of the total area, of which 10,561 ha is ancient woodland.

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

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

Ancient woodlands have survived throughout the NCA, though often on the steeper slopes and in fragmented patches. Several different types of woodland occur, from the Wealden edge hangers of Hampshire on the steep chalk and Upper Greensand escarpment, to sessile oak woods on the acid, sandy soils of Surrey, West Sussex and Kent. The heavy Gault Clay tends to support pedunculate oak woods with hazel coppice, while the lime rich Kentish ragstone outcrops, such as the Lympe escarpment, support ash woodland. East Surrey and west Kent have distinctive wooded commons or 'charts', which are often ancient in origin and have been used in the past for quarrying stone. In the river valleys and other wetter areas, alder woodland occurs. All these woodland types have their own characteristic fauna and flora and collectively add to the heavily wooded appearance of the Wealden Greensand landscape. The parkland areas contain ancient trees.

Source: Wealden Greensand Natural Area Profile

#### 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	24,943	17
Coniferous	8,647	6
Mixed	1,249	1
Other	2,082	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	7,187	5
Planted Ancient Woodland (PAWS)	3,374	2

Source: Natural England (2004)

## 5. Boundary features and patterns

### 5.1 Boundary features

Field boundaries are often formed by hedgerows with distinct character and species reflecting the soils. On the clay, hedgerows are dense, species rich with occasional standard oaks. On more acidic soils they generally consist of hawthorn and blackthorn, also with occasional oak trees.

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

### 5.2 Field patterns

Most field patterns are the product of ancient enclosure or enclosure by agreement. The small, irregular fields with thick hedgerows and interspersed with small woodlands, characteristic of medieval assarting are dominant in the western part of the area. Medium sized fields, but still having a degree of irregularity, are more common in the valley of the Rother in the south-west and in the central and eastern parts of the area. There is little regular parliamentary type enclosure other than in areas of heathland that were subject to late enclosure.

Source: Countryside Quality Counts Draft Historic profile, Countryside Character Area description; Countryside Quality Counts (2003)

## 6. Agriculture

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

### 6.1 Farm type

From a total of 1,082 in 2009, all livestock farms accounted for 34 per cent of holdings. Arable and horticulture accounted for 27 per cent, of which horticulture represented 12 per cent. Mixed farming accounted for 5 per cent and those classed as 'other types' accounted for 34 per cent. Between 2000 and 2009 the most significant decreases in farm type were horticulture and mixed farms.

Source: Agricultural Census, Defra (2010)

### 6.2 Farm size

Farms between 5 and 20 ha accounted for 35 per cent of the total number at 384 units in 2009, with 205 greater than 100 ha (19 per cent), 209 between 20 and 50 ha (19 per cent), 152 less than 5 ha (14 per cent) and 132 between 50 and 100 ha (12 per cent). The number of farms fell by a hundred between 2000 and 2009, with the greatest loss being those between 20 and 50 ha.

Source: Agricultural Census, Defra (2010)

## 6.3 Farm ownership

2009: Total farm area = 73,706 ha; owned land = 49,104 ha

2000: Total farm area = 73,873 ha; owned land = 49,060 ha

Source: Agricultural Census, Defra (2010)

## 6.4 Land use

Grass and uncropped land represented 52 per cent of the total area in 2009, covering 38,171 ha. Other land uses included cereals covering 21 per cent, (15,438 ha), oilseeds 6 per cent (4,227 ha), other arable crops 6 per cent (4,123 ha) and a small percentage of fruit 2 per cent (1,770 ha).

Source: Agricultural Census, Defra (2010)

## 6.5 Livestock numbers

2009: cattle 28,700, sheep 77,100, pigs 11,000

2000: cattle 39,200, sheep 112,500, pigs 7,600

Source: Agricultural Census, Defra (2010)

## 6.6 Farm labour

2009: salaried managers 214, full time workers 833, part time workers 362, casual/gang 1,474.

2000: salaried managers 243, full time workers 1,330, part time workers 570, casual/gang 2,015.

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.**

## 7. Key habitats and species

### 7.1 Habitat distribution/coverage

Important semi-natural habitats include lowland heath, extensive ancient woodland, pasture, ponds and wetlands. Lowland heath was once very extensive on the Greensand ridge but today heathland is concentrated in West Sussex (around Midhurst), Hampshire (Woolmer Forest) and western Surrey (Thursley). Many ancient woodlands have survived throughout the NCA. The NCA includes part of several river valleys, notably the Arun, the Rother and the Wey. These support a series of wetland habitats including alluvial grazing meadows with drainage ditches, marshy grassland, reedbeds and wet woodlands. Other habitats include dry acidic grassland which is mostly found in commons, parkland and patches within heathland. There are also unimproved pastures on less acidic soils in Kent. Ponds are another notable habitat, including hammer ponds in Hampshire, West Sussex and Surrey and numerous small farm ponds. The Greensand ridge meets the coast of Kent between Folkestone Warren and Hythe, the undeveloped sea cliffs provide an important geological exposure and habitats.

Source: Wealden Greensand 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)	15,728	11
Fens	2,959	2
Lowland heathland	2,567	2
Coastal and flood plain grazing marsh	1,298	1
Reedbeds	264	<1
Lowland dry acid grassland	212	<1
Lowland meadows	210	<1
Lowland calcareous grassland	144	<1
Purple moor grass and rush pasture	29	<1
Mudflats	21	<1
Maritime cliff and slope	12	<1

Source: Natural England (2011)

### 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

Settlement across the character area is a mixture of both dispersed farmsteads and hamlets and some nucleated villages, often linked by small, deeply sunken lanes. The south-western part of the area remains essentially rural, with smaller market towns, but eastwards from Dorking the character area is considerably more urbanised. The area forms a transport corridor with the M25, M20 and M26 running along and across the area. Improved transport links from the later 19th century led to increased development of this part of the character area as it became a commuter belt. Within the area there are many large houses set in landscaped parks or large gardens.

Source: Countryside Quality Counts draft historic profile, Wealden Greensands Countryside Character Area description; Countryside Quality Counts (2003)

### 8.2 Main settlements

The main settlements within the Wealden Greensand NCA are: Maidstone, Redhill, Dorking, Ashford, Sevenoaks and Reigate. The total estimated population for this NCA (derived from ONS 2001 census data) is: 620,911.

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

### 8.3 Local vernacular and building materials

The use of greensand, ragstone and, in the west, malmstone, a soft creamy coloured stone, give the buildings of the area a distinctive character. In Surrey in particular galleting, the insertion of small pieces of dark carstone in the mortar between the stonework, is characteristic. Timber-framing was also a traditional building form that was largely superseded by brick by the 18th century except for farm buildings where it continued in use into the 19th century. There is a high survival of timber-frame buildings dating from the 15th and 16th centuries including Wealden hall houses. Clay tile roofs are characteristic, as is the use of tile hanging on walls.

Source: Countryside Quality Counts, Draft Historic profile, Wealden Greensands Countryside Character Area description; Countryside Quality Counts (2003)

## 9. Key historic sites and features

### 9.1 Origin of historic features

The history of this landscape is evident in the predominantly irregular-patterned fields and the ancient road network, including winding sunken lanes and Roman roads, as well as tumuli from the Bronze Age near Petersfield and on the higher ground of heathlands in Sussex, Iron-age hillforts at Holmbury, Anstiebury and Oldbury Hill, and Neolithic remains at Abinger. There are numerous large house and designed parklands, including Petworth in Sussex, Knole, Squerries Court and Leeds Castle in Kent. Hammer ponds associated with iron working are also found. A series of historic bridges are found over the River Wey associated with the remnant water meadow system.

Source: Countryside Quality Counts Draft Historic Profile, Countryside Character Area description

### 9.2 Designated historic assets

This NCA has the following historic designations:

- 45 Registered Parks and Gardens covering 3,622 ha
- 0 Registered Battlefields
- 283 Scheduled Monuments
- 8,000 Listed Buildings

Source: Natural England (2010)

- 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

- Nine per cent of the NCA, 12,744 ha, is classified as being publically accessible.
- There are 3,315 km of public rights of way at a density of 2.3 km per km<sup>2</sup>.
- There are 2 national trails; North Downs Way 22 km, South Downs Way 23 km).

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)	2,787	2
Common Land	6,406	4
Country Parks	474	<1
CROW Access Land (Section 4 and 16)	8,118	6
CROW Section 15	5,387	4
Village Greens	125	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	5,067	3
Local Nature Reserves (LNRs)	808	1
Millennium Greens	3	<1
Accessible National Nature Reserves (NNRs)	434	<1
Agri-environment Scheme Access	91	<1
Woods for People	7,187	5

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

Based on the CPRE map of tranquillity (2006) tranquillity is most associated with the intimate rural landscape of the south-west, with only pockets of tranquil areas found in the more developed eastern and central parts of the NCA. The lowest scores for tranquillity are found around Ashford, Maidstone, Sevenoaks, Redhill, at the coast and along main roads (M20, M25).

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

Category of tranquillity	Score
Highest value within NCA	51
Lowest value within NCA	-88
Mean value within NCA	-10

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. This shows that disturbed areas in the NCA coincide with several major roads, notably the M20, M25 and A3. The NCA skirts south London and in the main has very few undisturbed areas and these tend to be in the south-west of the NCA.

A breakdown of intrusion values for this NCA is detailed in the table below.

Category of intrusion	1960s (%)	1990s (%)	2007 (%)	% change (1960s-2007)
Disturbed	32	59	63	31
Undisturbed	63	36	27	-36
Urban	5	5	10	5

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are that 27 per cent of the NCA is classified as undisturbed a decline from over 60 per cent in the 1960s. The amount of disturbed land is now equal to the amount of undisturbed land in the 1960s.

- More information is available at the following address:  
<http://www.cpre.org.uk/campaigns/planning/intrusion/our-intrusion-map-explained>



Priory lane at Selborne.

## 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

- Countryside Quality Counts research<sup>9</sup> indicated that the coverage of Woodland Grant Scheme for management of established woodland and ancient woodland was considered high, with some attention to restocking and coppice felling with an overall increase in coverage from 24 per cent to 28 per cent between 1999 and 2003.
- Invasive species continue to threaten the woodlands including rhododendron and laurel which thrive on acidic sandy soils within woodlands. Tree diseases more recently identified include *Chalara fraxinea* and *Phytophthora ramorum*.
- Management has tended to concentrate on coniferous rotations in the west rather than traditional management of deciduous woodlands, where much potential is still to be realised.
- The 1987 storm had significant impacts on the more exposed faces of the Greensand, with some major wind blow areas such as those around Leith Hill. These areas have now regenerated.
- In the past some coniferous plantations were reverted to heathland in response to a drive to restore and link degraded heathland habitats. Agri-environment schemes provided the mechanism for some larger scale

heathland restoration in the early years of schemes. However, after initial activity the larger scale reversion of coniferous plantations has generally declined but with some targeted conifer removal still ongoing.

- A steady resurgence in the appreciation for the value of wood as both a carbon lean building material and fuel suggests a steady restoration of active management to many woods within the NCA over the next decade. Greater understanding of the multifunctional values of woodland habitats and sustainable woodland management techniques (as defined by the UK Forestry Standard) is likely to result in a more resilient and integrated landscape character.
- Similarly market opportunities for all forms of biomass are likely to provide economic drivers to help maintain heathland habitats.

#### Boundary features

- The estimated boundary length of this NCA is about 8,769 km. According to Countryside Quality Counts research boundary features were considered neglected during the period 1999 to 2003, with just 4 per cent of the resource covered by an agri-environment scheme. The introduction of Environmental Stewardship in 2005 has led to a significant increase in the length of boundary features under positive environmental management with 860 km, nearly 10 per cent of estimated boundary length, within an Environmental Stewardship Scheme. Despite this, some hedgerows have developed gaps, become overgrown or been lost with corresponding impacts on local landscape character.

<sup>9</sup> Countryside Quality Counts: <http://webarchive.nationalarchives.gov.uk/20101219012433/countryside-quality-counts.org.uk/>

- In some parts of the NCA, particularly in Surrey and west Sussex, horse paddocks and associated fence lines have become more prominent in the urban fringe.
- Sunken tracks are a very distinctive feature in the west of the NCA, often associated with historic boundaries. Increased numbers of vehicles has resulted in the widening of these tracks and in some instances changed the character of what would have been narrow single track roads.

## Agriculture

- Agricultural land comprises a mosaic of mixed farming with pasture and arable land, and with a fruit growing belt in Kent and locally around Selborne in Hampshire.
- Recent data from the Agricultural Census has indicated that between 2000 and 2009 the most significant decreases in farm type were horticulture and mixed farms. Dairy farms have also reduced in number. The Agricultural Census data also indicated livestock farms (52 per cent of total area) were the most prevalent farm type in 2009, these figures are supported by the area classified as grass and uncropped land. The remaining land use was made up of cereals, oilseeds, other arable crops and a small percentage of fruit (2 per cent). It appears as though this balance has been broadly maintained in more recent years.
- The use of land for recreational purposes as opposed to agriculture, particularly in areas close to urban centres has led to deterioration in farmed character in response to increased pressure for more recreational land uses.
- In the last 10 years there have been increased opportunities through agri-environment schemes to integrate a range of conservation measures into the farmed landscape. These have included management of fragments of acid grassland, heathlands, commons and flood plain grasslands.

## Settlement and development

- Countryside Quality Counts research suggested that between 1999 and 2003 development continued to significantly transform the character of some parts of the NCA with most development concentrated in the east, especially between Sevenoaks and Maidstone.
- Degradation of the urban fringe landscape notably in the east and a change in the character associated with small holdings, particularly within parts of the central area of the NCA are notable.
- Enhancement of transport networks has had a significant impact, notably the high speed Channel Tunnel Rail Link and major road networks.
- Pressure for development sites will continue within the NCA, most likely in the central and eastern areas around existing urban centres, but also at Petersfield and Bordon in the west. Bordon has been identified as an eco-town. Eco-towns are intended to achieve sustainable development in conjunction with affordable housing.

## Semi-natural habitat

- Despite efforts to improve the quality of semi-natural habitats across the NCA and the progress that has been achieved through landscape scale projects and agri-environment schemes, much work still needs to be done to strengthen the connectivity and quality of habitats and to reduce further fragmentation in response to the threats to biodiversity from invasive species, climate change and development.
- Fifty-eight per cent of SSSI are in 'unfavourable recovering' condition and 39 per cent are classed as in 'favourable' condition; the ongoing condition of these sites will be dependent on long term management and monitoring.

- Work has been undertaken in recent years to improve the quality of heathland habitats and agri-environment scheme funding has provided a mechanism for this. However, invasion by scrub and bracken on heathlands where there is low grazing pressure continues to be an issue.
- The Hindhead Tunnel, along the A3, was completed in 2011. This has led to landscape and biodiversity benefits. Two large areas of heathland have been linked and woodland creation has occurred on the route of the old road.
- The outputs from the Assessing Regional Habitat Change (ARCH) project should be used for a review of the habitats in Kent and the most recent habitat data and trends. Currently this information is only available for Kent and does not include areas of the NCA that fall into Surrey, Sussex or Hampshire<sup>10</sup>.

## Historic features

- Historic sites within the NCA are identified on the Heritage at Risk Register, with neglect, decay or inappropriate change<sup>11</sup> (8000 listed buildings and 283 scheduled monuments fall within the NCA). However, in the last decade agri-environment schemes have been targeted at these sites and as a result some sites have been successfully removed from the list.
- Historic parkland is a feature of the area and there are 45 registered parks and gardens within the NCA. In 1995 it was estimated that 51 per cent of historic parkland had been lost within the NCA. However, in terms of remaining parkland, CQC research in 2003 indicated that about 35 per

cent was covered by an historic parkland grant and about 34 per cent was included within an agri-environmental scheme. Since the launch of Environmental Stewardship in 2005 parkland options and standard capital items have been targeted at historic features and include the restoration and maintenance of parkland including the restoration of parkland structures such as parkland railing and buildings.

- The Photo Image Project (2006) recorded a high proportion of listed working farm buildings converted to non-agricultural use in this NCA; 56 per cent, the national average being 32 per cent<sup>12</sup>.

## Coast and rivers

- The coastline is undergoing constant change and there has been substantial development along the coastline. Along the frontage groynes have been constructed to retain sand and shingle that would have naturally been carried eastwards. The implementation of various defence schemes and management practices has led to a progressive denudation of sediment along the coastline causing narrowing and steepening of the foreshore. The legacy of the defence structures throughout this frontage means that apart from a small area there is very little natural evolution of the coast as a means of managing the shoreline.
- The ecological status of waterbodies is now monitored under the Water Framework Directive (WFD). River basin management plans cover the rivers and coast of the NCA setting out the main issues and what actions need to be taken to deal with them. This change in approach is driving actions within catchments, including the establishment of catchment partnerships and the move towards a catchment based approach.

<sup>10</sup> For more information on the ARCH project, see: [www.archnature.eu](http://www.archnature.eu)

<sup>11</sup> For more information on the Heritage at Risk register, see: [www.english-heritage.org.uk/caring/heritage-at-risk](http://www.english-heritage.org.uk/caring/heritage-at-risk)

<sup>12</sup> *Draft Farmsteads Character Statement – Wealden Greensand*, English Heritage (2006)

- There are three Catchment Sensitive Farming (CSF) areas within the NCA (Medway and Eden, Stour and the Arun and Western Rother). The aim of CSF is to provide practical solutions and targeted support to enable farmers and land managers to reduce diffuse water pollution from agriculture. Recent change as a result of this initiative is difficult to quantify due to the time lag before observable improvements can be considered statistically significant. However, water quality is monitored across a range of representative catchments and the results confirm reductions in pollutant loads and concentrations resulting from the CSF initiative<sup>13</sup>.

## Minerals

- The underlying geology of the NCA is of economic value and this is compounded by the number of active and disused quarries. There have been proposals for soft sand, crushed rock and silica sand sites within the NCA, within the various County Minerals and Waste Plans.
- Kentish ragstone continues to be quarried, but only at two sites in Kent (both within the NCA) and is an important resource, particularly for restoration of historic buildings. However, at current rates, existing supplies will become exhausted and new reserves may need to be identified.
- Where well managed, quarries, during and after their use, can be important ecological and geological sites.

<sup>13</sup> <http://www.naturalengland.org.uk/ourwork/farming/csf/evaluation.aspx>

<sup>14</sup> For more information on Natural England's Character Area Climate Change Project, see [www.naturalengland.org.uk/ourwork/climateandenergy/climatechange/adaptation/naturalengland.aspx](http://www.naturalengland.org.uk/ourwork/climateandenergy/climatechange/adaptation/naturalengland.aspx)

## Drivers of change

### Climate change

Potential impacts include:

- Change in woodland composition as a result of hotter, drier summers and new tree diseases, with competition from invasive species and notably loss of beech as a result of dieback due to soil moisture stress and wind blow due to increased storminess<sup>14</sup> – this has significant implications for the internationally important East Hampshire Hangers SAC in the west.
- Effects of hotter, drier summers on remnant areas of lowland heath, including changes in community composition, with a potential increase in perennial grasses, and birch at the expense of heather, potential reduced growth during summer months, and increased risk of wild fires as a result of increased temperatures.
- There may be a deterioration in wetland habitats due to summer drought, affecting wet woodland, fens, reedbeds, grazing marsh and wet meadows.
- If winters become wetter and summers drier, this could result in flooding and drought, potentially impacting on the flow regimes of the area's watercourses.
- Effects on orchards, including potential tree or crop loss due to drought stress, waterlogged soils and wind throw.
- Accelerated erosion of coastal cliffs.
- Longer growing seasons and different crop timings could result in the introduction of novel crops with appearance of species and crops adapted to new climatic conditions, with a longer growing season potentially leading to double cropping.

- Flood risk is likely to increase as climate change increases the magnitude and frequency of flood events.
- Pressure upon the water supply due to summer drought exacerbated by increased demand for abstraction.
- Changes in climate may result in species movements including the return of native species, expansion in the range of some species from continental Europe and some northward migration of indigenous species.
- New housing may place additional demands on water resources of the NCA, particularly the aquifers. If not managed appropriately this could significantly affect the natural springs, wet marshes and heathland habitats with knock on effects for protected sites and species.
- There is likely to be continued demand for sand, sandstone and ragstone, this may result in applications for new quarries. Opportunities for restoration of disused quarries should be sought, to maximise their geological, environmental and amenity potential. There may also be a drive to safeguard the mineral resource of the NCA, protecting supplies for future generations.

## Other key drivers

- Development pressures offer a challenge but where permitted it will be important to maximise opportunities for landscape and ecological enhancements through delivery of priority habitats and greenspace. Well planned green infrastructure within and reaching out from urban areas can help mitigate climate change and provide other environmental, economic and societal benefits.
- Increased development may cause associated urban fringe and suburban pressures including recreational activities on sensitive and vulnerable sites and habitats. An integrated approach to recreation management will be required especially to mitigate threats to key biodiversity sites including European sites. In addition, increased pressure for recreational facilities such as golf courses and horse riding centres, while servicing demand may impact on the rural character of the landscape particularly, in the west.
- New export markets, changing climate and increased pressure for food production in the future, as a result of a national drive for greater self-sufficiency in food is likely to have an effect on existing agricultural practices and land use.
- A requirement for increasing renewable energy generation could result in pressure for wind farm developments and increased pressure for the growth of biomass crops (Defra's maps show predominantly high potential miscanthus yields and medium potential SRC yields throughout the area).
- Delivery of flood risk management options as set out in the Rother, Wey, Mole, Arun, Stour and Medway catchment flood management plans should help to reduce flood risk.
- Working at a landscape scale can help to establish a coherent and resilient ecological network, capable of adapting to environmental change and halting losses in biodiversity. Increasing focus on connectivity and resilience

is likely to inform landscape scale projects throughout the NCA and could be used to drive improvements in quality and extent of semi-natural habitats.

- There is likely to be sustained pressure from tourism, especially to the protected landscapes of the South Downs National Park, Surrey Hills AONB and Kent Downs AONB. There will need to be a balance between maximising income from tourism and protecting the natural assets of the NCA.
- Future water resource issues are likely to have an impact on the NCA. The Greensand aquifer is an important source of water and is likely to come under increasing pressure. It will be important to work in partnership and across sectors to help safeguard the water resources. Implementation of the Water Framework Directive should improve the ecological status or potential of the NCA's rivers and quality of groundwater.
- The economics of woodland and heathland management, including the establishment of markets for wood fuel, high quality timber and heathland products is likely to be critical for securing the longer term sustainable management of the woodland and heathland resource.
- The Ministry of Defence are key landowners within the NCA and there may be increasing pressure to make use of the military training estate. This could have implications for habitats, tranquillity and public accessibility.



Ashford Hangers National Nature Reserve.

## 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.



Silver-studded blue butterfly.

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
<p><b>SEO 1:</b> Protect and manage the nationally recognised and distinctive character of the landscape, conserving and enhancing historic landscape character, tranquillity, sense of place, and the rich historical and geological heritage of the Wealden Greensand. Enhance access provision where appropriate, to maintain public benefit from enjoyment of the area.</p>	○	↗*	↗*	↔*	↗*	○	↔*	↔*	↔*	↔*	↔*	○	↗*	↑***	↑***	↑**	↑***	↗*	↑***
<p><b>SEO 2:</b> Protect, manage and significantly enhance the mosaic and connectivity of semi-natural habitats within the mixed farmed landscape - particularly the internationally important woodland and heathland habitats - for the benefit of biodiversity, pollination, soil and water regulation, landscape character and enhanced adaptation to climate change.</p>	○	↑**	↗*	↗*	↗**	↗*	↗**	↗**	↗***	↗*	↗*	↔**	↑*	↑*	↑*	↗*	↗***	↗*	

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	Tranquility	Recreation	Biodiversity	Geodiversity
<p><b>SEO 3:</b> Manage and significantly enhance the quality of the characteristic wetland and water environment of the Greensand. This will contribute to sustainable flood risk management, will benefit the regulation of water quality and water availability, as well as enhancing the sense of place, biodiversity, recreation and wetland habitat adaptation to climate change.</p>	○	↔ ***	↑ **	↔ *	↔ *	↗ **	↑ **	↑ **	↔ *	↗ **	○ ***	○ ***	↔ *	↗ **	↗ *	↗ *	↗ *	↑ **	↔ *
<p><b>SEO 4:</b> Plan to deliver a network of integrated, well managed green spaces in existing and developing urban areas, providing social, economic and environmental benefits, and reinforcing landscape character and local distinctiveness, - particularly on or alongside the boundaries of the designated landscapes within the Wealden Greensand.</p>	↔ *	↗ *	↔ *	↗ *	↗ *	↔ *	↗ *	↔ *	↔ *	↔ *	↔ *	↔ *	↔ *	↗ *	↗ *	↔ *	↗ **	↗ *	↔ *

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
<p>A long, narrow belt of Greensand typified by scarp/dip slope topography, with dissecting river valleys.</p>	<ul style="list-style-type: none"> <li>■ The Greensand ridge is a conspicuous feature running west-east across the south-east and defines the NCA. The highest point in Surrey is found at Leith Hill.</li> <li>■ Long-reaching views are afforded over the adjacent Low Weald, South Downs and London from the prominent scarp summits.</li> <li>■ The topography contributes to the intimate character of the landscape, particularly in the west.</li> </ul>
<p>A complex geology of Upper Greensand, Gault Clay and Lower Greensand, including geological exposures in quarries.</p>	<ul style="list-style-type: none"> <li>■ The complex geology contributes to the diversity of landscape character and land use.</li> <li>■ Important geological exposures dominated by the Lower Greensand, including undeveloped sea cliffs between Folkestone Warren and Hythe, plus inland exposures of Upper Greensand in Hampshire and west Sussex and the ragstone exposures of the Lympe Escarpment in Kent, all supporting important wildlife communities including diverse moss and liverwort flora.</li> <li>■ Quarries are occasionally striking elements in the landscape, providing geological exposures to facilitate further understanding of the Greensand ridge and our understanding of past climate change. The economic value of the underlying geology is evident in the large number of quarries across the NCA.</li> <li>■ Geological exposures within quarries are also important as hibernation sites for bats, including Natterer's, Daubenton's and brown long eared bats.</li> <li>■ Well planned restoration of former extraction sites and appropriate management of existing sites provides an opportunity for positive landscape and environmental change.</li> </ul>
<p>Extensive belts of ancient mixed woodland of hazel, oak, beech and birch and chestnut coppice reflecting the diverse geology, surviving mainly on river valley floors and steep scarp slopes, including areas of international importance.</p>	<ul style="list-style-type: none"> <li>■ East Hampshire Hangers SAC are highly distinctive localised landscape features and internationally important for wildlife; these cloak the steep chalk and upper Greensand escarpment in Hampshire and support yew and beech woodland of international importance.</li> <li>■ East Surrey and west Kent have distinctive wooded commons or charts, many of them ancient.</li> <li>■ Many ancient woodlands have suffered from inappropriate management, including planting with conifers.</li> <li>■ Many of the NCAs woodlands are important for their assemblages of vascular plants, birds, invertebrates and bryophytes, as well as supporting ground flora species which are indicative of ancient woodland.</li> <li>■ Conifer woodlands, including large commercial estates are also a strong element of the landscape, with extracted timber used locally for building timber and fence posts.</li> </ul>

Landscape attribute	Justification for selection
<p>Remnant lowland heathland mostly concentrated in west Sussex, Hampshire and west Surrey. Heathland habitats include dry and wet heath, acid grassland, scrub, woodland, bog and open water.</p>	<ul style="list-style-type: none"> <li>■ Heathland is a visually prominent feature of the Greensand, contrasting with other land uses and bringing a diversity of colour, textures and sounds to the NCA.</li> <li>■ Lowland heathland was once extensive across the ridge but there has been a dramatic decline in habitat over the past century, with much former heath now covered by secondary woodland. Remaining areas are mostly concentrated in west Sussex, Hampshire and west Surrey, although Hothfield Heathlands contain Kent's last valley bogs and one of its few remaining fragments of open heath. Heathland is now a nationally and internationally rare and threatened habitat.</li> <li>■ Heathland developed on sandy and acidic soils which were maintained as open and grazed landscapes since at least the Bronze Age, when much of the original woodland cover was cleared by early man for agriculture, and are part of the NCAs cultural heritage.</li> <li>■ Internationally important areas still survive displaying the full range of habitats, including over 2,500 ha with SAC designation and over 3,000 ha with SPA designation. Woolmer Forest is noted as containing the largest diverse area of lowland heathland in Hampshire outside of the New Forest.</li> <li>■ Open heathland commons continue to be compromised by encroaching birch, oak and pine scrub, due to a decline in traditional management regimes.</li> <li>■ Heathland supports a number of rare species, including birds such as the Dartford warbler, nightjar, stonechat and woodlark. They also support, amphibians and reptiles including, adder and common lizard, and butterflies such as the silver studded blue, small copper and green hairstreaks. Spiders and their webs also adorn the heathland habitats including the bog raft spider.</li> </ul>
<p>Coastal habitats and sea cliffs.</p>	<ul style="list-style-type: none"> <li>■ The Greensand ridge meets the coast of Kent between Folkestone Warren and Hythe. While most of the coastal strip is now built up, the undeveloped sea cliffs provide an important geological exposure. They support some scrub and acid grassland habitats and are extremely important for insect fauna.</li> <li>■ Part of the coastline falls into the Dover-Folkestone Heritage Coast.</li> <li>■ The coastline will continue to be affected by sea level rise, with coastal squeeze an issue along the defended coastline.</li> </ul>

Landscape attribute	Justification for selection
<p>The area's rivers and streams and their associated wetland habitats, including the Arun/Western Rother, the Wey, Mole, the Medway and Stour. Ponds and lakes are also a feature found throughout.</p>	<ul style="list-style-type: none"> <li>■ Surface water is an important feature on the Greensand, with rivers and streams draining off the dip slope.</li> <li>■ Wetland habitats, most notably associated with the rivers Arun, Western Rother and Wey, include alluvial grazing meadows with drainage ditches, marshy grassland, reedbeds and wet woodland of high biodiversity value. Otters have recently been recorded on the river Wey.</li> <li>■ The special and evocative species, such as the Bewick's swan and ruff, ramshorn snail, wetland invertebrates and nationally rare and nationally scarce plant species found within the Arun Valley are recognised as being of international importance protected by SAC, SPA and Ramsar designations.</li> <li>■ Flood plain grasslands, marshes, ponds and lakes support a number of species including, cut grass, true fox sedge and marsh stitchwort.</li> <li>■ Large parts of the fertile river flood plains have been agriculturally improved and drained which has resulted in a general degradation of major river flood plain landscapes.</li> <li>■ Ponds and lakes are a characteristic feature, including hammer ponds in Hampshire, west Sussex and Surrey associated with the early iron industry, acid pools and ponds derived from peat cutting on heathlands, manmade lakes in parklands and numerous small farm ponds particularly on the Gault Clay. Many of these waterbodies are rich in wildlife habitats and important for plants and inverts.</li> <li>■ The rivers are important for recreation, providing opportunities for walking and angling as well as some water based activities including boating and canoeing. The Wey and Medway navigations are not only important for recreation and tourism but they also provide important links to the local industrial heritage.</li> <li>■ The River Wey has a remnant water meadow system with associated historic bridges, now designated as scheduled monuments.</li> </ul>
<p>Unimproved acid grasslands found in commons, parkland, and as patches within heathland and golf courses, plus other unimproved areas of pasture and occasional areas of acid bog.</p>	<ul style="list-style-type: none"> <li>■ The band of Gault Clay at the foot of the North Downs in Kent would once have supported a large number of small, unimproved pastures on less acidic soils, a few of which remain at sites, such as Trottiscliffe Meadows SSSI.</li> <li>■ Most of the acid grasslands are found in commons, parklands, patches within heathland and along road verges. There has been a loss of unimproved grasslands where agricultural improvement has taken place.</li> <li>■ Unimproved grasslands are scarce and fragmented.</li> </ul>

Landscape attribute	Justification for selection
<p>Irregular field patterns predominate, with small fields dominant in the west and medium-sized fields more common in the Rother Valley and central and eastern parts; hedgerows and shaws form characteristic boundaries.</p>	<ul style="list-style-type: none"> <li>■ Irregular field patterns are characteristic of the NCA and reflect historical enclosure.</li> <li>■ On the Gault Clay, hedgerows are species-rich with occasional oak trees. Hedgerows on acidic soils have fewer species and are sometimes gappy, with urban fringe pressures contributing to their decline;</li> <li>■ Boundary features in the form of shaws and hedgerows are important as wildlife refuges and corridors within the farmed landscape, supporting wildlife such as dormice.</li> </ul>
<p>Agricultural land comprises a mosaic of mixed farming, with pasture and arable land, set within a wooded framework, with a fruit growing orchard belt persisting in Kent.</p>	<ul style="list-style-type: none"> <li>■ The diversity of agriculture reflects the underlying geology and contributes to the NCA's character.</li> <li>■ Distinctive hop fields and orchards were once a familiar feature along the Greensand but have been extensively replaced by arable production. Many orchards and plats have been grubbed out and replaced by arable fields or more intensive types of fruit production.</li> <li>■ There are a cluster of cobnut plats, particularly around Plaxtol in Kent. These are valued for their historical, cultural, wildlife and landscape value, and are thought to include one of the largest single blocks of old cobnut plat remaining in the UK. The last functioning hop garden in Surrey is found in the Wealden Greensand NCA.</li> <li>■ Arable land provides foraging and overwintering sites for a range of farmland bird species.</li> </ul>
<p>Rural settlement pattern is a mixture of both dispersed farmsteads and hamlets and some nucleated villages. Historic buildings including oast houses and timber-frame buildings dating from the 15th and 16th centuries. Distinctive sunken lanes cut into the sandstone connecting farmsteads and settlements.</p>	<ul style="list-style-type: none"> <li>■ Modern development now dominates the eastern half of the NCA, while the south-west still remains essentially rural.</li> <li>■ Oast houses are a highly characteristic farm building type (associated with the hop industry), especially in the north and west Kent but are also found in the Hampshire, part of the NCA. Oasts are rare in the southern part of the area. Most Kentish examples date from the late 18th and 19th centuries, although there are some examples of older oast houses built within earlier barns. The majority of Hampshire oasts are of late 19th century date. Only a small number of unconverted oast houses survive. Farmsteads that retain unconverted oast houses, early to mid-20th century hop buildings and features such as hop-pickers huts are highly significant.</li> <li>■ Sunken lanes are historic and characteristic features of the landscape but are at risk from road improvements leading to the erosion of the enclosed and winding character of the local road network. As well as being of historic interest they are important for exposures of the underlying bedrock geology and biodiversity, often home to ancient trees.</li> </ul>

Landscape attribute	Justification for selection
<p>Local vernacular including the use of Greensand, ragstone and, in the west, malmstone, bargate stone, plus dark carrstone patterned in the mortar between stones ('galleting') in Surrey, and timber-framing and weatherboarding.</p>	<ul style="list-style-type: none"> <li>■ The use of local sandstone reflects the underlying geology. In the west, Malmstone, a soft creamy coloured Greensand has historically been widely used and harder, darker ragstone is still used in the central and eastern parts of the character area. The use of stone gives the buildings of the area a distinctive character, especially when entering the area from the west, where across most of Hampshire there is no local building stone.</li> <li>■ There is no direct alternative for Malmstone, and no local quarries in operation to provide material for repairs.</li> </ul>
<p>Numerous historic parklands, including Petworth in Sussex, Knole, Squerries Court and Leeds Castle in Kent.</p>	<ul style="list-style-type: none"> <li>■ Many parklands contain distinctive ancient pollards, which provide important wildlife habitats, along with unimproved grassland. Acid grassland within parklands is also important, where it remains unimproved it is maintained by light grazing.</li> <li>■ Lack of appropriate management can be an issue, and a number of parklands are in need of ongoing restoration. The ancient pollard trees need to be re-cut to prevent them becoming top-heavy and appropriate replacements planted. Where traditional management has declined, the habitats that these parklands sustained have become fragmented.</li> <li>■ Fungi and lichens often abound in old parkland both on below and among the veteran trees.</li> </ul>
<p>Other historic features including Palaeolithic remains, bronze-age barrows and iron-age hillforts on the scarp tops, plus small quarries, military remains, Abbeys, castles, historic bridges over the River Wey and relics of the iron industry including hammer ponds and the former royal hunting forest at Woolmer.</p>	<ul style="list-style-type: none"> <li>■ A number of historic features including 283 scheduled monuments.</li> <li>■ Prehistoric scarp-top features are closely associated with the Pilgrim's Way, which runs in parallel along the adjacent North Downs;</li> <li>■ Bronze-age barrows provide a link to a prehistoric ritual landscape.</li> <li>■ Hammer ponds, notably in the west, provide important wildlife habitats and links to the NCA's industrial past and geodiversity.</li> <li>■ A series of historic bridges over the River Wey are designated as scheduled ancient monuments are of great historic significance.</li> <li>■ Military features associated with the coast are notable in the east and include the Royal Military Canal.</li> <li>■ The monastery at Waverley Abbey was the first Cistercian house to be established in Britain.</li> <li>■ Historic features provide opportunities for education and research and are important links to our cultural heritage.</li> <li>■ Woolmer Forest has important historic associations. Formerly a royal hunting forest, it also has associations with military history. Both these aspects of history are important locally and also in land management decisions.</li> </ul>

Landscape attribute	Justification for selection
<p>Remaining pockets of tranquillity, especially in the south-west.</p>	<ul style="list-style-type: none"> <li>■ 27 per cent of the NCA classified as undisturbed according to CPRE data.</li> <li>■ The south-west of the NCA retains a distinctive tranquil character. Remaining pockets of tranquillity in the centre and east are particularly valuable given the extent of surrounding development.</li> </ul>
<p>Recreation supported by 3,315 km of public rights of way, with over 6,700 ha of open access land, representing over 4.5 per cent of the NCA.</p>	<ul style="list-style-type: none"> <li>■ Recreation links connect with the adjacent North Downs and South Downs national trails, while the south-west forms part of the South Downs National Park.</li> <li>■ The Surrey Greensand is particularly important for recreation given its proximity to London.</li> <li>■ Recreational pressures may increase as a result of new housing development. This may have important implications for the more sensitive habitats, particularly heathlands which are vulnerable to disturbance.</li> </ul>

## Landscape opportunities

- Protect and enhance the intimate rural character of the south-west and remaining areas of tranquillity throughout the NCA, especially within the protected landscapes, including the rural settlement pattern of dispersed farmsteads and hamlets and some nucleated villages and the distinctive sunken lane network.
- Protect, conserve, and enhance the historic and geological environments, including a) through the restoration of historic parklands, with re-introduction of pollard management to conserve wildlife rich veteran trees where appropriate, b) conservation of geological exposures further benefiting wildlife communities and exposures at the coast c) conservation and appropriate restoration of historic buildings including oast houses and timber framed barns d) maintenance of other historic features such as hammer ponds and prehistoric monuments along the scarp.
- Manage and significantly enhance the variety of ancient and broadleaved woodland throughout the NCA which reflects the underlying geology, expanding and re-linking woodland blocks where appropriate. Reintroduce active coppice management and pollarding where this will enhance wildlife interest and enhance adaptation to climate change. Managing woodlands may also provide a source of local fuel and timber products. Where woodlands form part of the mixed farm mosaic support landowners in integrating woodland management into their farm business.
- Manage and enhance the wetland habitats associated with the area's rivers, notably the Arun, Rother and Wey, including alluvial grazing meadows with drainage ditches, marshy grassland, reedbeds and wet woodland, expanding and reconnecting habitats to enhance landscape, biodiversity and habitat adaptation to climate change.
- Manage and enhance the agricultural landscape through the restoration of hedgerow boundaries, especially where they will reinforce historic field patterns and enhance landscape character in peri-urban areas, while reinforcing the wildlife network. In addition, seek to integrate environmentally beneficial land management into the farmed landscape which will benefit pollinators and help strengthen the network of habitats. Where remaining, support the restoration and continued management of traditional orchards for their contribution to sense of place, sense of history and genetic diversity.
- Plan for a landscape-scale approach to the sustainable management of the area's lowland heathlands. Expanding, improving, connecting and buffering heaths, where feasible, while reconnecting and engaging communities with their local heathlands. The management of heathlands will need to maintain both the ecology associated with lowland heathlands while providing for the needs of local communities and visitors.
- Enhance the area's acid grasslands and other unimproved pastures that occur among the heathlands (as well as in parkland and commons), to significantly enhance landscape as well as habitat adaptation to climate change and to improve the overall network of habitats.

**Continued on next page...**

## Landscape opportunities continued...

- Plan for the creation of new landscapes especially within the eastern half of the NCA, including areas of sustainably managed broadleaved woodland, to help assimilate existing and disused mineral workings and landfill sites into the landscape, and provide a robust landscape framework for new and existing development, significantly enhancing landscape character and strengthening the wildlife network and adaptation to climate change.
- Improve physical and mental health, through contact with inspirational landscapes, and to help boost rural businesses. Preserving and improving routes, including at the coast. Increase the number of connecting permanent and permissive routes to link with the North Downs and South Downs national trails, high profile greenspaces and tourist attractions. Where appropriate, upgrade paths to increase capacity for horses and cyclists and provide new sustainable routes along the river valleys. Recognise and manage the impacts of access on sensitive sites, where recreational pressures threaten their ecological integrity and avoid enhanced access provision where it may have a detrimental impact on key biodiversity sites.
- Work with the protected landscape partnerships of the Kent Downs AONB, Surrey Hills AONB and the South Downs National Park to help meet the ambitions of their management plans to conserve and enhance the outstanding scenic and natural beauty of the area.
- Conserve and protect the quality and quantity of surface waters and the sandstone aquifer through partnership working at the catchment scale, supporting existing catchment initiatives and encouraging the implementation of land management practices to improve the quality of water and help meet the objectives of the Water Framework Directive.
- Plan for landscape scale projects which enhance habitat connectivity in the peri-urban, urban and rural environments, taking account of the urban fringe pressures and the opportunities for well planned and managed green infrastructure to deliver societal, economic and environmental benefits in and around urban areas, where development is allocated and permitted.
- Plan and manage for the effects of coastal change by allowing the operation of natural coastal processes where possible, and improving the sustainability of current management practices.

## 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>	<p>Livestock production</p> <p>Cereal production</p> <p>Fertile and versatile soils</p> <p>Fruit growing area with orchards and cobnut plats</p>	<p>An area of mixed farming that produces significant amounts of cereals and other arable crops, livestock including sheep, pigs and cattle, and notably fruit growing and other horticultural crops.</p> <p>Hop production was once extensive in this NCA, but has declined to almost nothing.</p> <p>Commercial fruit growing has replaced the more traditional orchards and is notable in the central area of the belt. The NCA is a stronghold for cobnut production in England, with the two remaining cobnut plats in Kent found within the NCA.</p> <p><b>Continued on next page...</b></p>	National	<p>Agricultural change will be driven by changes in the market which will be influenced by factors such as climate change and population growth.</p> <p>Commercial fruit growing is likely to use new growing techniques which may impact on landscape character, but result in greater productivity. These changes are likely to be driven by the need to protect fruit from adverse weather as a result of climate changes, and to limit the risks of pests and diseases. The fruit growing belt makes an important contribution to sense of place and is an important component of the mixed farmed landscape.</p> <p>Climate change may provide opportunities for new crop types.</p>	<p>Work with landowners to support the long tradition of a productive mixed farmed landscape, promoting land management interventions which will help safeguard future yields and protect the water and soils of the area.</p> <p>Identify opportunities for local produce initiatives, especially where it provides links between food provision, landscape character and biodiversity.</p>	<p><b>Food provision</b></p> <p><b>Water availability</b></p> <p><b>Genetic diversity</b></p> <p><b>Regulating soil erosion</b></p> <p><b>Regulating soil quality</b></p> <p><b>Regulating water 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>Food provision cont.</b>		<p>... continued from previous page</p> <p>Changes in horticultural production methods have resulted in increased use of polytunnels.</p>		<p>Development pressures may lead to the loss of some agricultural land, particularly in peri-urban areas. It will be important to safeguard high quality agricultural land to maintain food security.</p>	<p>Protect and promote the remaining cobnut plats and remaining traditional orchards, for their contribution to sense of place, sense of history and genetic diversity.</p> <p>For new crops, these should be sensitively integrated into the landscape and care taken to avoid adverse impacts on other services.</p>	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Timber provision</b>	<p>Conifer plantations account for 6 per cent of the NCA, 8,647 ha</p> <p>Broadleaved woodlands account for 17 per cent of the NCA, 24,943 ha</p>	<p>The woodland resource of the NCA is of national significance and the Greensand has some of the highest densities of ancient woodland in England. Timber is supplied mainly from commercial coniferous plantations on larger estates. These tend to be mostly dominated by Douglas fir with the woodland products used locally.</p> <p>Extraction can be challenging in parts of the NCA where broadleaved woodlands are on the steeper slopes or wetter ground of the western part of the NCA. Commercial extraction in these instances is unlikely to be economic.</p>	Local	<p>There would need to be a market driver for any significant expansion in timber production outside of the existing commercial plantations.</p> <p>Unmanaged woodlands could be brought under management and used as a source of high quality hardwood timber where the topography and environmental sensitivity are not limiting factors for extraction. This would depend on the demand and markets for locally sourced hardwood.</p> <p>Extracting softwoods from PAWS (planted ancient woodland) will provide one-off supply of timber from a few sites.</p>	<p>There is an opportunity to improve management of the existing woodland resource to extract timber which could have multiple benefits including, carbon sequestration as a result of regeneration and improving biodiversity.</p> <p>This would require the support and promotion of new and existing markets for local wood products to encourage sustainable and viable woodland management.</p> <p>There is an opportunity to extend woodland cover and management for timber, particularly where this will bring multiple benefits, such as enhancing landscape character, regulating climate, flooding and soil erosion.</p>	<p><b>Timber provision</b></p> <p><b>Biomass energy</b></p> <p><b>Climate regulation</b></p> <p><b>Regulating soil erosion</b></p> <p><b>Regulating soil quality</b></p> <p><b>Regulating water flow</b></p> <p><b>Sense of place / inspiration</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>Water availability</b>	<p>The majority of the area overlies post carboniferous rock – a sandstone aquifer, with a small area in the west overlying a chalk aquifer.</p> <p>Rivers and water courses</p>	<p>Availability of water is a problem throughout the entire area. Current quantitative assessment for the Lower Greensand aquifer indicates poor availability<sup>15</sup>.</p> <p>In terms of surface water most of the central and eastern parts of the NCA are classed as over licensed or over abstracted, in the west a fairly large area has no water available for further abstraction at low flows and in the south-west areas are classed as over-licensed or over-abstracted. For more information see the relevant Catchment Abstraction Management Strategies<sup>16</sup>.</p>	Regional	<p>Water availability in surface waters and the aquifer are under pressure from existing abstractions for public water supply and use in industry and agriculture. In many cases existing licences allow for more than is currently taken which could be of concern in the future.</p> <p>Water availability and resource issues are likely to be exacerbated by future development in the area and increasing demands, with climate change impacts potentially creating an additional stress on resources. There will need to be a balance between meeting these demands and protecting both surface and groundwater resources.</p> <p><b>Continued on next page...</b></p>	<p>Work in partnership and across sectors to protect the wetland sites, particularly those that are nationally and internationally designated, including wet heath and grasslands by ensuring that water levels are sufficient to meet the habitat and species requirements, avoiding unsustainable abstraction.</p> <p>Promote efficient water use to help address the challenges of meeting existing and future water demands, taking into account the likely impacts of climate change and increasing awareness and education on water resource issues. Use methods such as, water harvesting and sustainable drainage systems to help drive efficiency improvements in existing and new developments.</p> <p>Maximise the opportunities for water harvesting and storage from farm holdings, especially from new polytunnel schemes.</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> <p><b>Sense of place / inspiration</b></p> <p><b>Food provision</b></p>

<sup>15</sup> Thames River Basin Management Plans, Environment Agency (2009), South East River Basin Management Plan, Environment Agency (2009)

<sup>16</sup> Arun and Western streams, abstraction licensing strategy, Environment Agency (2013) Wey Catchment abstraction licensing strategy, Environment Agency (2012) Mole abstraction licensing strategy, Environment Agency (2013) Medway abstraction licensing strategy, Environment Agency (2013) Stour abstraction licensing strategy, Environment Agency (2013)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability cont.				<p><b>... continued from previous page</b></p> <p>The aquifer has an important role in maintaining spring and baseflows of rivers, any low flows as a result of abstraction directly from surface water or the aquifer will potentially damage the ecology of rivers and wetlands. In particular the Lower Greensand aquifer provides baseflow to the internationally important wildlife sites of the Arun Valley SPA, SAC and Ramsar.</p> <p>The Wey catchment contains internationally important heathland sites which support water dependent habitats, such as wet mire, wet heath and bog. The ecology of these habitats is susceptible to changes in water availability. This is also the case in the Mole catchment. Although only a relatively small stretch is within the NCA, the water dependent habitats at Reigate Heath SSSI have suffered due to hydrological changes.</p>		

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Genetic diversity</b>	Orchards	This NCA makes an important contribution as a major fruit growing area and remaining traditional orchards, while few in number contain locally distinctive varieties such as the Kentish cobnut.	Regional	<p>Genetic diversity of orchard fruit varieties are important to maintain and safeguard food provision and afford increased resilience to climate change and disease.</p> <p>Orchards are important for their heritage, landscape character and local distinctiveness value.</p> <p>It is important to use the traditional orchard resource for education on the history of fruit growing, its heritage value and how the industry has evolved into the fruit growing areas evident today.</p>	<p>Protecting and appropriately managing remaining areas of traditional orchards, recognising their role in genetic diversity and fostering local community engagement in promotion of local products.</p> <p>Consider opportunities for orchard restoration or creation alongside any new developments, especially where this would provide links between landscape character, local food provision, genetic diversity and sense of place and history.</p>	<p><b>Genetic diversity</b></p> <p><b>Sense of place / inspiration</b></p> <p><b>Sense of history</b></p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Biomass energy</b>	Woodland – ancient mixed woodland and coniferous plantations	<p>The existing woodland cover (25 per cent of the NCA, 36,921 ha) offers significant potential for the provision of biomass through bringing unmanaged woodland under management.</p> <p>The NCA has been identified as having a high potential yield for miscanthus, while short rotation coppice (SRC) is generally medium, with central areas around Redhill and Reigate, where lighter loams occur, identified as being more suitable. While the potential has been identified as high and medium, these biomass crops do not form part of the current landscape character and any location of biomass crops would need to be very carefully considered for landscape impacts.</p>	Regional	<p>Existing woodland offers potential for biomass. Improved management of woodlands for wood fuel could have multiple benefits including biodiversity gains; however the feasibility of this will be dependent upon the economics and market drivers.</p> <p>In response to climate change, there may be increasing demand for biomass crops. While the NCA has been identified as having a high potential yield for miscanthus and medium potential for SRC where lighter loams occur, any biomass plantings would need to be carefully sited to ensure no adverse impacts on the character of the landscape or other services.</p>	<p>Support existing and establish new markets to encourage the use of woodlands for local biomass. Restoration of coppice management to appropriate areas of woodland will improve biodiversity and provide a local source of wood fuel with potential benefits for climate regulation.</p> <p>Where appropriate consider other sources of biomass, taking into account landscape character, water availability and other services.</p>	<p><b>Biomass energy</b></p> <p><b>Timber provision</b></p> <p><b>Water availability</b></p> <p><b>Climate regulation</b></p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Climate regulation</b>	<p>Soils – freely draining very acid sandy and loamy soils</p> <p>Woodland and hedgerows</p> <p>Heathlands</p> <p>Wetland habitats</p>	<p>Across almost all of the character area there is a relatively low proportion of carbon stored in the top soil horizon, although there are small fragmented areas of higher carbon content, particularly in the north associated with heathland habitats.</p> <p>The diversity of habitats within this NCA including woodland, wetlands, heathlands and permanent grasslands suggests the NCA has an important role to play in its contribution to climate regulation through its existing and potential role in carbon storage and sequestration.</p> <p>Urban centres in the NCA are using green infrastructure strategies to plan a network of green infrastructure capable of sequestering carbon and contributing to reducing the impacts of urban heat island effects.</p>	Regional	<p>It has been recognised that UK woodlands and trees have the potential to play an important role in reducing and sequestering greenhouse gas emissions. Sustainable management of woodlands with sustainably produced wood fuel and wood products could help fulfil this potential. This would also provide other services for example, reinforcement of a sense of place and history, and increased biodiversity by restoring some of the local traditional woodland management.</p> <p>Favourably managed wetland, heathland and grassland habitats and maintaining their extent will also be of benefit for carbon sequestration and soil carbon storage with potential for multiple benefits such as water regulation (flooding), soil quality and reduction in soil erosion and biodiversity gains.</p> <p>Soils may have potential for carbon storage by increasing organic matter inputs, employing minimum tillage techniques and retaining buffer strips as an example.</p>	<p>Work with farmers and land managers to improve management of existing habitats across the NCA, particularly the woodlands, heathlands and wetlands to conserve organic and peaty topsoils that provide a store of carbon, while achieving multiple benefits for other services.</p> <p>Encourage farmers and land managers to adopt good soil management practices including enhancing organic matter content to improve soil quality and long term soil resilience to climate change.</p> <p>Opportunities for the creation of new habitats may also be appropriate and of benefit both for climate regulation and other services such as regulating soil erosion and water flow. Any creation of habitats needs to be carefully considered to ensure they are sited appropriately.</p> <p><b>Continued on next page...</b></p>	<p><b>Climate regulation</b></p> <p><b>Regulating soil erosion</b></p> <p><b>Regulating soil quality</b></p> <p><b>Regulating water quality</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
Climate regulation cont.					<p><b>... continued from previous page</b></p> <p>There are opportunities to further our understanding of the role of the NCAs woodlands and heathlands in a changing climate, working in partnership and promoting the multiple benefits of sustainable woodland and heathland management.</p> <p>Work with local planning authorities and developers to ensure a strong network of green infrastructure is included in new developments, with retro-fitting encouraged to support climate regulation service in existing developments.</p>	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Rivers	Groundwater chemical quality is generally classified as poor or poor deteriorating. Groundwater is vulnerable to nitrates and pesticides and local impacts of solvents, hydrocarbons and heavy metals.	National	<p>Given the balance of rural and urban areas within the NCA a combination of measures will be needed to reduce urban diffuse pollution and diffuse pollution from agriculture to improve water quality. Actions identified include reducing phosphate from wastewater effluent discharges, ensuring good urban drainage, reducing diffuse pollution from agriculture and enhancing riparian habitats.</p> <p>Run-off risks from some of the soils due to poor infiltration qualities increases potential for diffuse pollution from applied nutrients to agricultural land.</p> <p>Habitats and species are sensitive to changes in water quality and poor quality also impacts on the quality and hence cost of the public water supply.</p> <p>Good quality water environments can be important for social, economic and quality of life benefits.</p>	<p>Promote the principles of Catchment Sensitive Farming both within the existing priority catchments of the Stour, Medway and Arun and Western Rother but also more generally to reduce the risks of diffuse pollution from agriculture and to protect and enhance the surface and groundwaters of the NCA.</p> <p>Work in partnership and across sectors to deliver Water Framework Directive objectives, supporting existing catchment based initiatives.</p> <p>Where development is permitted good green infrastructure should incorporate sustainable drainage systems.</p> <p><b>Continued on next page...</b></p>	<p><b>Regulating water quality</b></p> <p><b>Regulating soil erosion</b></p> <p><b>Regulating soil quality</b></p> <p><b>Biodiversity</b></p>
	Groundwater	There is variation in the ecological and chemical quality of rivers across the NCA. The chemical status of the main rivers is predominantly good although the River Medway fails on chemical quality due to the presence of priority hazardous substances <sup>17</sup> .				

<sup>17</sup> South East River Basin Management Plan, Environment Agency (2009) Thames River Basin Management Plan, Environment Agency (2009)

<sup>18</sup> Note: For surface waters there are now two separate classifications for water bodies under the Water Framework Directive, ecological and chemical. To be in 'good' status both ecological and chemical status must be at least good. Ecological status integrates biological, physico-chemical and morphological factors and is not purely a measure of water quality. For more information on Water Framework Directive statuses in this NCA please refer to the relevant River Basin Management Plans.

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality cont.					<p><b>... continued from previous page</b></p> <p>Significant restoration and creation of semi-natural wetland habitats, including alluvial grazing meadows with drainage ditches, marshy grassland, reedbeds and wet woodland, where appropriate adjacent to watercourses within the NCA plus creation of grassland buffer strips running across slopes to help limit diffuse pollution from agriculture and thus improve river water quality.</p>	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Regulating water flow</b>	Streams and rivers draining off the dip slope	<p>Localised flooding occurs across the NCA.</p> <p>Land adjacent to the Mole and Wey has been subject to significant flooding in the past including the very significant flooding of Godalming (in the Wealden Greensand) and Guildford (in the adjacent Thames Basin Lowlands NCA) on the course of the Wey in 1968.</p> <p>For detailed information on each river within the NCA, the Catchment Flood Management Plans provide an overview of flood risk and suggest measures for managing flood risk in the future<sup>19</sup>.</p> <p>In general, preferred alleviation measures include encouraging the use of sustainable urban drainage systems in new development, as well as storing water and managing run-off in the wider river catchments.</p>	Regional	<p>Flood risk within this NCA is likely to increase as a result of climate change. It will be important to ensure that any new development and its infrastructure are suitably designed to reduce the risk of flooding.</p> <p>Where soils are slowly permeable they will tend to have poorer water infiltration with greater potential for rapid runoff. It is therefore essential to maintain good soil structure and improve storage of water in flood plains to help reduce flood risk.</p>	<p>Opportunities for adopting sustainable flood risk management options, taking account of future climate change and land use changes.</p> <p>Alleviation measures that include encouraging the use of sustainable urban drainage systems in new development are critical in an NCA which includes large urban centres and is likely to be under increasing pressure for development.</p> <p>Restoration and creation of favourably managed wetland habitats along the flood plains of the Arun and Rother, the Wey and Mole, Medway and the Stour catchments, bringing rivers back into continuity with their flood plains where appropriate to allow for more regular flooding of identified areas (as per the catchment flood management plans) as a solution to help alleviate downstream flooding.</p>	<p><b>Regulating water flow</b></p> <p><b>Regulating soil erosion</b></p> <p><b>Regulating soil quality</b></p> <p><b>Regulating water quality</b></p> <p><b>Biodiversity</b></p>

<sup>19</sup> Arun and Western Streams Catchment Flood Management Plan, Environment Agency (2009) River Stour Catchment Flood Management Plan, Environment Agency, (2009) River Medway Catchment Flood Management Plan, 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>	Woodland Arable systems Permanent grassland	<p>The majority of soils are classified as grade 3 agricultural land.</p> <p>There is a variation in soil types across the NCA with 10 different soilscape identified. Freely draining slightly acid loamy soils - covering around a third are the most extensive. Freely draining but very acid sandy and loamy soils, typically in heathland or forestry use, and freely draining slightly acid but base rich soils are also extensive. Contrasting slowly permeable seasonally wet, loamy and clayey soils and flood plain soils are less common and associated with wetter low lying land and wetland habitats.</p>	Local	<p>Freely draining soils are valuable for aquifer recharge of the sandstone aquifer and require maintenance of good structural conditions to aid water infiltration and the avoidance of rapid run-off.</p> <p>There is the potential to increase the organic matter of the soils to help improve soil quality. Organic matter may be lost on arable fields and makes these soils more susceptible to compaction and erosion.</p> <p>Soils with a higher clay content can have poor water infiltration qualities and can be easily poached by livestock and damaged by machinery when wet, increasing the likelihood of surface water runoff.</p> <p>The predominance of freely draining soils means that added nutrients need to be carefully balanced with needs to prevent diffuse pollution.</p> <p>Soils within woodland areas and areas of permanent grassland will often have higher organic matter levels, deeper root penetration which benefits water infiltration and overall structure. Management of these areas needs to be sensitively timed to avoid damage to soils.</p>	<p>Work with landowners to improve soil quality and management. Protecting the sustainability of future yields, while benefiting other regulatory services such as water availability, water quality and avoidance of soil erosion through improving organic matter levels, soil structure and water infiltration.</p> <p>Maintain and appropriately manage areas of permanent grassland, semi-natural woodland and other green infrastructure to protect the soil resources. Minimise harm to soil resources during development.</p>	<p><b>Regulating soil quality</b></p> <p><b>Regulating water quality</b></p> <p><b>Climate regulation</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>Regulating soil erosion</b>	Semi-natural habitats	<p>Freely draining loamy and/ or sandy soils generally have enhanced risk of soil erosion on moderately or steeply sloping land where cultivated or bare soil is exposed. Wind erosion can sometimes be an issue for these soils. Soils with a high fine sand or silt content are at risk of capping and slaking which may increase run –off and erosion risk. The seasonally wet and flood plain loamy/clayey soils are generally at lower risk of erosion, but where sloping water run-off may be enhanced where water infiltration is slow.</p> <p>The south-west of the NCA falls within the Arun and Western Rother Priority Catchment, where steeper sandy soils under arable cultivation are highly prone to erosion.</p>	Regional	<p>Regulation of soil erosion is important not only in its own right but also in terms of the impacts of soil erosion on other services such as water and soil quality and ultimately sustainable food production.</p> <p>Climate change impacts may result in an increased risk of erosion associated with flash floods, drier summers and wetter winters.</p> <p>Integration of land management interventions which accord with the existing landscape character would be beneficial, for example buffer strips, woodlands and hedgerows – this will also benefit biodiversity and could help strengthen the overall connectivity and mosaic of habitats.</p>	<p>Work with landowners to implement land management practices, especially on steeper slopes, to reduce soil erosion. This includes provision of buffer strips, restoration and creation of hedgerows, woodland creation where appropriate and creation of other areas of low input grasslands and semi-natural habitats in high risk areas. Seek to minimise soil compaction, improve water infiltration and reduce soil migration and surface runoff, for example by enhancing soil organic matter levels and timely cultivations. In addition, seek to link habitats and improve connectivity where possible, contributing to the biodiversity and sense of place of the area.</p> <p>Promote the work of the Catchment Sensitive Farming initiative.</p>	<p><b>Regulating soil erosion</b></p> <p><b>Biodiversity</b></p> <p><b>Regulating soil quality</b></p> <p><b>Regulating water quality</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>Pollination</b>	<p>Lowland heathland</p> <p>Unimproved acid grasslands</p> <p>Unimproved pastures</p> <p>Orchards</p>	<p>The existing habitats of heathlands, grasslands and woodlands provide important nectar sources and habitats for pollinating insects.</p> <p>Orchard and soft fruit pollinators are important in this NCA given the fruit growing areas.</p>	Local	<p>Pollinators play an important role in food provision and the mixed farming landscape, including arable and fruit, means that pollination services are important in maintaining future food provision and viability of crops within the NCA.</p> <p>A landscape scale approach which creates pollinator habitats in suitable locations throughout the farmed landscape will benefit not only pollinators but will also help to enhance habitat connectivity and biodiversity while bringing potential benefits for soil and water regulation depending upon locations and chosen options.</p>	<p>Increase the pollinator habitat through expansion and linking of semi-natural habitats seeking to increase the diversity of habitats in close proximity to food crops requiring pollination. In particular, restoration and expansion of heathland and unimproved grassland habitats plus enhancement of arable areas through creation of conservation headlands, pollen and nectar mixes and arable field margins will help to provide nesting and foraging sites for pollinators.</p>	<p><b>Pollination</b></p> <p><b>Biodiversity</b></p> <p><b>Food provision</b></p> <p><b>Sense of place / inspiration</b></p>
<b>Pest regulation</b>	<p>Existing semi – natural habitats</p> <p>Field margins</p> <p>Species-rich hedgerows</p>	<p>There are large areas of semi-natural habitat which will support species that will aid pest regulation.</p>	Local	<p>Pest regulation is currently provided by the existing spread of semi-natural habitat across the NCA. However, there is scope to improve the condition of this habitat through appropriate management and to extend it where possible, reducing the impacts of pests across the agricultural landscape and supporting a network of habitats, making the landscape more permeable for pest regulating species. However, increased permeability for predatory species may also increase opportunities for and the range of pest species.</p>	<p>Maintain and expand the area of semi-natural habitats, throughout the NCA to provide a range of niches to support pest regulating species.</p> <p>Restoration and expansion of heathland and unimproved grassland habitats (including acid grasslands found amongst commons, heathlands and parklands and wet meadows along the valley floor), plus enhancement of arable areas through creation of conservation headlands and arable field margins will all be of benefit.</p>	<p><b>Pest regulation</b></p> <p><b>Biodiversity</b></p> <p><b>Food production</b></p> <p><b>Pollination</b></p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Regulating coastal erosion</b>	Undeveloped sea cliffs	Long-term policies of 'Hold the Line' are identified within the Shoreline Management Plan along the relatively small stretch of coastline that falls within the NCA, given the significance of development at Folkestone and Hythe that essentially determines this stretch. The exception is at Copt Point where preferred policies allow for the ongoing erosion of maritime sand/clay cliffs.	Regional	<p>The area is at risk from coastal squeeze as habitats will be caught between rising sea level and hard defences. Sea level rise will continue to affect coastal processes (reduction in the amount of sediment available for downdrift frontages) habitats, heritage assets and geodiversity. A loss of fronting beaches may also have implications for tourism.</p> <p>The small area of coastline which falls on the far eastern boundary of the NCA is part of the Dover-Folkestone Heritage Coast.</p> <p>Long-term policies of 'Hold the Line' seek to reduce the risk of flooding not prevent it, as storms exceeding the protection level of the defences could occur.</p>	Plan and manage for the effects of coastal change, allow the operation of natural coastal processes where possible and the creation of new habitats, to maintain and enhance local landscape character, biodiversity and improve sustainability of current management practices and to reduce flooding to built areas.	<p><b>Regulating coastal erosion</b></p> <p><b>Biodiversity</b></p> <p><b>Sense of place / inspiration</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>A sense of place/ inspiration</b>	<p>Geology and landform</p> <p>Settlement pattern</p> <p>Semi-natural habitats</p> <p>Historic assets</p>	<p>Sense of place is provided by the prominent Greensand ridge that affords far-reaching views over the Low Weald from the scarp top, as well as the extremely varied landscape character, a result of the diverse underlying soils, geology and overlying land use, including extensive areas of lowland heathland, ancient woodland and the wooded commons or charts.</p> <p>The rural settlement pattern and intimate character of the west, the proximity to the coast in the east and the mixed farm landscape with traditional fruit growing areas all add to the sense of place.</p> <p>The heritage assets and historic characteristics of the NCA also add to the sense of place including the vernacular building materials.</p>	National	<p>Maintaining sense of place is likely to become more challenging as the NCA responds to pressures such as development and associated infrastructure or climate change. However, these challenges also offer opportunities for enhancement of sense of place through careful management of the natural and built heritage.</p> <p>The special qualities and outstanding scenery of parts of this area are reflected in the designation of the South Downs National Park, the Kent Downs AONB and the Surrey Hills AONB.</p>	<p>Conserve and restore the extensive and highly characteristic areas of lowland heathland (in Surrey, Hampshire and Sussex) and ancient woodland that include the distinctive hanger woodlands found on steeper slopes (notably in East Hampshire) and the wooded commons or charts characteristic of east Surrey and western Kent.</p> <p>Work with AONB partnerships and National Park Authority, local communities and others to retain the historic and cultural features of the landscape, particularly the intimate character of the south-west that falls largely within the South Downs National Park, with its deeply sunken rural lanes, and the character of the AONB landscapes in western and central areas.</p> <p>Identify and seek to maintain the numerous uncluttered, far-reaching views over the Low Weald and adjacent NCAs from the scarp tops.</p> <p>Maintain the mixed farmed landscape including orchards that provide strong associations with the fruit growing areas and heritage of the NCA.</p>	<p><b>Sense of place / inspiration</b></p> <p><b>Sense of history</b></p> <p><b>Biodiversity</b></p> <p><b>Recreation</b></p> <p><b>Tranquillity</b></p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Sense of history</b>	<p>Range of heritage assets reflecting human occupation since Palaeolithic times</p> <p>Maritime and military history</p> <p>Historic settlements and vernacular buildings</p> <p>Ancient semi-natural woodland the hangers – provide a sense of time depth</p> <p>Roman roads</p> <p>Large houses set in landscaped parks or gardens.</p> <p>Oast houses</p> <p>Woolmer Forest – former royal hunting forest</p> <p>Remnant water meadow system along the river Wey with associated historic bridges</p>	<p>The history of this landscape is evident in the predominantly irregular-patterned fields and the ancient road network, including winding sunken lanes and Roman roads as well as the area’s prehistoric associations, including bronze-age tumuli near Petersfield, iron-age hillforts at Holmbury, Anstiebury and Oldbury Hill, and Neolithic remains at Abinger.</p> <p>Numerous large house and designed parklands, including Petworth in Sussex, Knole, Squerries Court and Leeds Castle in Kent.</p> <p>The traditional vernacular of local sandstone and patterned dark carrstone (known as ‘galletting’) most notably in Surrey. The hammer ponds associated with iron workings along the foot of the north-west escarpment also contribute to sense of history and links to industrial past.</p>	National	<p>Some nationally significant heritage assets have been identified on the heritage at risk register and a number of historic assets are vulnerable to further loss or damage.</p> <p>The coherence of the historic environment is at risk in places from increased development and infrastructure pressures. The distinctive historic character of some settlements is being eroded, particularly the common-edge settlements on the Hampshire/Surrey border.</p> <p>Climate change may have an impact on the heritage assets. Continued coastal erosion at Copt Point along the coast will result in loss of the Folkestone Roman Villa SAM and associated areas of archaeological potential.</p>	<p>Conserve the irregular field pattern and the ancient road network, including winding sunken lanes and the Roman roads radiating from Canterbury (outside the area) in the east, as well as the area’s prehistoric associations, including bronze age tumuli, iron-age hill forts and Neolithic remains.</p> <p>Conserve, manage and restore the numerous parklands that are characteristic of the area, as well as the traditional vernacular of local sandstone and patterned dark carrstone (known as ‘galletting’) most notably in Surrey.</p> <p>Further conserve the hammer ponds associated with iron workings along the foot of the north-west escarpment, the historic bridges along the River Wey and remnants of the water meadow system, maintaining their historic interest and links to past land management and contribution to landscape character.</p>	<p><b>Sense of history</b></p> <p><b>Geodiversity</b></p> <p><b>Sense of place / inspiration</b></p> <p><b>Biodiversity</b></p>

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<b>Tranquillity</b>	Intimate rural character in the south-west  Woodlands	<p>Twenty-seven per cent of the NCA is classified as 'undisturbed' according to CPRE data; a decline from over 60 per cent since the 1960s.</p> <p>Tranquillity is mostly generally associated with the intimate rural landscape of the south-west (much of which falls within the South Downs National Park), in contrast with the more heavily developed eastern and central areas. Tranquillity is still nevertheless likely to be associated with the extensive chain of heathlands and ancient woodlands that occur throughout east Hampshire, Surrey and west Kent.</p>	Regional	<p>Proximity to large centres of population and increased development pressures may impact on the tranquillity of the area.</p> <p>Tranquillity of green space is important for relaxation and mental health, with added economic benefits of a population that is healthier through participation in walking, cycling, and other activities. Conversely, recreational pressures also have the potential to impact on tranquillity, especially due to illegal or inappropriate recreation.</p> <p>The wooded character of the landscape does offer a mechanism to help reduce the impacts on tranquillity from visual disturbance or noise.</p>	<p>Expand and create broadleaved woodlands in central and eastern areas around transport corridors and major urban areas to help limit noise and light pollution and thus protect or re-establish pockets of tranquillity away from these areas.</p> <p>Maintain and create woodlands surrounding urban areas that adjoin the Surrey heaths to help conserve and improve the tranquillity of these heathlands, while also conserving existing pockets of tranquillity that are particularly characteristic of the south-west and the AONB landscapes.</p>	<p><b>Tranquillity</b></p> <p><b>Sense of place / inspiration</b></p> <p><b>Sense of history</b></p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Recreation</b>	<p>South Downs Way</p> <p>North Downs Way</p> <p>Greensand Way</p> <p>Wey South Path</p> <p>The Hangers Way</p> <p>Registered commons</p> <p>Open access land</p> <p>Public rights of way network</p> <p>Towpaths associated with the Wey navigations and other riverside walks</p> <p>National Nature Reserves</p>	<p>Recreation and access are supported by 3,315 km of public rights of way (equivalent to a density of 2.3 km per km<sup>2</sup>), including links to both the North Downs Way and South Downs Way, as well as over 8,118 ha of open access land (around 5 per cent of the NCA). Much of the area to the south-west falls within the South Downs National Park, which seeks to offer wide ranging opportunities for countryside recreation and access.</p> <p>The woodland and heathland landscapes of Surrey and west Kent are particularly important for recreation given their proximity to London and other significant urban areas.</p> <p>The rivers of the NCA are important for recreation, with opportunities for walking, angling and on some stretches water based activities such as boating or canoeing. The Wey towpath is particularly valuable for cycling and walking given the urban populations in close proximity.</p>	Regional	<p>Recreation is of particular importance in this NCA, both in terms of the opportunities on offer and managing the impacts of recreational pressures, which can impact on the tranquillity and biodiversity of the NCA if not managed appropriately. This is particularly pertinent given the urban centres within and nearby the NCA and sensitivity of habitats.</p> <p>The challenge is therefore achieving a balance between promoting access opportunities, recognising the wider health and economic benefits while reducing the impacts of inappropriate recreation on key biodiversity and heritage sites. Heathland is especially vulnerable to uncontrolled fires and disturbance to ground nesting birds.</p> <p>Access and recreational activities, particularly close to where people live, brings mental and physical health benefits. A network of trails linking quality green spaces and other visitor destinations can also provide significant benefits in terms of income from local visitors and tourists.</p>	<p>Enhance existing opportunities for access throughout the area, creating new permissive access that links settlements to historical features, the North Downs Way and South Downs Way and other areas of interest, reflecting the ambitions of the South Downs National Park management plan in the south-west.</p> <p>Also create significant new areas of recreational greenspace that form part of new landscapes surrounding urban areas and that provide a significant local recreational resource, notably in Kent and Surrey, helping to relieve pressures from the area's heaths and other sensitive habitats.</p>	<p><b>Recreation</b></p> <p><b>Sense of place / inspiration</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>Biodiversity</b>	<p>Semi-natural habitats</p> <p>Geology and soils</p> <p>Climate</p> <p>Rivers</p>	<p>There are over 26,500 ha of BAP priority habitat covering around 18 per cent of the NCA. These represent a diverse range of habitats and include broadleaved woodland, fen, lowland heathland, coastal and flood plain grazing marsh, reedbeds, lowland dry acid grassland and lowland meadows.</p> <p>The NCA contains 3 SPAs, 8 SAC and 2 Ramsar sites and over 9,116 ha of land that is nationally designated as SSSI. There are also 548 local sites, contributing to the overall habitat network.</p>	International	<p>Some of the more sensitive habitats are at risk from recreational pressures with many of the biodiversity assets located close to and accessible by large populations who use them for informal recreation. These pressures are likely to increase with increasing populations. Heathland habitats are particularly sensitive to disturbance.</p> <p>Maintaining grazing on heathland and some grassland sites is still an issue due to the economics of grazing these habitats.</p> <p>Wetland habitats are at risk where they may be impacted on by abstraction pressures and future climate change impacts on hydrological regimes.</p> <p>As the climate changes the importance of robust ecological networks and connectivity across the landscape will be critical giving species the best chance of adapting.</p>	<p>Significantly restore, create and re-link the fragmented lowland heathland habitats characteristic of the Surrey, Hampshire and Sussex parts of the NCA, as well as sustainably managing and re-linking the extensive ancient woodlands of the steep scarp slopes and valley floors.</p> <p>Also restore, expand and re-link the wetland habitats of river valleys, notably the Arun and Rother in west Sussex and the Wey, including alluvial grazing meadows with drainage ditches, marshy grassland, reedbeds, and wet woodland.</p> <p>Use evidence to adopt and implement a landscape scale approach to habitat restoration and connectivity of the fragmented habitats of woodland, heathland and wetlands, benefiting biodiversity, sense of place and strengthening the landscape character.</p> <p>Protect and enhance designated sites aiming to achieve favourable condition on all sites and linking them to the wider habitat network.</p> <p>Maximise opportunities through green infrastructure to encourage biodiversity gains and create multi-functional greenspaces which help relieve the pressure on ecologically sensitive sites.</p>	<p><b>Biodiversity</b></p> <p><b>Climate regulation</b></p> <p><b>Regulating water quality</b></p> <p><b>Regulating water availability</b></p>

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<b>Geodiversity</b>	<p>Geological inland exposures including those in quarries</p> <p>Undeveloped sea cliffs</p>	<p>The geology and geomorphology of the Wealden Greensand create its distinctive landscape and have shaped the distribution of wildlife habitats and land use.</p> <p>The NCA contains exposures that are nationally important to geological science, including classical exposures of Lower Greensand and Gault</p> <p>Clay, more recent deposits of windblown sands or loess and landslip features and deposits that show the effects of climate change during past ice ages. In addition to these nationally</p> <p>important exposures, the NCA also contains many sites that are of regional importance.</p> <p>The shoreline management preferred policies allow for the ongoing erosion of maritime sand/clay cliffs at Copt Point to maintain the ecological and geological value of the cliffs.</p>	National	<p>The NCA offers excellent opportunities for research and furthering our understanding of geological and geomorphological features – this is particularly important for helping to demonstrate the links between geology, ecology, archaeology and the socio-economic development of the NCA.</p> <p>The geological resources are at risk from inappropriate management and it will be important to conserve and enhance the existing resource. In addition, the NCA has been a critical area for mineral extraction and mineral safeguarding may become increasingly important to protect national resources into the future.</p> <p>Continued erosion of the cliffs will maintain the geological assets.</p>	<p>Ensure important geological exposures are properly managed to prevent them becoming obscured or otherwise inaccessible for study as a result of vegetation growth, quarrying, waste disposal or other activities.</p> <p>Maintain a network of Regionally Important Geological Sites (RIGS) to facilitate protection of important geological sites.</p> <p>Encourage local authorities to adopt policies in development plans that protect important geological sites.</p> <p>Promote the scientific and educational value of important geological sites and in particular the links between geology, landscape and wildlife habitat development.</p> <p>Allow for continued natural erosion of the important geological assets at the coast.</p>	<p><b>Geodiversity</b></p> <p><b>Biodiversity</b></p> <p><b>Sense of place / inspiration</b></p> <p><b>Sense of history</b></p> <p><b>Regulating coastal erosion</b></p>

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