



Introduction

As part of Natural England's responsibilities as set out in the Natural Environment White Paper¹, Biodiversity 2020² and the European Landscape Convention³, 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.

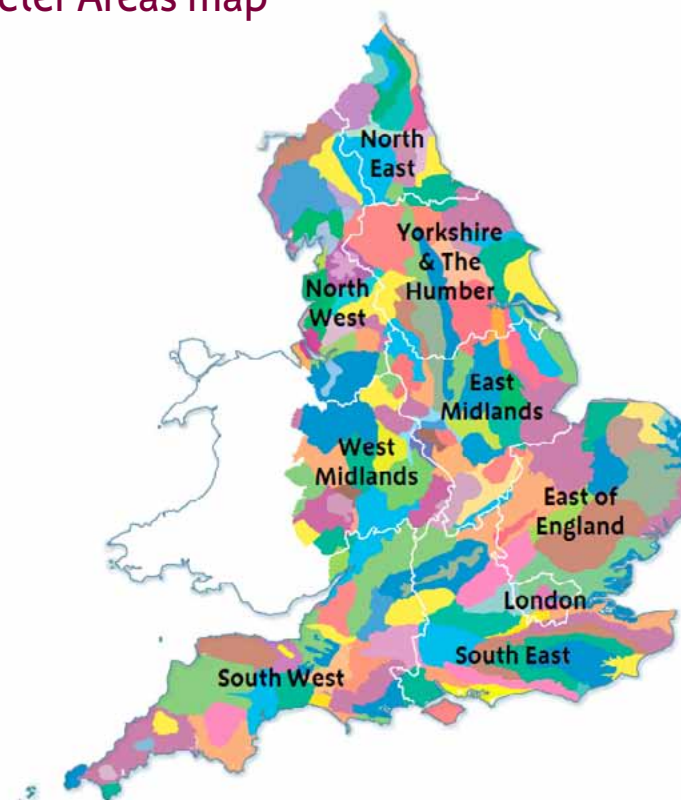
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and 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

National Character Areas map



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

² 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)

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

Summary

The Northern Thames Basin is a diverse area which extends from Hertfordshire in the west to the Essex coast in the east. It is separated from the North Sea and Thames Estuary by a narrow band of land that makes up the Greater Thames Estuary National Character Area (NCA). Included within this NCA are the suburbs of North London and also historic towns and cities including St. Albans and Colchester, as well as new and planned towns such as Welwyn Garden City, Hatfield and Basildon. Although arable agriculture is a large industry in the area the soil quality ranges from good to poor quality. The London Clay provides a poor quality soil that becomes waterlogged in winter and cracks and shrinks in summer. Better quality soil is found in areas that contain alluvial deposits from the Thames and other rivers in the area as they formed and changed position over time.

The Northern Thames Basin is an area rich in geodiversity, archaeology and history and diverse landscapes ranging from the wooded Hertfordshire plateaux and river valleys, to the open landscape and predominantly arable area of the Essex heathlands, with areas of urbanisation mixed in throughout. Urban expansion has been a feature of this area since the 16th century when wealthy merchants who were conducting business in London built homes on its outskirts, mainly in the Hertfordshire area. This trend increased dramatically from the mid-19th century as infrastructure improved and people could travel to work in London from the surrounding areas in an hour or less. This has put increased pressure on the area in terms of extra housing developments, schools and other necessities for expanding populations, with a consequential reduction in tranquillity. Tranquil areas can still be found in parts of Hertfordshire and Essex in areas that have a more dispersed settlement pattern broken up by arable land and semi-natural habitats.

There are a wide variety of semi-natural habitats in the area and these support many important species. However, the habitats have become fragmented over time and a landscape-scale approach is needed to connect them so that they can be sustained and provide beneficial functions including; increasing pollinating insects, acting as flood defences and water storage areas, preventing soil erosion and helping to improve soil and water quality as well as maintaining the area's sense of place and history. This NCA includes many internationally and nationally designated sites including 72 Sites of Special Scientific Interest (20 of which are designated wholly or in part for their national geological importance), 6 Ramsar sites, 6 Special Protection Areas, 3 Special Areas of Conservation and 2 National Nature Reserves. The majority of these sites are estuaries and woodlands. The estuaries support migrating and overwintering birds as well as rare or locally important plants and invertebrates. The selected woodlands are ancient and have a long history of management through coppicing and pollarding, which has allowed rich ground flora to develop and also supports rare mosses and deadwood invertebrates.

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

The main changes to the area have resulted from increased construction and commercial-scale farming. Both of these have increased pressures on water availability, water flow, soil quality, biodiversity and sense of place. Although housing, other construction and agriculture are significant for the area it is important that these are developed in a sustainable way so that predicted changes in climate and the effects on the area's character are considered and sense of place and history are preserved.

The main opportunities available to this area are the continuation of the agricultural tradition, but within this land management should consider methods that are more sustainable in terms of water use and soil quality in order for it to continue to be a viable industry in the future. The areas of various semi-natural habitats also present opportunities to improve water storage and soil quality for surrounding agricultural land as well as to increase advantageous species that will aid pollination and reduce pest species. In addition to this the woodlands in the area could be an important resource to supply timber and fuel to the local area if they were managed effectively.



Farmland next to the River Colne in Essex.

Statements of Environmental Opportunity

SEO 1: Manage rivers and river valleys to protect and improve water quality and help to alleviate flooding in the downstream urban areas, while also helping to improve aquifer recharge and provide a sufficient store of water to meet future need, especially with predicted climatic changes. Conserve the riparian landscapes and habitats, for their recreational and educational amenity for their internationally significant ecological value.

SEO 2: Manage the agricultural landscape and diverse range of soils which allow the Northern Thames Basin to be a major food provider, using methods and crops that retain and improve soil quality, water availability and biodiversity.

SEO 3: Protect and appropriately manage the historic environment for its contribution to local character and sense of identity and as a framework for habitat restoration and sustainable development, ensuring high design standards (particularly in the London Green Belt) which respect the open and built character of the Thames Basin. Enhance and increase access between rural and urban areas through good green infrastructure links to allow local communities recreational, health and wellbeing benefits.

SEO 4: Manage and expand the significant areas of broadleaf woodland and wood pasture, and increase tree cover within urban areas, for the green infrastructure links and important habitats that they provide, for the sense of tranquillity they bring, their ability to screen urban influences and their role in reducing heat island effect and sequestering and storing carbon.



Ancient woodland at Pound Wood in Benfleet, Essex.

Description

Physical and functional links to other National Character Areas

The Northern Thames Basin forms the rising land above the low-lying marshy landscapes adjoining the coast and estuaries of the Greater Thames Estuary and the Suffolk Coast and Heaths National Character Areas (NCAs) to its east and south-east extent and enjoys associated views of these areas. Chalk geology commonly underpins this NCA and the neighbouring Chilterns and South Suffolk and North Essex Claylands NCAs to the west and north; The Chilterns, a formation of chalk hills and plateaux with a prominent escarpment, offers views across to this similarly elevated NCA. To the south-west the Thames Valley NCA forms a wedge-shaped area containing the open Thames flood plain surrounded by rolling clay farmland. Directly south is the Inner London NCA on the banks of the Thames where the river valley widens out into a broad flood plain.

The London Basin Chalk aquifer, which underlies much of the western section of the Northern Thames Basin NCA, is the principal aquifer supplying water to Inner London. The Chalk is confined in the basin by the overlying Tertiary formations of London Clay, which means recharge largely occurs in the extensive Chalk outcrop of the Northern Thames Basin and into the Chilterns NCA to the north and the North Downs to the south.

A small part of the Dedham Vale Area of Outstanding Natural Beauty (AONB) straddles the eastern edge of this NCA, the more northerly South Suffolk and North Essex Claylands and the south-western tip of the Suffolk Coast and



Major transport links include the M25 motorway.

Heaths NCA. The urban character in the south of the Northern Thames Basin continues into the Thames Valley and Greater Thames Estuary NCAs.

The landscape becomes extensively urbanised towards the Inner London NCA and includes major transport links from outside the area such as the East Coast mainline railway, M11 which connects to London and Cambridgeshire, the M1 which passes north-west through the Chilterns to the Midlands beyond, and

the M25 which provides circular access to all parts of London and the south. Important A roads providing wide physical links include the A12 and A120 and the A1(M), which has a similar route to the M1 but diverts towards the East Anglian Chalk and Bedfordshire Claylands NCAs.

Many watercourses feed in or flow from surrounding areas, often along courses incised into boulder clays or tills, for instance the Blackwater and Colne flowing from the South Suffolk and North Essex Claylands and the Ver and Lea from the westerly Chilterns NCA which flow into Hertfordshire before joining the Thames in inner London. These, along with others, form a series of river valleys draining south to the Thames and east to the North Sea and Thames Estuary, including the Roding, Wid, Chelmer, Roach and Crouch. Also notable is the Grand Union Canal, which runs from here through several other NCAs northwards to Birmingham.

Distinct areas

- Hertfordshire plateaux and river valleys
- Essex wooded hills and ridges
- London Clay lowlands
- Essex heathlands



River Mimram valley flood plain, Hertfordshire.

Key characteristics

- The landform is varied with a wide plateau divided by river valleys. The prominent hills and ridges of the 'Bagshot Hills' are notable to the north-west and extensive tracts of flat land are found in the south.
- Characteristic of the area is a layer of thick clay producing heavy, acidic soils, resulting in retention of considerable areas of ancient woodland.
- Areas capped by glacial sands and gravels have resulted in nutrient-poor, free-draining soils which support remnant lowland heathlands, although these are now small. Areas that have alluvial deposits present are well drained and fertile.
- The water bearing underlying Chalk beds are a main source of recharge for the principal London Basin Chalk aquifer.
- A diverse landscape with a series of broad valleys containing the major rivers Ver, Colne and Lea, and slightly steeper valleys of the rivers Stour, Colne and Roman. Numerous springs rise at the base of the Bagshot Beds and several reservoirs are dotted throughout the area
- The pattern of woodlands is varied across the area and includes considerable ancient semi-natural woodland. Hertfordshire is heavily wooded in some areas as are parts of Essex, while other areas within Essex are more open in character. Significant areas of wood pasture and pollarded veteran trees are also present.
- The field pattern is very varied across the basin reflecting historical activity. Informal patterns of 18th-century or earlier enclosure reflect medieval colonisation of the heaths. Regular planned enclosures dating from the Romano-British period are a subtle but nationally important feature on the flat land to the south-east of the area. In the Essex heathlands 18th- and 19th-century enclosure of heathlands and commons followed by extensive 20th-century field enlargement is dominant.
- Mixed farming, with arable land predominating in the Hertfordshire plateaux, parts of the London Clay lowlands and Essex heathlands. Grasslands are characteristic of the river valleys throughout. Horticulture and market gardening are found on the light, sandy soils of former heaths in Essex, particularly around Colchester, along with orchards, meadow pasture and leys following numerous narrow rivers and streams.
- The diverse range of semi-natural habitats include ancient woodland, lowland heath and floodplain grazing marsh and provide important habitats for a wide range of species including great crested newt, water vole, dormouse and otter.
- Rich archaeology including sites related to Roman occupation, with the Roman capital at Colchester and City of St Albans (Verulamium) and links to London. Landscape parklands surrounding 16th- and 17th-century rural estates and country houses built for London merchants are a particular feature in Hertfordshire.
- The medieval pattern of small villages and dispersed farming settlement remains central to the character of parts of Hertfordshire and Essex. Market towns have expanded over time as have the London suburbs and commuter settlements, with the creation of new settlements such as the pioneering garden city at Welwyn and the planned town at Basildon.
- Brick-built dwellings are characteristic from the late 17th century onwards. Prior to this dwellings and farm buildings tended to be timber built with weatherboarding, now mainly painted white but traditionally black or tarred, and whitewashed plaster walls.

Northern Thames Basin today

The Northern Thames Basin is a large and diverse landscape with a similar overarching character of agricultural land, interspersed with woodland, dissected by rivers and influenced by the urban areas of North London. It falls naturally into several distinct areas, shaped by their geology, topography and land use which are called: Hertfordshire plateaux and river valleys, Essex wooded hills and ridges, London Clay lowlands and the Essex heathlands

The Hertfordshire plateaux and river valleys to the north-west of the NCA are high, broad arable plateaux divided by wooded and pastured valleys which have a mainly rural feel with, on the whole, small developments. Rivers that drain the plateaux are the Colne, Ver and Lea and the soils are mainly underlain with London Clay, resulting in heavy, acidic, nutrient-poor soils with poor drainage; however, in the river valleys alluvial deposits provide fertile and well-drained soils. The area is underlain by extensive Chalk beds of the principal London Basin chalk aquifer, which provides the main source of water for London. Recharge of the aquifer largely occurs from the Chalk as water flows underground to London from the Chilterns, and water quality and availability within the aquifer are largely dependent on land management practices in the area.

While the plateaux are predominantly in arable use, the valleys by contrast contain areas of pasture and have a more intimate character, although some have been heavily modified by reservoirs, gravel workings, landfill sites and river realignments. The valleys contain all the main settlements within the area. Field boundaries are dominated by informal enclosure patterns of the 18th century, with thorn hedges relating to rationalisation and amalgamation of this pattern in the 18th and 19th centuries. It is a well-wooded landscape, especially to the east, with a number of ancient broadleaved woodlands including oak



Grazing marsh at Kings Meads Valley Meadowlands alongside the urban landscape of Hertford.

and hornbeam coppice. Isolated areas of remnant heathland survive within commons. The area retains a substantial legacy of funerary monuments and settlement sites associated with the prehistoric period and was intensively settled in the Roman times, with a number of major and minor towns (including St Albans and Welwyn) having a Roman origin. Today, a medieval pattern of small villages and dispersed farming settlement is central to the area's character and there is good survival of medieval timber-framed houses and barns, moated sites and small medieval castles. The 16th and 17th centuries saw the growth of rural estates and country houses for London merchants and the landscape parklands surrounding these houses are a particular feature of the

area today. The area merges with the outer London suburbs of Enfield, Barnet, Harrow, Hillingdon and Hounslow. It also contains many large towns including Watford, Hatfield, Hertford and St Albans which have developed as commuter settlements as well as the pioneering and influential garden cities of Ebenezer Howard at later Welwyn. Road and rail routes plus utility infrastructure are now dominant features of some parts of the area. To the far south the area is heavily urbanised as it becomes part of London, where housing, industrial areas and shops dominate. Green areas are restricted to city parks, grassed areas in front of housing developments and residents' gardens.

The Lea Valley within the area has been exploited for supplying London with water and for generating power for a wide range of industries, together with extraction of sand and gravel. This historic use has underpinned its current importance for wildlife. The Lower Lea valley, which lies in the south of the area and in the adjacent Inner London NCA, was heavily regenerated for the 2012 London Olympics, bringing ecological landscape, recreational and economic benefit.

The designations afforded to this area are Ramsar, which is an international designation for wetland habitats, and Special Protection Area (SPA), which is a European designation; also, within the Lea Valley and the surrounding areas there are many Sites of Special Scientific Interest (SSSI). The main reasons for the designations within the Lea Valley area are its importance as a wetland site; wetlands and reservoirs occupy a large part of the valley and support many important overwintering waterfowl. The species of particular importance are bittern, which over-winter in the reedbeds in the area which at peak times can support around 6 per cent of the UK's population, as well as gadwall and shoveler which also over-winter here (representing almost 2 per cent of their overwintering European population). There are also two important woodland

complexes within the area: Wormley and Hoddesdon Park Wood, which is a Special Area of Conservation (SAC) and Broxbourne Wood, which is a National Nature Reserve (NNR). Wormley and Hoddesdon Park Wood is an almost exclusively hornbeam woodland which has been managed through coppicing with oak standards. The ground flora supports bluebells and great wood-rush as well as important mosses. Broxbourne Wood is an ancient woodland which supports the rare butterfly purple emperor and also has historical value as the area has been managed since Roman and medieval times as a source of wood

The Essex wooded hills and ridges lie to the east of the Hertfordshire plateaux and river valleys to the north of the NCA. This area has several ridges where the soils are acidic and stony and have low fertility but are easily cultivated. This and the wet soils at the base of the Bagshot Beds limit the agricultural potential for the hill slopes, but farmland can be found in the lower-lying areas. The ridges of Epping Forest, Brentwood to High Wood, Thorndon to Billericay and Danbury to Wickham Bishops are dissected by the river valleys of the Roding, Wid and Chelmer. The Ter, Brain and Blackwater also contribute to the drainage of the area and Hanningfield Reservoir provides an area of open water.

This area is in the central part of the NCA, and extends roughly from Epping Forest in the west to Danbury in the east. It is a transitional landscape between the London Clay lowlands and the South Suffolk and North Essex Claylands NCA. It is formed by a series of hills and ridges created by the resistant Bagshot Sands which rise up above the clay lowland as at Epping Forest, Brentwood to High Wood, Thorndon to Billericay and Danbury to Tiptree. These well-wooded hills contain extensive areas of ancient woodland, remnant wood pasture and secondary woodland on commons as well as more recent plantations. These include the substantial wooded areas of Hainault Forest and Epping Forest, formerly Royal Forests, now managed for conservation and recreation.

Historically, settlement was sparse with scattered villages associated with the commons and areas of wood pasture. Today, settlement is dominated by large, 20th-century urban areas. The A12, the former Roman road connecting London with Colchester, is a major commuter route through the area.

Within this area Epping Forest is an important site for wildlife and as such has been designated as an SAC. The main reason that this site is important is the beech forests found here and the rare species that these support – rare mosses and also fungi and deadwood invertebrates owing to the high number of veteran trees present. Also found here are significant populations of stag beetle.

The London Clay lowlands lie south and east of the Essex wooded hills and ridges and are characterised by the heavy, acidic soils associated with this area, which is the dominant feature of the London Basin, although lighter soils can be found on some footslopes. The heavy soils are difficult to drain and easily become waterlogged. The area is drained by numerous rivers such as the Roach, Crouch and Blackwater, which merge to create the flat marshes to the east. The large expanse of open water at Abberton Reservoir, formed by the damming of the Layer Brook on its way to the Roman River, is a notable feature.

This area embraces the outer east London suburbs at Grays and Thurrock and extends eastwards to the Dengie Peninsula. It includes the town of Basildon.

This area is essentially a flat to gently undulating lowland landscape. Local variation is created by the Laindon and Hockley Hills, formed of the more resistant sandy Bagshot Beds which cap the clay.

The east of the area is characterised by a planned Roman landscape with a rectilinear pattern of fields which is a nationally important but subtle feature



Wet heathland, acid grassland and coppiced ancient woodland at Bricket Wood Common, Hertfordshire.

of the landscape today. The heavy clays were difficult to work and remained in pasture; however, during the 1950s and 1960s the land was improved so that arable is now also a dominant land use. By contrast, the hills around Laindon, Hockley and Rayleigh are relatively well wooded. In addition, 19th- and 20th-century plantations and regenerated, formerly urbanised plotland landscapes add a further wooded aspect to parts of the area. The landscape today has an urban character, including the expanded resort of Southend, the 1950s planned

town of Basildon and extensive 20th-century commuter settlements such as at Laindon and Rayleigh. Large areas of recreational land including parkland, golf courses and horse paddocks serve the urban population.

This area has many important wetland sites including Abberton Reservoir (designated as a Ramsar site and SPA) and also two reservoir areas recognised as SPA, the Crouch and Roach Estuary and Blackwater Estuary: however, only a small proportion of the two estuaries is found in this NCA with the majority falling within the Greater Thames Estuary. Abberton Reservoir is a significant site as it supports many important overwintering waterfowl such as golden plover, gadwall, shoveler and teal, as well as breeding cormorant, and also qualifies as a wetland of importance as it supports more than 20,000 waterfowl. The Crouch and Roach Estuary is an important site for overwintering dark-bellied Brent goose and the Blackwater Estuary (which is also an NNR) is important for overwintering avocet, golden plover, hen harrier, dark-bellied Brent goose, redshank and breeding little tern: it too is recognised as a wetland of international importance because it supports more than 20,000 waterfowl.

The Essex heathlands lie north-east of the London Clay lowlands and Essex wooded hills and ridges, in the north-east of the NCA. The geology of the area is predominantly sands and gravels, which were deposited by the Thames as it changed its course over time to its present location. Around the Tendring area deposits of wind-borne silty loam overlie the sands and gravels but overall the soils are light and free draining. The area is relatively flat with contrast provided by the steep-sided slopes of the Stour, Colne and Roman river valleys which, along with their tributaries, drain the plateau and are eventually discharged into the North Sea.

The east of this area is broadly bounded by the Stour Estuary to the north and the Thames Estuary to the south and east, and covers the land around

Colchester and the Tendring plain. It is separated from the North Sea and Thames Estuary by a narrow strip of coastal marshes which form part of the Greater Thames Estuary.

The area consists of a broad, sandy plateau created by ancient river deposits from the Thames. Historically it was dominated by extensive heaths and commons, although these are now restricted to isolated fragments of heath and scrub within an intensively farmed and largely arable agricultural landscape. Agriculture includes improved grassland and arable fields as well as distinctive areas of horticulture and market gardening associated with the light, sandy soils of former heaths. Orchards are a feature around Colchester.

A pattern of small but intricate creeks and valleys breaks up the plateau edges where the land falls to the Thames Estuary along the coast and extends the coastal influence inland. The narrow river valleys which incise the plateau also create areas of contrasting enclosed landscape, with abundant woodland and meadows, some with wider flood plains and wetland vegetation. Much of the woodland is ancient; however, in general the plateau has an open, treeless character owing to the loss of field boundaries.

Vernacular buildings are constructed of timber, with either weatherboarding or whitewashed plaster. The principal settlement is Colchester, the walled Roman capital and England's oldest town, dating from 49 AD.

Within this area is Hamford Water, designated as a Ramsar site as well as an SPA and SSSI owing to the important waterfowl that use it. Many species over-winter here, including avocet, golden plover, ruff, black-tailed godwit, grey plover, ringed plover and teal – up to 25 per cent of the UK population of overwintering avocet has been recorded here. In addition, little tern use it

as a breeding site and the area is considered to be a wetland of international importance as it supports more than 20,000 waterfowl. Part of the Colne Estuary is in this area (although the majority of it falls within the Greater Thames Estuary NCA); this is also a Ramsar site and SPA, and of national importance for geology. Similar species are found here to those found in Hamford Water, and in addition overwintering hen harrier, dark-bellied Brent goose and redshank. This area is also considered a wetland of international importance and includes a small part of the predominantly pastoral character of the Dedham Vale AONB. St Osyth marsh is an important site for salt marsh morphology dating back around 4,000 years, while geological exposures at East Mersea show important deposits beneath gravels which are attributed to the Thames and Medway system and are of considerable importance in Pleistocene studies.

The whole area is a combination of countryside mixed in with urban areas, with important habitats and species, especially woodland and wetland habitats and associated species. The rural area acts as a recreational opportunity for those living in the surrounding towns and cities and the urban areas offer work and recreation opportunities for those living in more isolated villages and settlements in the rural environment. There is strong historical association throughout the area owing to its close proximity to London and the Roman occupation of Colchester and the links that this creates within the area as a whole. Dedham Vale is strongly associated with the artist John Constable whose paintings were inspired by the landscape.

The landscape through time

The NCA is the northern part of the London Basin, a broad, concave fold which opens out towards the East Coast. This structure means that the oldest rock strata are at the periphery, with younger deposits towards the centre. Chalk deposited in the tropical seas of the Cretaceous Period (65–95 million years ago) underlies the area and forms the bedrock of adjacent NCAs, extending beneath London and providing the major aquifer for the capital. The folded structure, a syncline, developed some 20–40 million years ago during the Tertiary Era (2–64 million years ago) at the time that the Alps were being formed in southern Europe. During this period of uplift, the area became dry land and rivers developed, including the proto-Thames along a course to the north of its present location. Overlying the chalk is a series of sands and mudstones (Reading Beds) deposited during the Tertiary Era by ancient river systems that drained into the basin. The thick layer of London Clay which characterises this NCA today was laid down as a sequence of fossiliferous, shallow marine sediments under semi-tropical seas some 55 million years ago. Overlying the London Clay are sands and clays of the Bagshot, Barton and Bracklesham Beds.

The diverse geology has considerable influence on the landscape. The London Clays are heavy and typically difficult to work, resulting in the retention of pasture and considerable areas of ancient woodland. The lighter, sandy soils of the Bagshot Beds are likely to have remained relatively open and unwooded since prehistoric times and areas of remnant heath are a feature, particularly within the Essex heathlands and wooded hills. In Essex, the harder rocks of Bagshot Beds deposits form distinctive features, creating low hills and ridges such as at Danbury Hill, rising to a high point of 116 m.

The Quaternary deposits which overlie the clay provide an insight into Britain's most recent geological past. The Anglian ice sheet which reached

the outskirts of London approximately 500,000 years ago (evidenced at Hornchurch SSSI) advanced to the rim of the basin, leaving a series of glacial sands, gravels and clays and moving the course of the Thames southwards to its present location. Quaternary deposits have yielded artefacts illustrating early human presence (approximately 300,000 years ago) in the Thames Basin and more recently the evolution of prehistoric society. By the time that Britain was cut off as an island during the Holocene, humans had settled along the margins of the Thames and its tributaries. The light, sandy soils of the Essex heathlands to the east are particularly rich in buried archaeological remains associated with prehistoric and Roman occupation. Funerary monuments and settlement sites visible as cropmarks and earthworks are also a feature of the Hertfordshire plateaux and valleys and were extensively cleared and occupied in the prehistoric period. Here, the limited survival of coaxial field systems potentially of bronze-age origin is highly significant.

Roman occupation has left a significant impact on the area. A major road, now the A12, connected the Roman capital at Colchester to London. Other major and minor Roman towns and cities include St Albans and Welwyn and there are extensive villa estates, notably in the west of the area (in Hertfordshire). Also in Hertfordshire, the distinctive settlement pattern of 'homestead moats' aligned with the grid pattern is thought to be influenced by Roman estate management techniques. The London Clay lowlands are also characterised by planned landscapes created during the Roman period, forming a still distinct rectilinear pattern of enclosure on the Dengie Peninsula and in the area between Thurrock and Wickford. By comparison, the central part of the NCA (the Essex wooded hills) was relatively sparsely settled. Orchards were established around Colchester, as well as a significant area of meadow pasture and leys following the numerous narrow rivers and streams.



Traditional medieval timber-framed houses in Colchester, Essex.

Throughout the Northern Thames Basin, settlement is essentially based on a pattern of dispersed nucleated villages and farming settlements established in the medieval period. Post-Roman decline in Hertfordshire is evident in the number of medieval place names and settlement patterns which imply re-colonisation and clearance of a wooded landscape and late-medieval timber-framed houses and moated sites are a distinctive feature. In the Essex heathlands the dispersed settlement pattern was established within extensive tracts of heathland. In the London Clay lowlands some larger villages and small towns developed in the medieval period associated with local centres of civil

or religious authority. The exception to this dispersed pattern is in the Essex wooded hills where settlement remained sparse in the medieval period and was associated with the extensive commons or management of wood pasture and other resources belonging to medieval monastic houses.

The 16th, 17th and 18th centuries saw the growing influence of London, particularly in Hertfordshire, with the growth of market towns and rural estates and country houses for London merchants. Profitable farming conditions saw the demise of much medieval parkland in the 17th and 18th centuries, alongside the growth of substantial farming estates for the London merchants, rising nobility and gentry. The remaining associated parkland landscapes form a distinctive feature of the area today, particularly within the Hertfordshire plateaux area.

Industries based on agricultural produce (such as malting and brewing, paper making, hat making and tanneries) contributed to the prosperity of the market towns and developed further in the 19th century, aided by the growth in communications. This also stimulated the development of commuter settlements in the 19th and 20th centuries, and the urbanisation and expansion of existing towns and villages. The creation of new settlements is a particular feature, with the pioneering garden city at Welwyn and the planned 1950s town of Basildon. The edge of London has also expanded outwards with suburbs now embracing former villages. Communication routes – motorways (the M1, A1(M) and M11), main roads and railways running north–south connecting to London, plus the M25 radial route – are dominant features.

In the 1970s Dutch elm disease transformed many parts of the landscape, with the loss of tree and woodland cover, and the area continues to change with pressure for housing and industrial growth associated with, for instance,



Mixed coppice ancient woodland at Norsey Wood near Billericay, Essex.

the Thames Gateway, Haven Gateway and other strategic growth points such as Chelmsford, identified in the East of England Improvement Plan, the Lea Valley regeneration area (including the Olympics legacy) and changes in the agricultural landscape.

Ecosystem services

The Northern Thames Basin 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 Northern Thames Basin NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision:** This is a predominantly arable landscape with arable crops covering 53 per cent of the area – primarily wheat and oilseed rape. The area also includes a sizeable sheep flock (approximately 18,800 breeding ewes in 2007) but relatively few cattle (only approximately 2,600 breeding dairy cattle and 3,200 breeding beef cattle), all of which have declined in number since 2000.
- **Timber provision:** The area only has 6 per cent woodland cover. This resource is unevenly distributed and some parts of the NCA have a relatively high woodland cover. The main areas of commercial timber are the coniferous plantations situated on former lime tree woods in the river valleys of Hertfordshire; these cover some 0.7 per cent of the total area of the NCA.
- **Genetic diversity:** Remnant traditional orchards provide a genetic stock of old apple varieties, many of which are no longer commercial. There are also rare animal breeds associated with the area including the British Saddleback Pig (which is partially bred from the Essex Pig), White Park Cattle, Red Poll Cattle, Jacob Sheep, Bagot Goat, Hackney Horse, Hackney Pony, shire horses and British Percheron Horse.

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

- **Climate regulation:** Soils, woodland and hedgerows are likely to be significant stores of organic carbon across this area.
- **Water availability:** The Chalk which underlies the west of the area is extensively abstracted for drinking water in the NCA and provides a main source of recharge for the principal aquifer supplying Inner London.
- **Regulating soil erosion:** The sandy soils of the Essex heathlands and hills and ridges are susceptible to erosion if high risk crops are cultivated on sloping ground and in dry summers will become increasingly prone to wind erosion if they are left exposed. The restoration of hedgerows across the landscape can reduce the scale of wind erosion.



The River Lee near Hertford.

- **Regulating soil quality:** This NCA has a range of soil types and the condition of these soils varies significantly. Within the area as a whole more than 50 per cent of the land is classified as excellent to good/moderate quality, which supports a wide range of agricultural and horticultural crops.
- **Regulating water quality:** The rivers flowing south and east from the chalk strata into the Thames and to the coast are of variable ecological quality. While most are considered to be of moderate quality, parts of the Lea are of poor quality as are some of the smaller rivers, such as the Rib. These classifications are based on results from the Environment Agency within their work under the European Water Framework Directive. Land management practices within the NCA will have a major impact on water quality in the underlying aquifer.
- **Pollination:** The areas of semi-natural habitat – heathlands, grasslands and woodland edges in parts of Essex and Hertfordshire – provide important habitats for pollinating insects. The extensive agricultural lands can provide habitats in the form of hedgerows, edges of farm tracks and ‘set aside’ areas. This in turn will be beneficial for food production through pollination of food crops, particularly oilseed rape, through pollinating invertebrates.
- **Pest regulation:** The presence of semi-natural habitats such as grasslands, woodlands, road-side verges and uncut farm tracks can provide overwintering habitats for beneficial predatory invertebrates which will help to control populations of many pest species. An example of this is the Carabidae family of beetles which feed on a number of pest species. Careful management of land to encourage such species can reduce the need for chemical control measures.

Cultural services (inspiration, education and wellbeing)

- **Sense of history:** A strong sense of history is captured in the ancient

woodlands and trees of the area – the Broxbourne Woods and Epping Forest – and also the built environment, including significant estates.

- **Recreation:** There is a strong appreciation of the local landscape as a ‘green lung’, offering opportunities for active and passive recreation away from the Greater London conurbation, and a ready recognition of the coast as offering a nearby visitor destination. The easy accessibility of the countryside and coast is a very important aspect of the lives of local residents.
- **Biodiversity:** The diverse range of semi-natural habitats present in the NCA, which includes 3 SAC and 3 SPAs, include ancient woodland, lowland heath and floodplain grazing marsh and provide important habitats for a wide range of species including great crested newt, water vole, dormouse and otter. The area is also important for wetland birds, especially the Ramsar wetland sites of Lee Valley, Hamford Water and Abberton Reservoir.
- **Geodiversity:** The area has a clear identity created by the geodiversity underpinning the diverse landscape. The underlying sediments themselves contain a record of ancient landscapes and climates. There are 20 geological SSSI in the area and 3 Local Geological Sites which are of local and national importance. These sites preserve important deposits of chalk stratigraphy and evidence for the formation of the London Clay as well as conserving several key geomorphological features. The majority of sites within this NCA, however, preserve evidence for past glaciations and the evolution of the Thames during the Quaternary. These sedimentary deposits and the fossils contained within them represent significant records of climate and environmental change that provide an important context for our understanding of and insights into the potential impacts of future climate change on our landscapes. Several sites also preserve important evidence for early human occupation of the area dating back around 300,000 years.

Statements of Environmental Opportunity

SEO 1: Manage rivers and river valleys to protect and improve water quality and help to alleviate flooding in the downstream urban areas, while also helping to improve aquifer recharge and provide a sufficient store of water to meet future need, especially with predicted climatic changes. Conserve the riparian landscapes and habitats, for their recreational and educational amenity for their internationally significant ecological value.

For example by:

- Managing and enhancing the river valleys and wetland habitats for the important habitats and species that they support, their geodiversity, landscape and recreational value, and to increase water storage capacity to reduce flood events in downstream urban areas.
- Sustainably managing the water resource including watercourses and aquifers, by implementing catchment-wide land management practices to help reduce pollution and aid aquifer recharge.
- Maintaining, enhancing and increasing the network of hedgerows along river valleys, especially in flood plains, to act as water stores which will absorb excess water during high rainfall, slowly release water in drier periods and reduce wind evaporation on fields in drier periods.
- Enhancing and creating riverside buffer strips of natural vegetation, including the conservation and planting of a new generation of riverside willows that will reduce overland run-off and help to minimise the deposition of soil and silt in channels and stop nitrates entering the watercourse in order to prevent adverse effects on aquatic life.
- Creating reedbeds in areas of potential pollution including along roads and near road bridges and agricultural drainage areas. This will help to improve urban diffuse pollution.
- Utilising semi-natural habitats to replace current engineered flood management. Current flood management will be insufficient to counteract future flooding, so allowing natural processes to reduce water levels in priority areas is the most sustainable alternative. Allowing rivers to flood naturally will also increase biodiversity and enhance geomorphology, wetland habitats and riverine character.
- Restoring river valley mineral sites to wetlands and washlands while enhancing geodiversity and archaeological interest.
- Raising awareness within the general public as to how they can individually help to reduce water waste and prevent contamination.
- Encouraging landowners to store water for individual usage, from using water butts for small gardens to larger storage systems for arable land and golf courses.
- Growing crops that are more resilient to drought so that less irrigation is needed in drier periods when water availability decreases.
- Restoring and improving the natural geomorphology of rivers in the area including urban rivers so that the quality of not only the water but also the river ecology as a whole improves by reducing pollution, sedimentation, invasive species etc; reducing the prolificacy of invasive aquatic and marginal plant species, including floating pennywort and Himalayan balsam, which cause waterways to become blocked, increase sedimentation, reduce biodiversity and affect movement of aquatic life as well as recreation activities along watercourses.

SEO 2: Manage the agricultural landscape and diverse range of soils which allow the Northern Thames Basin to be a major food provider, using methods and crops that retain and improve soil quality, water availability and biodiversity.

For example by:

- Retaining the overall agricultural diversity with areas of arable land, horticulture and pasture which are so important for food provision in the area, while encouraging sustainable management to protect agricultural soils and enhance biodiversity. Encouraging the use of sustainable farming methods to enhance soil quality, such as maintaining vegetation cover, reducing tillage and encouraging the use of organic manures and composts. This will help to retain organic matter, which is vital for productive soils.
- Managing, enhancing and, where appropriate, expanding hedgerows and grass strips as field boundaries as these help to bind the soil, reducing soil erosion, while also providing habitats for pollinating insects as well as various farmland birds, mammals and invertebrates. Hedgerows will also create habitat corridors, connecting habitats and so allowing wildlife to disperse and increase its range, creating a more diverse landscape.
- Encouraging a reduction in compaction of the clay-based soils in the area which can damage their structure and drainage potential and reduce aquifer recharge. This includes reduced poaching from livestock and careful use of heavy machinery.
- Encouraging the management of the heathland soils to prevent wind and water erosion using hedgerow and tree boundaries to reduce overland run-off and to act as a wind shield. These soils are more prone to erosion than the more clay-based soils and are usually of high quality in terms of arable usage.
- Encouraging improvements to water management within agricultural land using boundary features such as hedgerows and grass buffer strips to store water during wet periods and retain it in drier periods.
- Adopting land management practices, including the use of buffer strips next to watercourses, to reduce diffuse pollution from agricultural sources, prevent contamination of groundwater and safeguard future water quality and availability.
- Improving biodiversity in the area by putting aside less productive land and creating semi-natural habitats such as wildflower meadows and grasslands. The promotion of agri-environment schemes can help to establish these opportunities

SEO 3: Protect and appropriately manage the historic environment for its contribution to local character and sense of identity and as a framework for habitat restoration and sustainable development, ensuring high design standards (particularly in the London Green Belt) which respect the open and built character of the Thames Basin. Enhance and increase access between rural and urban areas through good green infrastructure links to allow local communities recreational, health and wellbeing benefits.

For example by:

- Conserving historic features in the landscape with heritage interest and improving the condition of heritage assets through appropriate measures, and seeking to reduce conflicting or unsympathetic management regimes.
- Conserving and interpreting archaeological earthworks and sub-surface archaeology while recognising the high potential in this landscape for undiscovered remains.
- Preserving and enhancing current public access sites including nature reserves, common land, country parks and public footpaths and rights of way to attract the wider community.
- Creating better access to the countryside with an increased number of public footpaths and rights of way so that more of the area is open access. Enhancing current public access paths would also be beneficial to make the experience of the countryside more inviting and enjoyable.
- Restoring the connectivity of key habitats as well as expanding and creating new habitats which will maintain and enhance their attraction for visitors. Also, working to increase species diversity and density to increase this attraction for the community.
- Preserving the open landscape, enhancing geodiversity and biodiversity, for example the iconic species and habitats that attract visitors, to preserve their appeal to the wider community.
- Maintaining and enhancing the status of Sites of Special Scientific Interest, Special Protection Areas, Special Areas of Conservation, National Nature Reserves and Ramsar sites. This will preserve the character of the landscape, protecting and enhancing the sense of place.
- Increasing awareness and raising understanding within the community of the natural environment to improve their appreciation of their landscape so as to help to enhance their experience. This will also help to instil a sense of place.
- Planning for future pressure from urban expansion and urban-related development, major roads and other infrastructure as a result of the expansion of Stansted and Luton international airports (impacting from adjacent NCAs) and the impact of strategic growth in and around the NCA, such as at the Thames and Haven Gateways, Chelmsford and Southend, and the regeneration in the Lea Valley. Seeking measures to help to implement the All London Green Grid frameworks in order to ensure that associated design standards are of a high quality and pay due regard to the natural environment for the benefit of people and wildlife.
- Planning for a new vision of agricultural landscapes in areas of significant planned growth such as within the Thames Gateway, Haven Gateway and M11 corridor, including, potentially, the exploration of new forms of community food growing and community land ownership, providing a 21st-century interpretation of the plotlands of the 1920s and 1930s that are characteristic of this NCA.
- Ensuring positive management of land that may be developed in the future to preserve the character of the area and not adversely affect the rural areas that provide many resources, including food provision, carbon sequestration and recreation for the rural and urban communities.

SEO 4: Manage and expand the significant areas of broadleaf woodland and wood pasture, and increase tree cover within urban areas, for the green infrastructure links and important habitats that they provide, for the sense of tranquillity they bring, their ability to screen urban influences and their role in reducing heat island effect and sequestering and storing carbon.

For example by:

- Promoting the establishment of a coherent and resilient network of treescapes (native woodland, wood pasture, parkland, coppice, scrub, field trees and hedgerows) through expanding and linking existing woodland with areas of new planting.
- Managing the area's diverse range of historic woodlands, veteran trees and wood pasture and parklands to enhance landscape character and safeguard their biodiversity value while seeking opportunities to enhance access.
- Expanding current woodlands to create a greater resource and re-introduce coppicing and other management back into woodlands so as to make wood available to be sold commercially.
- Working within established management plans to ensure that the viability of the woodlands is not affected and that biodiversity is maintain or enhanced.
- Creating new woodlands, taking into account natural processes and bringing them into wood production management. Sensitively incorporating them into and around new developments to enhance landscape character. Community woodlands should be maintained and increased where possible for this purpose as well as for recreation.
- Creating new woodlands around or near to urban areas, which will, through carbon sequestration, help to counteract the carbon that is produced. Woodlands within urban areas will help to reduce the heat island effect.
- Incorporating woodland rides and paths within woodlands to allow for public access but also to create a variety of habitats within the woodlands which will increase biodiversity.
- Maintaining and enhancing woodland habitats which support important invertebrate species such as stag beetles, rare fungi and priority species such as dormouse. Ancient woodlands also support ground flora such as bluebells.
- Maintaining the diverse appearance of the landscape and shield developments and infrastructure from the wider landscape. This character should be maintained within any future developments that are built.
- Managing, restoring and re-linking areas of remnant lowland heathland and acid grassland found on areas capped by glacial sands and gravels, notably within the Essex heathlands and wooded hills and ridges.
- Conserving characteristic landscapes linked to the arts, such as Dedham Vale in the north- easternmost corner of the NCA (the inspiration for Constable), and the rich heritage of designed parklands associated with estates (particularly in the Hertfordshire plateaux and river valleys and the Essex wooded hills and ridges).

Additional opportunity

Continue to utilise the mineral resource as appropriate, ensuring screening and restoration plans are in place to protect landscape assets. Restore, enhance and manage previous mineral sites as suitable habitats or sites of key geological importance to demonstrate the significance of the rich mineral resources in shaping the area's landscape, and their potential as recreational and ecological assets of the future.

For example by:

- Appropriately utilising the minerals which are a much-needed resource in the area, with the continuing demand for new housing and other building projects. Ensure long term restoration plans seek landscape and ecological benefit so this resource can provide a source of revenue and jobs for the area as well as an opportunity to enhance our knowledge and awareness of geodiversity, and provide new assets for the community in the long term
- Restoring previous extraction to habitats that are appropriate for the area to improve the network of semi-natural habitats, and the recreational and educational opportunities for local communities.
- Provide appropriate access and interpretation to important geological sites once mineral extraction is completed to use this exposed resource to educate and inform people of the geological and geomorphological features.
- Encouraging an understanding of the interrelationships between the geological and archaeological heritage of the area.
- Ensuring appropriate management, educational access and interpretation of important geological and above and below ground archaeological features and sites throughout the area.