National Character Area profile:

76. North West Norfolk

Supporting documents

NATURAL ENGLAND

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Introduction

As part of Natural England's responsibilities as set out in the Natural Environment White Paper[1], Biodiversity 2020[2] and the European Landscape Convention[3], 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.

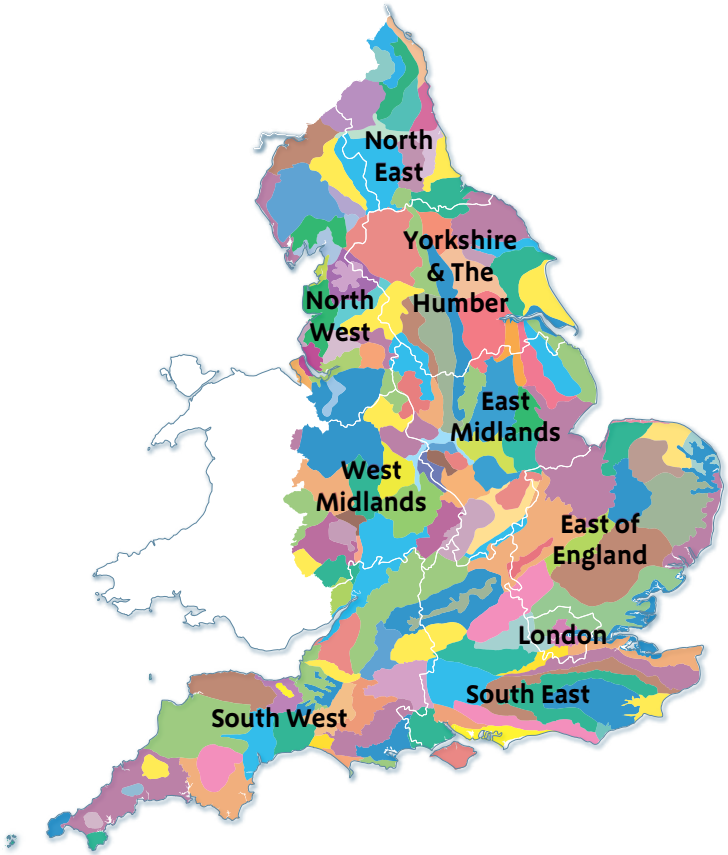
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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

North West Norfolk National Character Area (NCA) has a very open, rolling topography which contrasts with the surrounding coastal, fenland and other lowland NCAs. It extends from Downham Market on the edge of the Fens east towards Castle Acre, and skirts Fakenham before sweeping eastwards into a narrowing triangular area abutting the western edge of the Cromer Ridge.

This NCA is very important for agriculture with a large-scale arable and grassland landscape comprising extensive arable cropping and some areas of mixed farming, – the dominant livestock type is pigs. The name 'Good Sands', often applied to the eastern half of this area, derives from the fertility of the versatile light soils which distinguish the area from the low-fertility sands of Breckland to the south. Many of the villages are centred on greens or ponds and built from local vernacular materials – carstone and chalk in the west with flint becoming characteristic further east, reflecting the underlying geology. Aquifers underlying the NCA and extending well beyond its boundaries provide water both locally and regionally.

Key sites of conservation interest include internationally important heathland areas and acidic mire systems supporting equally important populations of natterjack toad and nationally important populations of nightjars. There are important peat deposits in many of the valley systems in the south and west of the NCA. There are several biological, geological and mixed-interest Sites of Special Scientific Interest (SSSI) in the NCA but, while The Wash and the sea off the north Norfolk coast are of international importance for wildlife, only small areas of the NCA have international designations. Several inland sites, including Dersingham Bog, are designated internationally and also nationally as National Nature Reserves and SSSI. Twenty per cent of the NCA is within the Norfolk Coast Area of Outstanding Natural Beauty.

The history of North West Norfolk NCA is of great interest to the historian and the general public alike. The royal estate at Sandringham and the country houses such as Holkham Hall, with their associated estates, are important for tourism and many pilgrims visit the shrines dedicated to Mary at Walsingham. The many impressive and significant designated heritage assets within the NCA also include more than 130 Scheduled Monuments about 180 Grade I or II* Listed Buildings, two grade I and one grade II* Registered Park and Garden. Many tourists visit and stay in Hunstanton, Heacham, Snettisham and Dersingham.

The main pressures on the NCA arise from increased tourism, traffic and development – especially along the boundary with the North Norfolk Coast NCA and from King's Lynn to Hunstanton where the A149 carries a great deal of traffic.

Click map to enlarge; click again to reduce.

Statements of Environmental Opportunity

Many local villages are set around village greens or ponds.

- **SEO 1:** Protect and manage the nationally important agricultural landscape and plan for it to become more resilient to the likely impacts of climate change while seeking to enhance landscape, habitat integrity and connectivity for the benefit of wildlife and managed access for people.
- **SEO 2:** Conserve, enhance and increase public awareness of the distinctive historic and rural landscape and local towns and villages, and improve public awareness, enjoyment and access to the NCA's heritage and distinctive geology.
- **SEO 3:** Protect and appropriately manage the woodland resource, combining commercial forestry and fuel production, expanding and improving connectivity between broadleaved woodlands for the benefit of wildlife, strengthening landscape character, and improving recreational opportunities.
- **SEO 4:** Protect and manage the unique geological and biological resource of the NCA and plan for the restoration of semi-natural habitats and improved connectivity where opportunity arises to help make the landscape and its important species more resilient to future pressures for change.

Description

Physical and functional links to other National Character Areas

North West Norfolk National Character Area (NCA) is a gently-sloping plateau which briefly touches the coastline around Hunstanton and also shares boundaries with five other NCAs: Central North Norfolk, North Norfolk Coast, Mid Norfolk, The Brecks and The Fens. This NCA includes 20 per cent of the Norfolk Coast Area of Outstanding Natural Beauty (AONB) along its northern and western sides, and borders the North Norfolk Heritage Coast. The broad transitional zone at the east of this NCA has characteristics of both north-west and central Norfolk but lacks the distinctive open character of the former. The transition zone to the south is relatively narrow where the area abuts The Fens and The Brecks NCAs.

The Chalk which forms the plateau extends out eastwards and southwards under the surrounding NCAs where it plays a major part in shaping their character, while the sandstones and clays that form the ridge at the west of the area continue southwards.

While the coastal strip to the north of the coast road – the North Norfolk Coast NCA – is very different in character, North West Norfolk NCA does briefly meet the sea at Hunstanton Cliffs where excellent views across The Wash and to Skegness in the Lincolnshire Coast and Marshes NCA are afforded and from where reciprocal views are offered. Its rivers and watercourses provide further linkages with the surrounding NCAs: the River Burn rises in the North West Norfolk NCA and, along with the River Stiffkey, flows through the North Norfolk Coast NCA before discharging into the North Sea. Several tributaries, large and small, rise and flow through this NCA to join with the Babingley River and the Nar and the Ouse close to King's Lynn. Important chalk and sandstone aquifers underlie the NCA and extend well beyond its boundaries.

The busy A149, the main road into and out of the NCA, curves around the west and northerly extent of the area, with the A148 running through east–west. The A47, running from Norwich to King's Lynn, also cuts through the south of the area.

The Peddars Way and Norfolk Coast Path National Trail route runs through the NCA from Castle Acre to the sea at Hunstanton and along the north Norfolk coast where it weaves along and between the North Norfolk Coast NCA and the North West Norfolk NCA.

The area is adjacent to the internationally important Special Protection Area (SPA)/ Special Area of Conservation (SAC)/Ramsar sites of The Wash and the North Norfolk Coast.

The Coast Path National Trail links North West Norfolk to other NCAs.

Key characteristics

- Open, rolling arable landscape, accentuated by the large geometric field pattern of the 18th century and offering frequent long views.
- Extensive arable cropping and some areas of mixed farming. Fertile and versatile light soils known as the 'Good Sands' in the east. The arable habitats support nationally important assemblages of farmland birds, including grey partridge and turtle dove.
- The shallow dip slope of a low Chalk escarpment containing important aquifers slopes west to east, separated from the coastal strip along The Wash by a distinctive scarp slope.
- Smaller-scale, intimate pastoral character within river valleys.
- Significant belts of mixed woodland and plantation and some remnant heath on the Greensand in the west.
- Dominant pattern of large-scale rectangular fields, with well-trimmed hawthorn hedges and mature hedgerow trees (predominantly oak and beech) away from the northern area. Scots pine rows are striking field boundary features in the west.
- Rivers are prominent in the west and north of the area where they contribute to a more intimate, pastoral character, with small areas of flood plain grazing marsh.
- Evidence of rich archaeological remains and surviving heritage features include barrows, Roman villas and the Roman fort at Blakeney, and medieval moated sites, as well as the ruins of a significant number of priories or abbeys.
- Small villages and outlying farms with flint, usually clay-tiled, buildings but some built from distinctive orange sandstone (carstone) and sometimes chalk on the western escarpment, with clunch – an impure variety of chalk - sometimes used further east.
- Large estates and country houses, often concealed by tree belts fringing parkland, bring a unified and well-managed quality to the landscape – such as Holkham, Sandringham, Houghton and Raynham.
- There is a dispersed settlement pattern, often clustered around a green, common or pond, and linked by a few roads, straight and often with very wide verges, especially in the northern part of the area. Some of the villages attract large numbers of tourists and, in the case of Walsingham, pilgrims.
- The Peddars Way and Norfolk Coast Path National Trail is well used by walkers; the adjacent north Norfolk coast attracts many tourists from far and wide.

North West Norfolk today

Shaped physically and economically by its underlying geology and its soils, North West Norfolk is a big, rolling landscape with frequent long views. It is very open, relatively high and remote, dipping to the east and offering long views, with a contrasting smaller-scale and more intimate landscape within the river valleys.

Wolferton Station.

The area bounding the north Norfolk coast and the area between Castle Rising and Dersingham are designated AONB because of their outstanding beauty, diversity, cultural heritage and scientific importance, with Dersingham Bog and Wolferton and Castle Rising villages inland being highlights. Sunsets over The Wash are spectacular; Hunstanton and the surrounding area are the only places in the east of England where the sun can be seen setting over the sea.

The ridge on the western edge of the area is marked by the villages of Heacham, Snettisham and Dersingham which, inter alia, provide a focus for visitor accommodation. The landscape rises above the Fens in the west due to the underlying erosion-resistant Cretaceous sandstones which are backed to the east by a higher scarp of Chalk rock. This gives rise to a rolling topography, where arable cultivation with some grassland dominates. The 'Good Sands' – light, sandy soils – in the east support important commercial agriculture, with more than two-thirds of the farmed area used for arable farming. Pig farming is very important locally, with smaller numbers of sheep and cattle.

The cultivated land, with its large rectangular fields bounded by trimmed hawthorn hedges, is interspersed with large belts of mixed woodland. There are several large – and important – historic estates with extensive woodlands, plantations and shelterbelts of Scots pine; these are particularly characteristic along the western fringe on the Greensand 'uplands'. The settings of the great houses generally remain well wooded, although parkland has seen significant arable conversion (a loss of about 24 per cent) since the First World War. A major issue is the proliferation of rhododendron.

Other than Hunstanton, there are no large towns within the NCA. Villages are widely spaced (4–5 miles apart), and often set around large village greens or ponds. In an East Anglian context this is 'upland', with a high, remote quality, a dispersed settlement pattern, straight roads with wide verges and well-trimmed hawthorn hedges bounding large, rectangular fields. Sandringham and Holkham are major visitor attractions and Walsingham an important pilgrimage centre.

The River Nar, which rises in the Mid Norfolk NCA, runs into the Great Ouse with the Babingley River draining into The Wash to the north of King's Lynn; the River Stiffkey runs out to the North Norfolk Coast NCA at Morston near Blakeney. Regionally important chalk and sandstone aquifers underlie the NCA and extend well beyond its boundaries.

In terms of terrestrial priority habitats, there are large belts of mixed woodland, including small areas of ancient woodland north-west of King's Lynn, and there is some remnant heath and mire mainly on the western side of the NCA. Dersingham Bog is a Site of Special Scientific Interest (SSSI) of major importance for its lowland heath, and it supports a nationally important population of nightjar. There are small areas of flood plain grazing marsh along the River Nar and the (minor) River Tat. One of the UK's last inland heath colonies of the natterjack toad can be found at Syderstone Common, west of Fakenham. North West Norfolk NCA is bounded by coastal/marine sites of international importance: The Wash and North Norfolk Coast are designated as SPAs, SAC and Ramsar sites. Dersingham Bog and Roydon Common share these last two designations. The NCA has very important assemblages of farmland birds including grey partridge and turtle dove.

Several important elements and ruins contribute to a sense of deep history, including barrows, Roman villas and the Roman fort at Brancaster, and medieval moated sites. There is a Norman 'bastide' at Castle Rising and the remains of a significant number of priories with scheduled examples at Pentney, Shouldham, Marham, Flitcham, Coxford, Binham, Wormgay, Creake and Blackborough. The Snettisham Hoard, or Snettisham Torc, is a series of finds of gold jewellery with more than 70 complete torcs (metal collars or armbands). The Roman Peddars Way is now part of a National Trail, and very popular with walkers. A sense of the more recent history of the area comes from the remodelled and reused railway stations at Wolferton and Walsingham – the latter is now a Russian Orthodox church, one of the more exotic elements of the shrine complex in the village.

Buildings of brick and flint with clay-tiled roofs form the majority of the built environment, creating a unity and a strong vernacular style. Many buildings in the west, along the scarp, are richly textured with orange carstone and sometimes chalk, giving a vibrant colour range to the most ordinary walls. Clunch – an impure chalk – is used in addition to the dominant flint and red brick in more eastern parts.

This area is one of the largest producers of silica sand (a highly specialised mineral present in only a handful of localities in England), used for glass-making, in the country; it is quarried from sites in the Leziate–Bawsey–Middleton–East Winch area.

Woodland at Dersingham.

This NCA has comparatively few but very straight roads, especially in the northern part of the area. The busy A149 (the 'coast road') forms the northern boundary between this area and the North Norfolk Coast NCA, with the A148 and the A47 running through east–west. Rail routes through North West Norfolk were lost following the Beeching report in the early 1960s.

There is major development pressure along the route of the A149 in particular as the north Norfolk coast is a 'honeypot' tourist area, and there is much development pressure around the fringes of King's Lynn.

There are several large caravan and camping sites around Dersingham and Hunstanton and other income comes from sport shooting which is locally very important.

The geological history of the NCA is writ large in Hunstanton Cliffs.

The landscape through time

The geological history of the North West Norfolk NCA derives from complex tectonic events and changing environments and sea level. During the Cretaceous, deposits of iron-rich sandstone and mudstone were laid down in a shallow marine environment. These now form a ridge along the western side of the NCA and regionally important deposits are conserved at various SSSI such as Blackborough End Pit and Heacham Brick Pit. As the climate changed, terrestrial conditions prevailed before the sea rose again and the orange-coloured, iron-rich carstone (a variety of sandstone) – now exposed at Hunstanton Cliffs SSSI – was laid down. A warm, shallow sea gave rise to the fossiliferous red chalk which may have gained its colour from salt diapirs bringing up earlier, Triassic, sediments. This was followed by the deposition of what is now white chalk. These strata, shown spectacularly in the cliffs at Hunstanton, all dip gently to the east.

The area is covered by superficial deposits of varying depths of gravels, sand and mixed soft, clayey sediments as well as till deposits resulting from glacial and fluvial activity. In the east of the area light glacial soils of a sandy or loamy texture – the 'Good Sands' – make this one of the most productive arable regions in the country. North West Norfolk NCA contains important terrestrial archives of Pleistocene glaciations, including Old Hunstanton Esker and the important pingos – shallow periglacial depressions – at East Walton and Adcock's Common SSSI, the glacial deposits at Bawsey SSSI and Tottenhill still being very much the focus of research. These archives constitute a nationally important record of climate and environmental change.

There is a long history of settlement within the NCA. There is evidence, in the form of Palaeolithic stone tools found within the deposits of this NCA, that early humans would have been present from about 500,000 years ago, if not earlier and there are remains of prehistoric barrows.

The light and comparatively fertile chalk soils have long supported settlement, with identified cultivation patterns dating back to the Bronze and Iron ages; there are remains of iron-age forts at Bloodhill and Warham Camp – an Iceni fort.

Roman settlement of the area, evidenced by the remains of Roman villas and known from aerial photography and excavation, was extensive. The Peddars Way, now a National Trail, was a Roman military route which ran north from near Thetford to Brancaster and Holme and there is a Roman fort at Brancaster.

Anglo-Saxon settlement is also well attested from archaeological evidence such as the major cemetery at Walsingham.

Settlement in the medieval period was scattered with isolated farmsteads and hamlets and widely spaced villages, the latter often irregular in plan and clustered around commons and greens.

The larger and more orderly settlements were planned around military and commercial cores, as at Castle Rising, or ecclesiastical centres such as the pilgrimage centre at Walsingham.

In 1061 Richeldis de Faverches, a local noblewoman, had a vision of the Virgin Mary during which she was instructed to build a replica of the house of the Holy Family. Walsingham ('England's Nazareth') subsequently became a major centre for pilgrimages, eventually rivalling Rome and Canterbury in importance. The abbey that had been established was destroyed during the Reformation in 1538; there has been a subsequent revival with Roman Catholic pilgrimages restarting at the Slipper Chapel in 1898 and a prominent Anglican shrine, forming the heart of a complex, being built in 1931. The Russian Orthodox church has converted the former Little Walsingham railway station into a church. Walsingham is now again a major pilgrimage centre, receiving approximately 350,000 pilgrims of all ages every year.

The history of shrines at Walsingham dates back to 1061.

As a result of the Black Death in the 14th century, there was widespread desertion and shrinkage of settlements. The village of Egmere has been deserted since the 16th century – all that remains is the ruin of the church tower. As the population recovered, the area was largely cleared of tree cover by the 17th century. Subsequent rebuilding removed much of the evidence of timber-frame construction and led to widespread use of flint from the chalk and locally produced brick, with carstone used more extensively nearer to its source in the Greensand ridge to the west.

A church in the landscape.

It is on the upland areas that the large estates for which this area became so well known were established. Houghton Hall, built by Robert Walpole, was the first, with Holkham, Raynham and Sandringham following. The area's historic field patterns date back to the time of the18th-century work of Viscount Charles 'Turnip' Townshend of Raynham Hall who had a major role in the agricultural revolution: he made the 'Good Sands' the most famous farming area in the country as he pioneered the four-field crop rotation and the large-scale cultivation of turnips. As these farming techniques evolved dramatically, so did the landscape. Other new techniques, including manuring by sheep folding on farmed land, produced further improvement – the typical wide verges which complement the field patterns probably mark former sheep drives.

In terms of structure, farmsteads in these areas typically dated from the late 18th to mid-19th centuries and were placed at the centre of their fields, equipped with often extravagantly large, brick barns; they were worked by men of capital. Their buildings are of brick and flint with clay-tiled roofs, although locally carstone and chalk are used, creating a rich texture and colour range in even the most ordinary walls.

The development of these enormous landholdings in the 18th and 19th centuries influenced the entire pattern of settlement, removing some villages and rebuilding others in a variety of controlled styles. The houses of the landowners themselves exhibit a range of styles including strict Palladian (Holkham, Houghton) and Neo-Jacobean (Sandringham) and introduce a variety of stone, brick and stucco rarely seen elsewhere in the area. Sandringham, still a country retreat for royalty, was bought by Queen Victoria in 1862 but was shortly afterwards demolished and a larger edifice built. Although the houses are largely concealed from view, the presence of the estates is made evident by extensive boundary walls in brick and flint, lodge buildings and parkland plantations.

Recent changes to the landscape have been far less radical than has been the case for other parts of the country, so the area has retained its strongly rural character. The main pressures for change come from housing development and tourism during the 20th century, which has resulted in large caravan and camping sites along the western boundary and heavy traffic at peak seasons along the A149 boundary with the North Norfolk Coast NCA.

Ecosystem services

The North West Norfolk 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 North West Norfolk NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision**: There is major commercial agriculture in this NCA, with 80 per cent of the farmed area used for cropping. In general, there has been a small decline in the amount of land used for cereals and general cropping over the last decade although oilseed production has increased. There are just over 13,000 ha of grassland (permanent or temporary) and uncropped land, representing some 19 per cent of the total farmed area. While suckler cow numbers have remained roughly static, lamb production has contracted by over 50 per cent. Pig farming has increased.

- **Timber provision**: Commercial timber production takes place on the Sandringham Estate and the other large estates (for example, at Holkham and Houghton). There is scope for planting further woodland, especially broadleaved and mixed plantations.

- **Water availability**: The main rivers in the NCA include the Stiffkey, Nar, Burn and Babingley. A number of chalk aquifers underlie the NCA and extend beyond it to the east and the south, and the Sandringham Sands aquifer underlies the western side. In the north of the NCA, part of the chalk aquifer directly overlies the Sandringham Sands but further south a Gault Clay layer separates the two, acting as a barrier and preventing the movement of water between the two. Increasing water abstraction for public water supply and crop irrigation may be affecting springs and seepages feeding the valley mires, while rivers are increasingly suffering from low flow conditions, particularly the Nar. Water from the chalk aquifer is also an important freshwater supply via springs to the coastal marshes of the North Norfolk Coast NCA.

- **Biomass energy**: The North West Norfolk NCA has a very large, open, rolling agricultural landscape that is likely to offer opportunities for biomass crops, adding variety to the large arable landscape and screening for some of the development along the coast, although the overall open character should be retained.

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

- **Climate regulation**: This NCA is relatively well-wooded compared with others in Norfolk and hence provides significant carbon storage resource, although the predominantly large fields and hence lower density of hedges offset this to some extent. In contrast, the light sandy and loamy soils under agricultural management offer poor carbon storage potential and are at risk of erosion.

- **Regulating water quality**: The whole of this NCA is a nitrate vulnerable zone and a catchment sensitive farming priority area with erosion-prone soils. The rivers are of moderate ecological quality and do not require assessment for their current chemical quality. The groundwaters are of high or intermediate vulnerability.

- **Regulating soil quality**: The name 'Good Sands', often applied to the eastern half of this area, derives from the fertility of the versatile light soils which distinguish the area from the low-fertility sands of Breckland to the south. To the west, where some remnant heathland is now found, sandier, less fertile soils cover the Chalk and Lower Greensand outcrops and were traditionally predominantly heathland, commons and warrens, dissected by the west-flowing pastoral river valleys.

- **Regulating soil erosion**: The dominance of free-draining soils means that all but 3 per cent of the soil types covering the NCA are at high risk of erosion. Many of the soils (covering 84 per cent of the NCA) are subject to wind erosion. Many of the soils found in the NCA are also at risk of erosion from surface water run-off where cultivated or bare soil is exposed, particularly on moderately or steeply sloping land.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration**: Sense of place is provided by the large-scale, open, rolling arable landscape accentuated by the large geometric field pattern of the 18th century.

  Carstone and chalk are distinctive vernacular building materials in the west of the NCA, with flint more common further east and inland.

  The NCA has inspiring sunsets – Hunstanton and the surrounding area are the only places in the east of England where you can watch the sun setting over the sea.

  Sandringham Estate and other historic estates and houses are major features influencing the character of the landscape, but are mainly only visible from within their walls.

Walsingham has for centuries been a place of spiritual inspiration, with pilgrimages restarting in the 20th century after destruction of the Marian shrine during the dissolution.

Ivy-leaved toadflax near Creake Abbey.

- **Sense of history**: Bronze- and iron-age cultivations have been found at Ken Hill and an Iceni iron-age fort at Warham, and there is much evidence of Roman occupation. The Peddars Way, now part of a National Trail, was a Roman military road.

  The picturesque town of Castle Rising dates back to the time of William the Conqueror, although as the coastline has evolved, it has ceased to be a port. Even in modern times it retains its 'bastide' (fortified) plan.

  There are several country houses with big estates. Robert Walpole, the first Prime Minister, started a trend for Palladian houses and great parks with the construction of Houghton Hall; the Royal estate at Sandringham is nationally famous, as is the village church. The area's historic field patterns date back to the 18th-century work of 'Turnip' Townshend of Raynham Hall when the 'Good Sands' became the most famous farming area in the country. Farming techniques were dramatically altered and, with them, so was the landscape.

- **Recreation**: A key resource is the scenic value of the area and visitor attractions such as coastal views, Sandringham and other country houses with their parklands, and the seaside town of Hunstanton.

  There are caravans, campsites and beach chalets at Heacham, Snettisham and Dersingham. The A149, which effectively follows the western and northern boundaries of the NCA, carries huge quantities of tourist traffic, particularly for the north Norfolk coast.

  The Peddars Way and Norfolk Coast National Trail starts in The Brecks NCA, traverses the NCA from Castle Acre to the North Norfolk Coast NCA and then continues along the coast to the Central North Norfolk NCA.

  Inland, North West Norfolk NCA is identified as having lower than regional average outdoor access opportunities, which is likely to imply that local people are reliant on travelling further (that is, by car) for regular recreation activities such as walking a dog. Local initiatives are helping to improve access to the Gaywood Valley.

- **Biodiversity**: The NCA is bordered to its north and west by two SPAs (The Wash and the North Norfolk Coast), which are also designated as Ramsar sites and SAC; Roydon Common and Dersingham Bog, which share the latter two designations, lie within its boundaries.

  Just under 3 per cent of North West Norfolk NCA consists of priority habitats, including lowland heathland, coastal and flood plain grazing marsh, reedbeds, purple moor grass and rush pastures, and smaller areas of wet woodland, lowland beech and yew woodland, lowland calcareous grassland, lowland meadows and fen – but these all tend to be fragmented within such an extensively cultivated landscape.

  There are important assemblages of farmland birds, including turtle dove and grey partridge.

- **Geodiversity**: North West Norfolk NCA has important mineral resources; for silica sand (a highly specialised mineral present in only a handful of localities in England and quarried from sites in the Leziate–Bawsey–Middleton–East Winch area), it is one of the largest producers of in the country, while carstone is quarried at East Winch and Middleton. Sand and gravel are taken primarily from the area to the east and south-east of King's Lynn. Hunstanton Cliffs are famous for their red chalk; the cliffs record a changing climate and environmental conditions during the Cretaceous, when the Earth was experiencing greenhouse conditions. North West Norfolk NCA's succession of Pleistocene sediments is of major importance and the pingo systems at East Walton and Adcock's Common SSSI are nationally important for both their geological and biological interests.

Statements of Environmental Opportunity

SEO 1: Protect and manage the nationally important agricultural landscape and plan for it to become more resilient to the likely impacts of climate change while seeking to enhance landscape, habitat integrity and connectivity for the benefit of wildlife and managed access for people.

For example, by:

- Protecting and encouraging sustainable agriculture in this nationally important agricultural area though crop rotation and the use of environmental land management schemes.
- Planning for climate change by promoting diversification of cropping, especially towards agricultural regimes which help to conserve water.
- Introducing fallow years into rotations, leaving overwintering stubble to mitigate soil erosion and benefit farmland birds using minimal cultivation and arable reversion to protect archaeological and historical ground features.
- Ensuring that water storage reservoirs are constructed to cope with possible increased future droughts resulting from changing climate, as well as to provide freshwater habitats.
- Conserving and supporting the populations of bird species associated with arable farming through the creation of buffer strips and uncut grass field margins, as well as maintaining adjacent grassland areas where appropriate.
- Promoting the reversion of flood plain arable land back to grassland, creating wet pasture and grazing marsh where possible.

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The North West Norfolk NCA is very important for agriculture.

SEO 1: Protect and manage the nationally important agricultural landscape and plan for it to become more resilient to the likely impacts of climate change while seeking to enhance landscape, habitat integrity and connectivity for the benefit of wildlife and managed access for people.

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- Creating more margins, buffer strips and grassland within the farmed land to contribute to water quality and availability and the reduction of soil erosion; these features will also benefit pollination.
- Ensuring that hedgerows and hedgerow trees are well managed, and restoring hedges where this will strengthen the historic hedgerow pattern and reduce soil erosion.
- Maintaining the small-scale pastoral character of river valleys and extending areas of permanent grassland where possible, to improve infiltration of rainwater.
- Maintaining traditional river valley pastures and damp scrub (rivers Stiffkey, Burn, Babingley and Nar) and pastures in the farmland with woodland and wetland sub-area, through appropriate grazing management.
- Restoring watercourses to natural profiles and flooding regimes; allowing them to follow more natural courses; and supporting the operation of natural processes – with consequent benefits in terms of floodwater storage and retention.
- Maintaining water quality and using relevant scheme options to buffer watercourses against water quality deterioration caused by high nutrient levels and lowered flows.

SEO 2: Conserve, enhance and increase public awareness of the distinctive historic and rural landscape and local towns and villages, and improve public awareness, enjoyment and access to the NCA's heritage and distinctive geology.

For example, by:

- Creating and enhancing opportunities for public access by establishing additional access points/linkages between existing public footpaths, settlements, communities, amenities, transport links, the coastal access route and the Peddars Way and Norfolk Coast Path National Trail, and creating links to the more heavily used coastal areas.
- Improving access to the coast for walking, cycling and disabled people through the sustainable use of old railway lines, tracks and paths and encouraging reduced car use. Securing opportunities for the public to enjoy the natural environment through the implementation of the England Coast Path while ensuring appropriate protection of it.
- Ensuring promotion of access opportunities informs people about the vulnerability of the coastal habitats in the NCA and encourages visits of a low-impact nature which avoid any adverse impacts on agricultural management, landscape, habitats and wildlife.
- Promoting the wealth of inspiring and historic buildings and places within the NCA, providing interpretation where appropriate.
- Conserving and enhancing historic landscape features and wildlife habitats within the planned open spaces associated with new development.
- Creating new quality areas, especially in woodlands, for people to walk their dogs off-lead, close to local communities and away from traffic, while respecting nature conservation designations and other land management needs.
- Maintaining views across the rolling landscape; developments within villages should conserve and enhance their nucleated character and street patterns and retain important views (for example, to local landmarks such as church towers).
- Interpreting the underlying geology, especially at Hunstanton Cliffs and where Pleistocene sediments and features are accessible, and highlighting their importance as records of climate and environmental change.
- Managing and restoring historic features and designs of parks and gardens, providing access where possible, and interpreting local history.
- Reducing risk and promoting the positive management of designated and (non-designated) heritage assets through the use of environmental land management schemes and beneficial agricultural practices.
- Managing road verges for their species richness, to support pollinators and to strengthen landscape character, providing enjoyment for residents and visitors.
- Promoting local design guidance, and for new development promoting the adoption of vernacular building materials, for example, carstone and flint.
- Using traditional local building materials and retaining a unity of construction materials within villages.
- Promoting the improvement and upgrading of existing holiday developments in keeping with the local vernacular.

SEO 3: Protect and appropriately manage the woodland resource, combining commercial forestry and fuel production, expanding and improving connectivity between broadleaved woodlands for the benefit of wildlife, strengthening landscape character, and improving recreational opportunities.

For example, by:

- Enhancing conifer plantations (particularly in the south and west of the NCA) through the introduction of native broadleaved species upon clearfelling.
- Exploring the possibilities of removing conifers and restoring land to heathland where appropriate while finding compensatory places for planting so that the overall woodland area is not reduced.
- Conserving semi-natural woodland areas where they form skyline features, particularly adjacent to main river valleys such as the Nar and Stiffkey.
- Working to remove rhododendron and prevent its re-establishment.
- Creating new woodlands using native species and retaining and managing the striking Scots pine shelterbelts that define a number of the field margins.
- Promoting the selective removal of some less appropriate shelterbelt species and replacement with species that are traditional and consistent with the character of the lanes.
- Enhancing wildlife corridors through increasing the connectivity of small woodland blocks with margins, grassland strips and hedgerows.
- Planting biomass crops and encouraging local farm businesses to increase appropriate-scale generation of heat, utilising woody biomass for woodchip boilers where it is sustainable to do so.
- Managing the woodlands to sustain the populations of nightjar that hunt above and in proximity to them.
- Restoring areas of plantations on ancient woodland sites to increase biodiversity and benefit priority species.
- Improving and promoting access to the NCA's woodlands to raise awareness of their importance and increase enjoyment of them. Improving interpretation of the history, archaeology, geology, landscape and wildlife of the area through signage and interpretation boards, leaflets and online resources.

SEO 4: Protect and manage the unique geological and biological resource of the NCA and plan for the restoration of semi-natural habitats and improved connectivity where opportunity arises to help make the landscape and its important species more resilient to future pressures for change.

For example, by:

- Maintaining and enhancing the geological resource through the development of local geological conservation strategies, assessment of the educational/research value of new sites and by realising any opportunity that might be created by mineral extraction.
- Promoting the geological resource through the assessment and promotion of sites of scientific and educational value, and developing on-site interpretation, including promotion of the influence of geodiversity on local habitats and landscape.
- Identifying opportunities for geodiversity and biodiversity enhancement which might develop from re-naturalisation of watercourses, such as establishing wetland habitats – including wet pasture and wet woodland – and identifying the benefits of natural processes.
- Extending heathland and grassland habitats associated with the mineral workings close to King's Lynn.
- Protecting, managing and expanding priority habitats, including flood plain grazing marsh near Narborough and Coxford, and heathlands and grasslands, for example at Dersingham Bog and Syderstone Common. There is also scope for restoring the remains of the peat deposits in the valley systems and restoring fen, wet woodlands, purple moor grass and rush pasture.
- Restoring sand and gravel extraction sites for the benefit of biodiversity, geodiversity and priority habitats.
- Continuing to extend and connect heathland and mire habitats through clearfelling of conifer plantations.

Dersingham Bog National Nature Reserve is a key biodiversity site within the NCA.

Supporting document 1: Key facts and data

Area of North West Norfolk National Character Area (NCA): 80,140 ha

1. Landscape and nature conservation designations

North West Norfolk NCA contains the Norfolk Coast Area of Outstanding Natural Beauty (AONB) which covers 20 per cent of the NCA area. It also contains the North Norfolk Heritage Coast which covers <1 per cent of the NCA.

Management plans for the protected landscape can be found at:

- www.norfolkcoastaonb.org.uk/

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	% of NCA
International	Ramsar	Roydon Common; Dersingham Bog; North Norfolk Coast; The Wash	342	<1
European	Special Protection Area (SPA)	North Norfolk Coast SPA; Roydon SPA; The Wash SPA	19	<1
	Special Area of Conservation (SAC)	Roydon Common and Dersingham Bog SAC; Norfolk Valley Fens SAC; River Wensum SAC; North Norfolk Coast SAC; The Wash and North Norfolk Coast SAC	454	<1
National	National Nature Reserve (NNR)	Roydon Common NNR; Dersingham Bog NNR; Holkham NNR	341	<1
	Site of Special Scientific Interest (SSSI)	A total of 17 sites wholly or partly within the NCA	748	<1

Source: Natural England (2011)

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

There are 464 ha of land covered by international nature conservation designations (<1 per cent of the total land area). In total, 748 ha of the NCA are nationally designated. All 3 NNRs are also designated as SSSI. There are 149 local sites in North West Norfolk covering 2,305 ha, which is 3 per cent of the NCA.

Source: Natural England (2011)

- Details of individual Sites of Special Scientific Interest can be searched at: http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm
- Details of Local Nature Reserves (LNR) can be searched at: http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp
- 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	66	9
Favourable	132	18
Unfavourable no change	31	4
Unfavourable recovering	518	69

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 majority of the NCA is low lying (averaging at 38 m above sea level). The lowest point within North West Norfolk NCA is 0.2 m below sea level rising to a maximum height of 94 m above sea level.

Source: Natural England 2010; North West Norfolk Countryside Character Area description

2.2 Landform and process

In the west the sequence of the uppermost Jurassic and Cretaceous rocks dips gently eastwards with the oldest rocks outcropping along the eastern edge of the Fens and Wash where the Lower Greensand forms a low escarpment. It is higher at its northern end than southern and is broken by a number of westward flowing rivers (rivers Nar and Babingley). These Lower Cretaceous sediments are in turn overlain by Upper Cretaceous chalk which again dips gently eastwards creating a shallow dip slope sloping west to east. Hunstanton in the north-west is the only place in East Anglia where tough, overhanging sea cliffs occur. Detached and fallen blocks of white chalk at the base of the cliffs at Hunstanton illustrate that these characteristic three-coloured cliffs are collapsing and moving inland all the time. The Good Sands (open chalk landscape) to the eastern half of the area is a large area of dry fertile rolling upland with chalk near the surface, especially on the valley sides.

Source: North West Norfolk Countryside Character Area description, North Norfolk Natural Area Profile

2.3 Bedrock geology

The area has one of the most complete sequences of late Jurassic to late Cretaceous marine strata in Britain. These are capped by an extremely important series of Pleistocene pre-glacial, inter-glacial and glacial deposits. The majority of the bedrock is chalk (74 per cent) with sand, mudstone and sandstone making up the vast majority of the remaining bedrock. The distinctively coloured cliffs at Hunstanton clearly demonstrate the transition from Early Cretaceous brown sandstone (carstone) to the overlying red Chalk and white Chalk of Late Cretaceous age. To the south of the NCA the red Chalk changes laterally to a contemporaneous deposit, the Gault Clay.

Source: North West Norfolk Countryside Character Area description, North Norfolk Natural Area Profile

2.4 Superficial deposits

The area is covered by superficial deposits of gravels, sand and mixed soft clayey sediments resulting from glaciations and post-glacial periods. These occur in varying depths. In the east of the area the Good Sands are covered by light glacial soils of a sandy or loamy texture.

Source: North West Norfolk Countryside Character Area description, North Norfolk Natural Area Profile

2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	6
National	Mixed Interest SSSI	5
Local	Local Geological Sites	0

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

The plateau is covered by brown rendzina soils. The soils of the Chalk scarp are variable, with outcrops of brown sands and sandy gley soils contrasting with the alluvial soils of the river valley. By the mid-18th century the fertile soils of the Good Sands in the east helped make this one the most productive arable regions in the country.

Source: North West Norfolk Countryside Character Area description, North Norfolk 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	0	0
Grade 2	8,009	10
Grade 3	57,536	72
Grade 4	8,296	10
Grade 5	0	0
Non-agricultural	5,966	7
Urban	331	<1

Source: Natural England (2010)

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

3. Key water bodies and catchments

3.1 Major rivers/canals

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

- River Babingley 11 km
- River Nar 11 km
- River Stiffkey 10 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.

The general geology of gravels and other drift deposits overlying Chalk results in the rivers deriving their water from both calcareous and more acid sources; however, generally the water is calcium-rich. The rivers have mostly slow to moderate flows because of the low lying topography. All of the rivers have been modified by man, usually by widening and deepening and drain largely rural catchments so are heavily influenced by farming practices.

The River Nar originates as a spring-fed stream and is moderately flowing over a gravel bed for much of its upper and middle length. It has a wide range of natural physical features including riffles and pools, together with many active springs either in or adjacent to the river along its upper and middle course. There are a few water-control structures mostly associated with mills.

The River Babingley starts its main course west of Hillington, as a gravel bed stream with riffle pool sequences, flowing through and adjacent to woodland. The middle reach is tightly meandering through predominately arable land and then becomes a straight-sided drain in its lower reaches, where a riffle pool sequence dominates this chalk stream.

The River Burn behaves as an intermittent bourne and is unusual in that its source is drift, but stretches are over Chalk which may be above the water-table in which case the river disappears underground for part of its length during periods of severe drought.

Source: North Norfolk Natural Area Profile

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 80,139 ha, 100 per cent of the NCA.

Source: Natural England (2010)

3.3 Water Framework Directive

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

http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

4. Trees and woodlands

4.1 Total woodland cover

The NCA contains 8,124 ha of woodlands over 2 ha, covering 10 per cent the NCA of which 47 ha is ancient woodland.

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

4.2 Distribution and size of woodland and trees in the landscape

The woodland is concentrated on the Greensand to the west of the NCA. Farmland is divided by large woodland blocks and shelterbelts of mixed woodland which are not, however, of sufficient scale to lend a wooded character to the landscape, except for the extensive plantations around the big estates such as Holkham, Sandringham, Houghton and Raynham which contain plantations of broadleaved and conifers. Ancient semi-natural woodland is scarce and the absence of hedgerow trees and copses is noticeable, especially in the northern half of the area.

Source: North West Norfolk Countryside Character Area description, North Norfolk 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	5,059	6
Coniferous	2,696	3
Mixed	108	<1
Other	261	<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	47	<1
Planted Ancient Woodland (PAWS)	173	<1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Boundary features are mainly tall, well-trimmed hawthorn hedgerows with an absence of hedgerow trees. Where hedgerow trees exist these are predominantly oak and beech. Hedgerows are often flanked by wide verges.

Source: North West Norfolk Countryside Character Area description; Countryside Quality Counts (2003)

5.2 Field patterns

The field pattern is dominated by large-scale geometric 18th century enclosures consisting of large rectangular fields containing extensive arable cropping and some areas of mixed farming. There are occasional bleak areas where hedgerows have been removed to make larger fields. The few strips of pasture that do exist have little impact on the general uniformity of the landscape although they do add considerably to the variety of the landscape around the river-valley villages.

Source: North West Norfolk 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

In 2009 there were 326 commercial holdings registered in the NCA. More than two-thirds of farms were arable, with 39 per cent under general cropping and 25 per cent cereals. Grazing livestock farming accounted for 10 per cent of farms. Since 2000 there has been a 33 per cent reduction of general cropping farms and a 36 per cent increase in cereal farms.

Source: Agricultural Census, Defra (2010)

6.2 Farm size

The vast majority of the commercially farmed area (93 per cent) within North West Norfolk NCA is found within holdings over 100 ha. These account for approximately half of the farms in this area. There has been no significant increase in farm size through agglomeration recorded over the last decade.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

2009: Total farm area = 71,274 ha; owned land = 43,421 ha
2000: Total farm area = 68,182 ha; owned land = 39,525 ha

In 2009 the majority (43,421 ha) of the farmed area within this NCA was registered as 'Owned land', with 29,663 ha registered as 'Tenanted'. Patterns of owned and tenanted land have shown little change over the last decade.

Source: Agricultural Census, Defra (2010)

6.4 Land use

In 2009 the land was predominantly used to produce cereals (45 per cent), cash roots (15 per cent), oil seed rape (7 per cent) other arable crops (3 per cent) and vegetables (2 per cent). The area of land farmed for oilseeds almost trebled in the

period 2000 to 2009, covering 5,126 ha (7 per cent of the total). Cash roots declined by 1,626 ha (13 per cent). There was a slight increase in uncropped area over this period from 16 per cent to 19 per cent of total farmed area.

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

The majority of livestock are pigs (60,500) accounting for 79 per cent of livestock, a number which more than doubled between 2000 and 2009. Cattle (7,300) and sheep (9,000) numbers account for a much smaller proportion of livestock. Livestock numbers are generally low due to the predominance of arable within the area. Sheep numbers more than halved between 2000 and 2009 despite there being a recorded increase in grass and uncropped area.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

The majority of farms are run by principal farmers 423 (44 per cent of the agricultural labour force in 2009), with a smaller number run by salaried managers (67). Farm labour reduced by a third (a net loss of 600, 38 per cent) between 2000 and 2009 with trends shared for both full time and casual labour.

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

Open commons with poor soil are notable features of this area. A number of internationally important heathlands with acidic mire systems are present on the Lower Greensand, notably at Dersingham NNR and Roydon Common NNR, Ken Hill and at Ling Common east of North Wootton, although large areas of Ling Common have succeeded to secondary woodland. Other smaller areas of heathland habitat and relict heath are concentrated in the Sandringham area. There is an isolated but important heath at Syderstone Common west of Fakenham which contains non-permanent pools which support one of the UK's last inland heath colonies of the internationally important natterjack toad *Epidalea calamita*. The heathlands also support a nationally important population of nightjar *Caprimulgus europaeus* particularly at Dersingham Bog SSSI. The pingo systems at East Walton Common and Adcock's Common are considered to be of outstanding importance in a national context, both for their geological and biological interest. These sites also support areas of chalk grassland. Despite the fact that chalk underlies much of the area chalk grassland is very restricted in distribution. The main concentration of chalk grassland is in the Good Sands area to the north at Ringstead, Wells, Cockthorpe and Warham. In addition the NCA contains important arable habitats. These support nationally important assemblages of arable birds.

Source: North Norfolk Natural Area Profile

7.2 Priority habitats

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

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

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

Priority habitat	Area (ha)	% of NCA
Broadleaved mixed and yew woodland (broad habitat)	1,983	2
Reedbeds	1,835	2
Fens	1,411	2
Coastal and flood plain grazing marsh	272	<1
Purple moor grass and rush pasture	231	<1
Lowland calcareous grassland	112	<1
Lowland meadows	80	<1
Lowland dry acid grassland	49	<1
Lowland heathland	31	<1
Maritime cliff and slope	4	<1
Coastal sand dune	1	<1

Source: Natural England (2011)

The figures for both reedbeds and fens are likely to be overestimates. Heathland figures are an underestimate.

Maps showing locations of priority habitats are available at

- **http://magic.Defra.gov.uk/website/magic/ select** 'Habitat Inventories'

7.3 Key species and assemblages of species

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

8. Settlement and development patterns

8.1 Settlement pattern

Villages are widely spaced (6 to 8 km apart) generally small and often set around what may be one or a series of village greens or ponds, forming nucleated clusters which retain a great variety of open internal spaces. There is relatively little infill and the dominant building style is 18th and 19th century. The great houses of the many large estates are generally concealed by tree belts which fringe their large parks.

Source: North West Norfolk Countryside Character Area description; Countryside Quality Counts (2003)

8.2 Main settlements

There are no major settlements within this largely rural NCA. Parts of King's Lynn straddle the NCA boundary to the south-west and the coastal resort town of Hunstanton sits on the coast in the north-west. The total estimated population for this NCA (derived from ONS 2001 census data) is: 50,150.

Source: North West Norfolk Countryside Character Area description; Countryside Quality Counts (2003), Natural England (2012)

8.3 Local vernacular and building materials

Flint is the near universal building material for houses with pantile or slate roofs. It is also frequently used for extensive walls within villages. Orange-brown 'carstone' and chalk are used as building material along the western edge of the area. 'Carstone' is a particular feature of the coastal strip as at Wolferton and Hunstanton. The use of carstone creeps inland as far as East Raynham where it

is used with 'clunch', the local 'building' chalk. Pegtiles rather than pantiles are a feature towards the Downham Market – King's Lynn area. The great houses of the big estates (Holkham, Sandringham, Houghton and Raynham) have extensive brick and flint walls. The house of Holkham and Houghton are Palladian in style while the 19th century houses such as Sandringham call on a range of borrowed styles.

Source: North West Norfolk Countryside Character Area description; Countryside Quality Counts (2003)

Trinity Hospital: Deep history and vernacular building materials in Castle Rising.

9. Key historic sites and features

9.1 Origin of historic features

The light and comparatively fertile chalk soils have long supported settlement, with identified cultivation patterns found at Ken Hill and Warham dating back to the Bronze and Iron Ages. Roman settlement was extensive, no doubt influenced by the military route (The Peddars Way) which ran north through the area from to Brancaster and Holme. Anglo-Saxon settlement is well attested from archaeological evidence, such as the major cemetery at Walsingham. The area was transformed from sheepwalk heathland commons and intricate strip holding to a large-scale rectilinear landscape during the late 17th and 18th centuries, which influenced the pattern of settlement. Enclosure for pasture was largely complete on the poorer and more acidic upland soils by 18th century, with individual farmsteads occupying sites of settlements deserted after 14th century. The large 18th century estates for which this area became so well known – Holkham, Raynham, Houghton, Sandringham – were centred on these upland areas.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 7 Registered Parks and Gardens covering 2,517 ha
- No Registered Battlefields
- 132 Scheduled Monuments
- 1,123 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

- One per cent of the NCA, 726 ha, is classified as being publically accessible.
- There are 363 km of public rights of way at a density of 0.5 km per km^2.
- There is 1 National Trail, the 'Peddars Way and Norfolk Coast' that covers 40 km.

Sources: Natural England (2010)

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

Access designation	Area (ha)	% of NCA
National Trust (Accessible all year)	6	<1
Common Land	451	<1
Country Parks	204	<1
CROW Access Land (Section 4 and 16)	726	<1
CROW Section 15	107	<1
Village Greens	25	<1
Doorstep Greens	<1	<1
Forestry Commission Walkers Welcome Grants	1,258	1
Local Nature Reserves (LNRs)	7	<1
Millennium Greens	0	0
Accessible National Nature Reserves (NNRs)	359	<1
Agri-environment Scheme Access	54	<1
Woods for People	1,371	1

Sources: Natural England (2011)

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

11. Experiential qualities

11.1 Tranquillity

Based on the CPRE map of tranquillity (2006) it appears that the lowest scores for tranquillity are associated with coastal town of Hunstanton together with the edges of King's Lynn in the south-west and Fakenham in the east. Disturbance can also be seen associated with the main transport routes linking these centres; the A47, A148 and A149. The highest scores for tranquillity are within the inland agricultural land away from the main transport routes such as Massingham Heath in the south or to the east of Docking in the north.

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

Category of tranquillity	Score
Highest value within NCA	43
Lowest value within NCA	-58
Mean value within NCA	9

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 disturbance is associated with the 'A' roads that run through the area including the A47, A148 and A149. Intrusion also occurs around the outskirts of King's Lynn and the coast town of Hunstanton.

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

Category of intrusion	1960s (%)	1990s (%)	2007 (%)	% change (1960s-2007)
Disturbed	11	17	24	13
Undisturbed	89	82	75	-14
Urban	<1	<1	<1	0

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are an increase in notably disturbed or intruded land by nearly 13 per cent which is matched by a reduction of around 14 per cent of undisturbed or un-intruded land over the same timescale. This is most probably due to the significant impact of the increased transport network in the south of the NCA, and the expansion of the settlements of King's Lynn, Dersingham and Hunstanton in the north.

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

Rectangular fields with well-trimmed hedges are typical of this area.

12. Data sources

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

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

Supporting document 2: Landscape change

Recent changes

Trees and woodlands

- Large blocks of woodland are a major feature of the greensand ridge at the western side of the NCA, and there has been little recent change in these features.
- Some areas of conifers have been removed through initiatives to restore heathland and acid mire, as at Dersingham and Grimston Warren. Overall, the area of broadleaved woodland has increased in recent years.
- There has been a significant overall increase in rhododendron over the past 15 years, but this has been offset to some extent by site-specific control.

Boundary features

- This is a relatively stable, open, rural landscape which has not experienced significant change recently.
- Within the NCA, more than 1,000 km of hedgerows, consisting mainly of well-trimmed hawthorn are under environmental stewardship options.

Agriculture

- Agriculture remains the key contributor to the local economy. There has been little recent change in field sizes and there is little evidence of loss of hedgerows.
- Between 2000 and 2009 there was an increase in the production of cereals and particularly oilseeds that saw a threefold increase.
- The number of pigs farmed increased dramatically during the early 2000s while the number of sheep more than halved. As a result there is more evidence of pig rearing with fields that tend to be of bare earth and corrugated metal sties.

Settlement and development

- Recent changes to the landscape as a result of development have been far less in this NCA than has been the case for other parts of the country, so that the area has retained much of its rural character.
- Although some recent developments have used local vernacular materials, there is evidence in many villages of the use of uncharacteristic building materials which detract from the overall unity and character.

Semi-natural habitat

- Of the priority habitats, internationally important lowland heathland with acidic mires is showcased at Dersingham Bog National Nature Reserve (NNR), where major recent clearance of silver birch has been carried out, and at Roydon Common NNR where initiatives to clear conifers to improve conditions for species including nightjars is occurring.

Historic features

- The current shrine complex at Walsingham, which dates back to the early 20th century, has continued to grow with the purchase of Walsingham's former railway station to become St Seraphim's (Russian Orthodox) Chapel in 2008.

- Countryside Quality Counts notes that about 89 per cent of historic farm buildings remain unconverted, and most are intact structurally.

Coasts and rivers

- North West Norfolk has only a short stretch of coast, at Hunstanton. The associated views have been preserved largely due to the multiple nature conservation designations of The Wash and the North Norfolk Coast.

- The watercourses in the south and south-west of the NCA have been modified to prevent flooding to such an extent that they have become separated from their flood plains.

Minerals

- Local carstone and chalk are being quarried and used in construction including walls, bridges, churches and houses.

- High-quality sands, used for making glass, are extracted around the Leziate–Bawsey–Middleton–East Winch area.

- Carstone is being quarried at Middleton and Snettisham, sand and gravel at locations including Crimplesham, Tottenhill, Feltwell and Hillington.

- Quarries/pits have been restored to benefit wildlife – Wicken North, near King's Lynn, is now a County Wildlife Site and restoration is in progress at Wicken South.

Drivers of change

Climate change

- Climate change may bring more extreme weather such as drier summers and wetter winters, more frequent and more intense storms or an increase in droughts which will affect both wetlands and watercourses.

- The agricultural landscape may change as farmers adapt to changes in weather or water availability by producing new crops. A longer growing season may lead to winter cropping and a loss in winter stubble with a consequent loss of food sources for farmland birds.

- The semi-natural grassland and heathland of the NCA would be susceptible to increasing periods of drought with possible change in species composition as a consequence. In addition warmer winters might make acid grassland and heathland prone to invasion by bracken.

- The area's woodlands, particularly those on drier soils, may be at increasing risk of fire. Species change may occur as trees from southern Europe that are more tolerant of drought conditions, such as the Holm oak, out-compete native trees.

- In addition, climate change may make trees more vulnerable to disease such as ash dieback. Warmer winters may allow pathogens and their vectors to increase their range.

- There may be an impact on watercourses which could potentially heat up and dry out.

Sea and sky merge at The Wash at Hunstanton.

Other key drivers

- Tourism to the north Norfolk coast is increasing, and this brings major pressure in terms of traffic and noise pollution, particularly in the areas adjacent to the A149 along the northern coast and near other main roads and pressure for more infrastructure including caravan sites and other facilities.
- Future mineral extraction may impact on the area's semi-natural habitats, although there may also be opportunities to restore old sites involving new habitat creation and recreation and access opportunities including educational interpretation.
- Greater demands on agriculture to increase productivity could impact on the remaining areas of semi-natural grassland and other semi-natural habitats. It may also lead to deterioration in water quality, through the run-off of soil nutrients and increased use of herbicides and pesticides.
- There are further pressures in terms of the conversion of traditional farm buildings and the expansion of small villages, especially along the northern boundary of the NCA.
- Recreation pressures and the increase in infrastructure are also leading to an increase in light pollution.
- There is an increasing demand for water for agriculture and for potable water for residents and tourists.

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.

Rhododendron at Dersingham – pretty but invasive.

Statement of Environmental Opportunity	Ecosystem Service																			
	Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity
SEO 1: Protect and manage the nationally important agricultural landscape and plan for it to become more resilient to the likely impacts of climate change while seeking to enhance landscape, habitat integrity and connectivity for the benefit of wildlife and managed access for people.	↑ ***	↔ **	↑ ***	↗ **	↗ ***	↑ ***	↑ ***	↑ **	↑ ***	↑ ***	↗ ***	↑ ***	↔ **	↗ ***	↑ ***	↔ **	↔ **	↗ **	↗ **
SEO 2: Conserve, enhance and increase public awareness of the distinctive historic and rural landscape and local towns and villages, and improve public awareness, enjoyment and access to the NCA's heritage and distinctive geology.	↗ **	↑ ***	↔ **	↔ **	↗ **	↗ **	↗ **	↗ **	↑ ***	↑ ***	↔ **	↔ **	↔ **	↑ ***	↑ ***	↑ ***	↑ ***	↗ **	↗ **

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	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
	Ecosystem Service																		
SEO 3: Protect and appropriately manage the woodland resource, combining commercial forestry and fuel production, expanding and improving connectivity between broadleaved woodlands for the benefit of wildlife, strengthening landscape character, and improving recreational opportunities.	↔ **	↑ ***	↗ **	↗ **	↑ ***	↑ ***	↑ ***	↑ ***	↗ **	↗ **	↗ **	↗ **	↔ **	↑ ***	↗ **	↑ ***	↑ ***	↑ ***	↔ **
SEO 4: Protect and manage the unique geological and biological resource of the NCA and plan for the restoration of semi-natural habitats and improved connectivity where opportunity arises to help make the landscape and its important species more resilient to future pressures for change.	↔ **	↗ **	↗ **	↑ ***	↑ ***	↑ ***	↑ ***	↑ ***	↗ **	↗ **	↑ ***	↑ ***	↗ **	↑ ***	↑ ***	↗ **	↗ **	↑ ***	↑ ***

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 attributes

Landscape attribute	Justification for selection
Large, rolling, open Western Greensand Ridge and plateau dipping gently to east.	■ The ridge and sloping plateau, which give North West Norfolk its distinctive landform, result from the underlying geology. By East Anglian standards, this is an upland area. ■ The strata, visible at Hunstanton Cliffs, provide a record of climate and environmental change during the Cretaceous when the Earth was undergoing greenhouse conditions. ■ There are views from the western ridge at for example, Dersingham across The Wash. ■ The more open, gently-rolling landscape of the east of the NCA provides a contrast to the wooded ridge but is still characteristic of this area.
Predominantly arable, with some grass, and limited/fragmented semi-natural habitats.	■ There is a strong geometric pattern of large regular fields bounded by hawthorn hedges. ■ Heathland along the ridge and on sandier soils, and ley (arable land temporarily put down to grass), are important terrestrial habitats. ■ Riverine habitats including grazing marshes within the small valleys are key features.
Clear and evident connections between underlying geology and subsequent historic development and land uses.	■ The local geodiversity is revealed both through natural features and through building stone. ■ Building using local stone has given a strong sense of visual continuity and local distinctiveness. ■ The history of land use, related to the underlying geology and arising soils, is clearly shown by the agriculture, especially on the 'Good Sands'.
Rich time depth with features from the Bronze Age onwards.	■ This is a small NCA with a great deal of history ranging from Palaeolithic to Bronze- and Iron Age to modern times (Sandringham and the re-established shrines at Walsingham) via the Romans (Peddars Way) and the 18th/19th centuries (country houses and estates).

Landscape attribute	Justification for selection
Rivers in small-scale valleys.	■ The rivers provide a counterpoint to the open agricultural landscapes and valuable habitats.
Large country house and estate parkland landscapes.	■ The 18th to 19th century estates with their designed parklands are important historic features. ■ These estates are particularly distinctive in character. Unlike in many parts of the country these estates are not remodelled from medieval and Tudor estates, but were new, Palladian halls. ■ The wood-pasture and parkland created in the landscape to enhance the visual appearance, now provides rare and valuable habitat including occasional veteran trees.
Blocks of and larger areas of woodland especially along the western ridge of the NCA and in the historic parklands.	■ Evergreen woodlands associated with historic parklands characterise the landscape, especially along the western edge of the NCA. ■ Deciduous woodlands associated with historic parklands are major landscape features and there is significant ongoing woodland planting at, for example the Sandringham Estate.
Villages and village greens and duck ponds.	■ Traditional greens and duck ponds are at the hearts of the villages. ■ Local villages are built from traditional building materials and in a distinctive style giving the NCA a visual unity.
Fields with wide margins and roads with very wide verges; few settlements.	■ These margins are a distinctive landscape feature. ■ The road verges give routes between high-hedged fields a sense of real openness.

Landscape opportunities

- Realise opportunities to protect the open landscape and extensive views, especially those to land and sea from the western ridge, particularly the landscapes that contribute to the Area of Outstanding Natural Beauty.
- Maintain the large-scale arable and grassland landscape with extensive arable cropping and some areas of mixed farming.
- Protect, buffer and expand the remnant heathlands on the Greensand in the west and elsewhere.
- Protect and enhance nationally important geological and mixed-interest sites (SSSI) and potentially important geological sites and unique features, including Quaternary sediments and soils (especially the Good Sands) and features including the pingo systems at East Walton and Adcock's Common SSSI.
- Enhance access to geodiversity features, and increase interpretation and appreciation of geodiversity including interpreting the links between these features and archaeological evidence of human activity and through the use of locally sourced building materials.
- Carefully manage and interpret the extensive archaeological evidence and historic sites within the landscape both above and below ground.
- Protect and restore parkland landscapes and designs and historic features and improve access where possible; protect their veteran trees and manage wood pasture.
- Find ways to let rivers follow more natural courses, thus allowing more active geomorphological processes as well as opportunities for creating priority habitats including wet woodland and wet pasture.
- Protect and manage the large significant belts of mixed woodland and increase the proportion of broadleaves and the distinctive belts of pines in the west.
- Encourage the use of arable margins and strengthen, restore and manage boundary hedgerow patterns.
- Maintain the network of road verges for the benefit of local communities, visitors and biodiversity and to retain the sense of openness.
- Support development that seeks to protect the intrinsic character and settlement pattern of villages and small towns, using local building materials where possible.
- Improve the access and recreation resource within the area to provide opportunities to observe fauna and flora and to aid appreciation of the landscape and its history, encouraging people to explore inland to decrease pressure on the coastal strip.
- Work to minimise the effects of light and noise pollution, especially from the A149, A148 and A47, in rural areas.
- Strengthen the rights of way network which is limited in parts of the inland areas of the NCA.

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
Food provision	Fertile and versatile soils	The plateau is covered by brown rendzina soils, but the soils of the chalk scarp are variable, with outcrops of brown sands and sandy gley soils contrasting with the alluvial soils of the river valley. The fertile soils of the 'Good Sands' in the east help make this one of the most productive arable regions in the country. In 2009, 45 per cent of arable land was used to produce cereals, 15 per cent for cash roots; 7 per cent for oil seed rape, 5 per cent for other arable crops and vegetables. The area of land farmed for oilseeds almost trebled from 2000 to 2009 covering 5,126 ha (7 per cent of the total). Some 19 per cent of the area is put down to grass. While suckler cow numbers have remained roughly static, lamb production has contracted by over 50 per cent. Pig enterprises have increased and the number of pigs reared doubled from the year 2000 to reach 65,000 animals in 2009.	National	This is a nationally important area for agriculture which could showcase techniques to target nutrient inputs. It would be difficult to increase agricultural production save through double cropping but more farming could be carried out organically here.	Promote opportunities to encourage sustainable and organic farming and to maintain and improve soils through agri-environment schemes. There are opportunities to increase production levels; these are most likely to come from adoption of precision farming techniques and plant breeding/ modification. Support research into new cultivation practices to protect the soil quality. There is scope for some double cropping where growing seasons allow.	**Food provision** **Water availability** **Regulating water quality** **Climate regulation** **Regulating soil erosion** **Sense of place / inspiration** **Sense of history** **Pollination** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	Semi-natural woodlands Conifer plantations	There are significant areas of woodland, especially on the western scarp. In particular there are large blocks of conifer and mixed plantations on the big estates, managed for timber and game shooting. Total woodland cover is around 10 per cent, of which a third is conifers.	Regional	Commercial timber production takes place on the Sandringham Estate and the other large estates (for example, at Holkham and Houghton). The area of woodland in the NCA is being slightly reduced through initiatives to restore heathland and acid mire from areas which were planted with conifer woodland, as at Dersingham and Grimston Warren, although this loss may be balanced by initiatives under the Woodland Grant Scheme in the west and north of the NCA. Rhododendron has increased greatly in coverage over the past 15 years, but has been successfully removed from some areas.	There are opportunities to improve woodland management for timber while improving biodiversity and enhancing landscape character and providing sustainable heating fuel. Better management could also recreate historic land use, secure employment and benefit the local economy. There are opportunities to retain the variety of different woodland structures and transitions to woodland edge habitats for the benefit of wildlife as well as for providing year-round recreational opportunities. There may also be opportunities to increase the area of woodland within appropriate settings; additional forestry, especially broadleaved and mixed plantations, would not adversely impact the NCA. New woodland planting could be planned to enhance linkages between existing woodlands and to avoid the loss of semi-natural habitats or obscure important field patterns. Opportunities to remove rhododendron should be sought for the benefit of native habitats and species.	**Timber provision** **Biomass energy** **Biodiversity** **Recreation** **Climate regulation** **Sense of place / inspiration** **Sense of history**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability	Chalk aquifers and the Sandringham Sands aquifer The main rivers in the NCA are the Stiffkey, Nar, Burn and the Babingley	A number of chalk aquifers and the Sandringham Sands aquifer underlie the NCA. The River Stiffkey flows from south to north through the NCA from its source at Swanton Novers to the coast and the River Burn rises at South Creake in the north of the NCA, flowing in a northerly direction, before discharging into Overy Creek at Burnham Overy. The River Nar flows east to west across the south of the NCA and the Babingley River which is relatively short, flows west from chalk springs near the village of Flitcham to discharge into the tidal River Great Ouse at Wootton Marshes.	Regional	In the north, part of the chalk aquifer directly overlies the Sandringham Sands but further south a Gault Clay layer separates the two acting as a barrier and preventing the movement of water between the two. These aquifers make a major contribution to public water supply both within the NCA and further afield. Generally in the Catchment Abstraction Management Strategy (CAMS), water availability status for the groundwater management units that make up the aquifers is 'no water available/over licensed'. There is a groundwater unit between Snettisham and Dersingham that has a 'water available' CAMS status[5]. The Sandringham Sands are thought to lie directly under the Chalk with no intervening strata. The Rivers Stiffkey[6] and Nar[5] have an 'over licensed' CAMS status while the Rivers Burn and the Babingley River have a 'no water available' CAMS status. Increasing water abstraction for public water supply and crop irrigation may be affecting springs and seepages feeding the valley mires while rivers, particularly the Nar, are increasingly suffering from low flow conditions. **Continued on next page...**	There are opportunities to adopt innovative and sustainable building and settlement design solutions, particularly using solutions such as sustainable urban drainage and green roofs given scarce water resources and the challenges of climate change. Increasing field margins, creating more permanent grassland, and woodland, more semi-natural habitats would all improve infiltration rates. More permanent grassland within river valleys, could link in with restoring natural watercourses and extending flood plains. Opportunities to mitigate the effects of river engineering. Ensure that water storage reservoirs on farms are constructed in such a way as to incorporate new habitats including marginal vegetation, to enhance biodiversity interest.	**Water availability** **Regulating water quality** **Biodiversity** **Sense of place / inspiration** **Geodiversity**

[5] *The North West Norfolk Catchment Abstraction Management Strategy*, Environment Agency (March 2005)
[6] *The North Norfolk CAMS Annual Update*, Environment Agency (March 2008)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability cont.				**... continued from previous page** The impact of numerous pressures on rivers and associated habitats are very significant. In particular the deepening of rivers and drainage of flood plains has destroyed or damaged many sites. There is a need to plan for a changing climate and possible increased water stress for the NCA's agriculture, public water supplies and wildlife habitats. With the likely increase in longer, drier summers arising from climate change, a demand for more water storage on farms is likely. There is a need to protect aquifers and surface water to ensure that abstractions do not undermine sustainable conservation of wetland and river species and communities.		

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biomass energy	Existing woodland cover Potential plantings	The existing woodland cover of 10 per cent comprises extensive broadleaved woodlands, largely in the estates, and 2,700 ha of conifers. It offers potential for the provision of biomass, both through bringing unmanaged woodland under management and as a by-product of commercial timber production.	Local	In terms of landscape impact, North West Norfolk has a very large open rolling agricultural landscape that is likely to offer considerable opportunities for biomass crops, adding variety to the large arable landscape and screening for some of the development along the coast, although the overall openness should be retained. Rhododendron has increased greatly in coverage in woodland areas over the past 15 years, but has been successfully removed from some areas. Care should be taken not to obscure views of the undeveloped coasts or the view of the landscape from those coasts, and similarly biomass plantings should not cause detriment to historic landscape features, (for example, 18th century or earlier enclosure patterns) or impact on the settings of the Registered Parks and Gardens. The river valley pastures are not suitable for biomass planting as this would compromise their habitat and landscape value. The potential for miscanthus yield is high. Further information on the potential landscape impacts of biomass plantings within the NCA can be found on this website[7].	Exploit the considerable opportunity for short rotation coppice to extend and link existing woodland sites. Work with the farming community to promote the role of biomass crops both as a potential fuel and for its biodiversity value and to protect soil texture. Opportunities to use removed rhododendron for biomass. There are opportunities to contribute to energy security through the provision of low carbon bio fuels and through the husbanding of biomass crops.	**Biomass energy** **Biodiversity** **Sense of place/ inspiration** **Climate regulation**

[7] http://www.naturalengland.org.uk/ourwork/farming/funding/ecs/sitings/areas/default.aspx

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation	Chalk bedrock Woodlands Permanent grasslands and pasture Semi-natural habitats including heathland	The majority of the NCA is underlain by the Chalk. The light sandy and loamy soils under agricultural management offer poor carbon storage potential. This NCA is relatively well-wooded compared with others in Norfolk, and pasture and grassland also contribute to carbon storage, as do peatlands.	Local	Woodlands make the most important contribution to carbon sequestration in the UK. This NCA is relatively well-wooded compared with others in Norfolk and hence provides significant carbon storage resource. In contrast, the light sandy and loamy soils under agricultural management offer poor carbon storage potential: The light soils generally hold less carbon than heavier soils, being more prone to the oxidation of organic material, wind and water erosion, particularly where used for outdoor pig rearing. There may be potential to increase carbon storage capacity through re-naturalising some of the smaller watercourses and reverting to a less intensive pastoral management in their associated valleys and continued heathland reversion on the very light sandy soils around Roydon and Grimston Warren. Massive quantities of carbon were locked up during the creation of the Chalk that underlies this NCA. There is very little extraction or erosion of this rock except at Hunstanton where natural weathering processes are occurring, so this carbon store is currently stable.	In addition, changes to arable cultivation (for example, minimum tillage) will slowly increase soil organic matter. Opportunities to increase the area of permanent grassland, especially where this is linked to more pastoral management of valleys; opportunities to create more semi-natural habitats and increase woodland cover. Opportunities to manage light soils to increase organic content, for example by including fallow periods in rotations, growing green manure crops, and using minimum tillage.	**Climate regulation** **Sense of place/ inspiration** **Biodiversity** **Geodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Rivers and streams River catchments Groundwater	The main rivers in the NCA are the rivers Stiffkey and Nar and the Babingley River. There are smaller rivers including the Burn and there are several streams. The NCA is divided into 23 River Waterbody Catchments which are underlain by the major groundwater bodies: The North Norfolk Coast, North West Norfolk and Sandringham Sands, and the North West Norfolk Chalk. Three other groundwater bodies intersect the NCA to a much smaller extent. The whole area falls within a nitrate vulnerable zone. The catchments that North West Norfolk are in are priority catchments for catchment sensitive farming.	Local	Water quality is a potentially significant issue for this NCA. The biological and chemical water quality for the watercourses within the NCA are good for biological water quality and range from good to very good for chemical water quality. North West Norfolk is an important area for both arable and livestock farming; there is potential for high nitrate and phosphate levels from local agriculture. Soil erosion and sedimentation also transport pollutants to watercourses. The groundwater resource of the NCA is predicted to be of poor qualitative status by 2015, with the exception of the coastal areas close to King's Lynn, although the quantitative chemical status remains good for much of the NCA[8]. Reflecting issues of sedimentation and diffuse pollution, the ecological potential status of all the rivers in the NCA is only 'medium', while the River Stiffkey has a 'poor' ecological potential status. None of the rivers in the NCA have been subject to surface water chemical testing.	There are opportunities to encourage good agricultural practice and the uptake of agri-environment options to protect watercourses and to prevent water quality deterioration caused by diffuse pollution and rapid run-off, such as maintaining the wide field margins and grassland strips along field drains and watercourses to capture sediment and nutrients. The good practices could include ensuring that the use of fertiliser and pesticide is based upon detailed analysis so that inputs match needs. There are opportunities to work with farmers to encourage soil management improvements such as retaining overwintering stubble and increasing organic content by including fallow in rotations to prevent deterioration of water quality caused by soil erosion and nutrient leaching. Opportunities to prevent poaching of land and erosion of banks by livestock.	**Regulating water quality** **Regulating water flow** **Biodiversity** **Sense of place / inspiration** **Regulating soil erosion** **Regulating soil quality** **Geodiversity**

[8] http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=592500.0&y=330500.0&topic=wfd_rivers&ep=map&scale=9&location=Fakenham, Norfolk&lang=_e&layerGroups=default&distance=&textonly=off#x=589754&y=329383&lg=1,7,8,9,5,6,&scale=7

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Rivers and streams Village ponds River catchments Groundwater Operation of natural processes	The main rivers in the NCA are the rivers Stiffkey and Nar and the Babingley River. There are smaller rivers including the Burn and there are several streams. The rivers Stiffkey and Burn in the northern part of the NCA are fast flowing chalk streams, and lend themselves to rapid run-off.	Local	There has been a history of flooding: Tide-locking is a significant issue along the lower reaches of the River Stiffkey while on the River Burn the settlements of South and North Creake are susceptible to flooding and were flooded in July 2004. A targeted maintenance programme is helping keep culverts clear to reduce the risk of blockage here[9]. The impact of numerous pressures on rivers and associated habitats are very significant here. In particular the deepening of rivers and drainage of flood plains has destroyed or damaged many sites. There are also proposals on both the rivers Stiffkey and Burn to reduce bank and channel maintenance to improve flows between the rivers and their flood plain[10]. Flood alleviation is being further reinforced through the River Nar restoration strategy[11] which includes naturalisation of the river channel to help alleviate the risk of flooding downstream in settlements such as King's Lynn. Climate change holds implications for the regulation of water flow here; potential increases in drought and storminess pose opposite but related problems.	There are opportunities to increase the use of river valleys for flood storage, creating permanent grassland and wet pasture, especially along the River Nar. Excess winter rainfall can be diverted into reservoirs for summer use thereby reducing the impact on aquatic habitats and species. There are opportunities to mitigate river engineering to create and extend semi-natural flood plain habitats such as flood meadows, wet woodland and reedbed to alleviate the severity of downstream flood events. There is opportunity to allow the River Nar to flow along a more natural course to reconnect with its natural flood plain. There is much greater potential in the south and south-west of the NCA, where the watercourses have been greatly modified (often to the extent where they are separated from their flood plains), to re-naturalise some of the minor watercourses and reconnect them with their valleys, with consequent benefits in terms of floodwater storage and retention.	**Regulating water flow** **Regulating water quality** **Regulating soil erosion** **Regulating soil quality** **Biodiversity** **Geodiversity** **Sense of place / inspiration** **Sense of history**

[9] *North Norfolk Catchment Flood Management Plan: Summary Report*, Environment Agency (December 2009) [10] Ibid. [11] *Great Ouse Catchment Flood Management Plan: Summary Report*, Environment Agency (January 2011)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil quality	The 'Good Sands' in the east Less fertile soils in the west Permanent pasture Fen peats and alluvial soils in river valleys	The soils of this NCA are predominantly free draining slightly acid loamy soils of low fertility. In the north and west of the NCA the soils are shallow and lime-rich over chalk (covering 34 per cent of the NCA) and are typically shallow and droughty but due to their calcareous nature have a degree of natural resilience. These soils and the freely draining slightly acid loamy soils (27 per cent) and the freely draining slightly acid sandy soils (11 per cent) found in the west of the NCA, are all valuable for aquifer recharge requiring the maintenance of good structural conditions to aid water infiltration and requiring the matching of nutrients to needs to prevent pollution of the underlying aquifer. There is the potential to increase soil organic matter content by management interventions to maintain soil structure. More fertile fen peats and alluvial soils are associated with the river valleys.	Regional	The name 'Good Sands', often applied to the famous soils of the eastern half of this area, derives from the fertility of the versatile light soils which distinguish the area from the low-fertility sands of Breckland to the south. To the west, where some remnant heathland is now found, sandier, less fertile soils cover the chalk and Lower Greensand outcrops where traditionally heathland, commons and warrens occurred, dissected by the west-flowing pastoral river valleys. Thirty four per cent of the soils are typically shallow and droughty, but have a natural resilience due to calcareous nature – but even so, longer drier summers could exacerbate this.	There is the potential to increase soil organic matter content by management interventions and uptake of agri-environment schemes to help maintain soil structure. Priority actions could be to promote good soil management to improve the infiltration of rainwater, to reduce pollution through both fertilizer and pesticide use and by the use of low ground pressure machinery and well-timed cultivation.	**Regulating soil quality** **Regulating soil erosion** **Geodiversity** **Biodiversity** **Sense of place / inspiration**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Soils Hedgerows and tree belts (windbreaks) Woodland, copses, scrub	The dominance of free-draining soils means that all but 3 per cent of the soil types covering the NCA are at high risk of erosion so this is a highly significant issue. Many of the soils (covering 84 per cent of the NCA) are subject to wind erosion. Hedgerows and tree belts play a vital role in preventing soil erosion. Woodlands, copses and scrub also prevent soils from being eroded.	Regional	Many of the soils found in the NCA are also at risk of erosion from surface water run-off where cultivated or bare soil is exposed, particularly on moderately or steeply sloping land. This includes the freely draining loamy soils where erosion is exacerbated where organic matter levels are low after continuous arable cultivation or where soils are compacted. At the same time, other loamy and clayey soils with impeded drainage are prone to compaction and capping/slaking, leading to increased risk of erosion by surface water run-off. These soils need to be managed carefully to reduce risks with careful timing of cultivations and maintenance of vegetation cover. Equally, sandy and loamy soils can be easily eroded by heavy traffic or after heavy rain. Reflecting the high erosion risk, there are four priority catchments under CSF located in the NCA: the North Norfolk Rivers, River Wensum, River Nar, Little Ouse and Thetford Ouse. In the North Norfolk Rivers Priority Catchment (in the north of the NCA and including the rivers Stiffkey and Burn) and the River Nar Priority Catchment (in the south east of the NCA) significant soil erosion is associated with high risk crops (with land left bare during periods of high rainfall). **Continued on next page...**	There are opportunities to encourage outdoor pig enterprises to limit soil erosion and to encourage the sustainable production of crops (for example by minimising bare land, employing and incorporating green cover crops, adopting low ground pressure vehicles, avoiding compaction and slaking of soils) on the area's fragile soils thereby reducing soil erosion. There are opportunities to ensure that soil management plans are in place to prevent soil erosion which leads to sediment run-off and thus deterioration of water quality. There are opportunities to create and enhance hedgerows and shelter belt planting with appropriate species to mitigate erosion and benefit biodiversity. Margins could be created alongside watercourses to trap sediment, more grassland could be created, and there could be minimal cultivation practices, especially on slopes, to avoid leaving soils bare.	**Regulating soil erosion** **Regulating soil quality** **Biodiversity** **Sense of place/ inspiration** **Geodiversity** **Regulating water quality**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion cont.				**... continued from previous page** The River Wensum Priority Catchment (in the north east of the NCA) also suffers from soil erosion due to the generally light soil type with Fakenham, which is just outside the NCA boundary, identified as a target area. Finally, a small section of the Little Ouse Thetford Ouse Priority Catchment is located in the far south of the NCA and this equally suffers from soil erosion on steeper slopes with light soils when there is a lack of crop cover.	Overwintering stubbles could be left and poaching by livestock could be minimised.	
Pollination	Semi-natural habitats Hedgerows Field margins and verges	The habitats in this NCA support a range of insects which pollinate crops and wider flora. Populations of pollinator species may have become isolated due to agricultural practices (commercial plantings separating habitats or agricultural chemical use) or changing climate.	Local	The NCA contains some 30 ha of heathland and some 650 ha of lowland meadows and other semi-natural grassland habitats which support a variety of nectar sources. These habitats provide important nectar sources for pollinating insects. Where arable cropping dominates, field margins, hedges and road verges become the key sources of both pollen and nectar. These habitats are particularly important as they support the insects that pollinate commercial arable crops.	There are opportunities to manage field margins, through agri-environment schemes, in ways that benefit biodiversity in general, farmland birds and pollinating insects and, in particular, pollinators. The area's wide road verges should be maintained by the relevant local authority/ies and there are opportunities to enlist the support of local communities and volunteers. There are opportunities to promote the planting and management of hedges to encourage and provide habitats and food sources for pollinating insects. There are opportunities to increase pollen and nectar resources in arable areas through the establishment of more pollen and nectar strips.	**Pollination** **Biodiversity** **Sense of place / inspiration**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pest regulation	Semi-natural habitats Grass verges Field margins Historic parklands	This NCA has wide field margins and distinctive wide road verges as well as areas of semi-natural habitats and historic parklands where predators of pests can flourish.	Local	Field margins and wide road verges provide important overwintering habitats, as do the historic parklands, for beneficial predatory invertebrates (for example, ground and rove beetles) that feed on pests. Careful management of agro-chemicals (through Integrated Pest Management approaches) may in some cases remove the requirement for chemical intervention, although evidence of efficacy is patchy.	Encourage the establishment of field margins and management of hedges to provide habitats for pest predators. Encourage management of road verges and semi-natural habitats. Financial support for farmers channelled through agri-environment schemes (for example, Environmental Stewardship) can fund these habitats in arable areas.	**Pest regulation** **Food provision** **Biodiversity** **Sense of history** **Sense of place / inspiration**
Regulating coastal erosion and flooding	Hunstanton Cliffs	The only coastal area of NW Norfolk NCA is at Hunstanton where the land rises into cliffs.	Local	Parts of the cliffs are protected by a promenade and sea wall. Current policy is to 'hold the line' which includes sustaining the promenade and seafront, holding the shoreline defences and continuing protection of the town[12]. However, rising sea levels could cause flooding or land loss along the NCA's northern boundary although their saltmarshes are natural barriers that absorb much wave energy.	Opportunities to provide benefits through supporting the operation of natural processes.	**Regulating coastal erosion and flooding** **Geodiversity** **Sense of place / inspiration** **Climate regulation**

[12] *Managing the Coast Summary: The Wash Shoreline Management Plan 2 – Gibraltar Point to Old Hunstanton,* Environment Agency (2009)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
A sense of place/ inspiration	Scots pines Rolling landscape Wide verges Local building stone and style Blocks of woodland The 'Good Sands' Hunstanton Cliffs and views across The Wash Country houses and historic estates The shrines at Walsingham Arable cultivation	A sense of place is provided by the distinct rolling farmed landscape of the chalk plateau and the greensand ridge, with Scots pines, rising from the Fens. The smaller roads in the NCA's interior have distinctive, very wide verges. Blocks of woodland punctuate the landscape. Local buildings are constructed from carstone in the west of the NCA; flint buildings are common further to the east. Blocks of woodland punctuate the landscape. The 'Good Sands' give the characteristic agricultural aspect to the east of the NCA. The colourful carstone and chalk cliffs of Hunstanton are unique. The history of the NCA is inspiring, especially the pilgrimage site of Walsingham and the country estates with their designed parklands and great houses.	Regional	The sense of place of North West Norfolk is most distinct from surrounding NCAs when entering from the west as the greensand ridge rises and the agricultural landscapes give way to rows of Scots pines, woodlands and country estates. Further inland, the rolling topography is dominated by agriculture with large fields, often with wide margins and bounded by trimmed hedges, and quiet roads with wide verges. The 'Good Sands' in the east of the NCA became the most famous farming area in the country in the 18th century, with Lord 'Turnip' Townshend dramatically altering farming techniques and, with it, the landscape. The sense of place is strengthened by the widespread use of local building materials – carstone, flint, and chalk – used in vernacular buildings in the farmsteads and villages. **Continued on next page...**	There are opportunities to maintain views across the rolling landscapes and to increase these views, especially along the western ridge. Opportunities to preserve and enhance the woodlands along the western ridge by ensuring that they are under sound management, working to preserve characteristic species and removing invasive non-natives. Preserve the views across The Wash. Preserve the wide verges and field margins. Encourage the use of local building materials in developments within the villages and work to ensure that any new developments are sympathetic to their surroundings.	**Sense of place/ inspiration** **Sense of history** **Geodiversity** **Recreation**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
A sense of place/ inspiration cont.				**... continued from previous page** The shrine complex of Walsingham, built in the local vernacular and dominating the heart of the village, is a key element of the NCA and adds unmistakeably to the sense of place. Views of the country houses are obscured by boundary walls, and the houses in question are only evident once visitors are within the estates.	Provide interpretation of the geology of the cliffs of Hunstanton.	
Sense of history	Pre-Roman cultivation remains at Ken Hill and Warham The Roman cemetery at Walsingham Castle Rising Castle and Trinity Hospital The shrines at Walsingham The walled country estates Parklands Heaths and commons	There are Pre-Roman cultivation remains at Ken Hill and Warham where there is an Iceni hill fort, and there was much Roman and Saxon settlement here. The Peddars Way was a Roman military road, and there are the remains of a Roman fort at Brancaster. There was a major Anglo-Saxon cemetery at Walsingham and there is much archaeological evidence of occupation from these times at Holme, Thornham and Brancaster. **Continued on next page...**	National	Pre-Roman history is well-evidenced in North West Norfolk, and the Peddars Way was a major Roman military route, and as a well-used National Trail is living history. The 'bastide' – fortified village and castle - of Castle Rising, is tranquil and unchanged enough to retain a strong sense of history, maintained by the continuing tradition that the residents of the historic Trinity Hospital almshouses still attend the Norman village church in their traditional red livery gowns and black hats.	There are opportunities to protect the character and historic resource of the country houses with their estates and designed parklands and their settings, restoring key historic features such as veteran trees and built structures for the history they contribute to the landscape character. Provide access and interpretation where possible where this is not already available.	**Sense of history** **Sense of place/ inspiration** **Recreation** **Biodiversity** **Geodiversity** **Tranquillity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history cont.		**... continued from previous page** The visible history of Castle Rising includes the Castle and Trinity Hospital. The shrines at Walsingham have been a major historic and current draw to the area. The rich ecclesiastical history is also evident from remains of a significant number of priories with scheduled examples at Pentney, Shouldham, Marham, Flitcham, Coxford, Binham, Wormgay, Creake and Blackborough. The walled country estates give a sense of history as well as reinforcing a sense of place. The 'Good Sands' in the east of the NCA became the most famous farming area in the country in the 18th century, with Lord 'Turnip' Townshend dramatically altering farming techniques and, with it, the landscape.		The shrine complex of Walsingham, the heart of the village and a major destination for pilgrims, gives a deep sense of history and tradition, not simply because the buildings are a good architectural fit but because of their purpose, furnishings and imagery. History is also writ large in the large halls and country estates including Houghton Hall and Sandringham. Sandringham's famous and picturesque church is built largely from local carstone as are many other, more modest, traditional village buildings built of carstone or flint and maintaining the link between man, history, and geology. The sense of history makes a strong contribution to a sense of place in the landscape.	Agri-environment schemes could be further used to protect historic farmsteads and buildings and ground features including the bronze- and iron-age cultivations. Promote the use of vernacular materials to repair or renovate traditional buildings, while retaining their historic integrity, and for small developments of new buildings. There are opportunities to investigate ways of securing better management of heritage assets particularly any which are identified as 'heritage at risk' increasing their contribution to the distinctive cultural and physical landscape.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	Low population located in small, dispersed, settlements Few roads	There are areas of high tranquillity away from the more major roads, but traffic along the A148 and – especially - the A149 coast road does intrude on this tranquillity.	Regional	This is an area of contrasts, with those parts of the NCA which adjoin the North Norfolk Coast and The Fens NCAs being quite busy, particularly during the summer months, when the populations of the settlements around the periphery of the NCA become greatly expanded by tourists who enter the area by the A148 and particularly by the A149. Conversely, the 'interior' of the NCA represents some of the most tranquil countryside in the county, with the distance between settlements and low density of roads creating a sense of isolation. In the longer term, the tranquillity of the NCA may be further compromised by increases in road traffic (traffic levels are projected to increase by 30 per cent by 2015) and development.	Seek ways to reduce road noise and to work to reduce traffic levels around the NCA's periphery. Seek opportunities to increase access inland through footpaths and cycling while maintaining the tranquillity the area has at present.	**Tranquillity** **Sense of place / inspiration** **Sense of history** **Recreation**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation	Holiday accommodation Rights of way Peddars Way and Norfolk Coast National Trail Historic ruins such as Castle Rising Castle Large estates, for example Sandringham Woodlands National Nature Reserves Watercourses and angling Hunstanton beach	There is considerable holiday accommodation at Heacham, Snettisham and Dersingham and in the Bed-and Breakfast facilities or holiday cottages of Hunstanton and the villages along the north Norfolk coast. There are few rights of way, with a very low density of only 0.5 km per km2. The Peddars Way and Norfolk Coast National trail is well used by walkers but there are only 726 ha of open access land (covering less than 1 per cent of the NCA). The Peddars Way and Norfolk Coast National Trail is a key access and recreation resource. Many of the large estates have paid access and are a vital part of the local economy as well as major tourist draws. There are attractive woodlands in the NCA. Watercourses are a minor recreational resource, for activities including angling. Shooting is a major recreation activity in this area contributing to the local economy.	National	North West Norfolk is identified as having lower than regional average outdoor access opportunities, which is likely to imply that local people are reliant on travelling further than average (for example, by car) for regular recreation activities such as walking a dog. Some parts of the NCA have high indices of deprivation. The access needs and recreational use of the outdoors by people living in the area are likely to be different to those visiting the area; local people will often avoid honeypot areas during peak visitor use. Those areas which abut The Fens and the North Norfolk Coast NCAs tend to be much more frequented. Visitors to the area typically stay either in the caravans, campsites and beach chalets of Heacham, Snettisham and Dersingham, or in the bed-and breakfast facilities or holiday cottages of the villages along the north Norfolk coast (which are particularly popular with weekenders from London). **Continued on next page...**	Opportunities to improve public transport within the NCA to increase links between caravan and camping sites and the rural interior of the area, and to make access to the interior of the NCA from surrounding areas easier. Opportunities to increase access provision by creating suitable local walks, for instance for dog-owners. There are opportunities for promoting long distance walking along the Peddars Way and Norfolk Coast Path and for promoting good routes for cycling. Enhance historic and natural environment interpretation facilities in key visitor spaces. Promote opportunities to maintain water quality for the benefit of anglers.	**Recreation** **Sense of history** **Sense of place / inspiration** **Tranquillity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation cont.				**... continued from previous page** Key resources include the scenic value of the area, with its coastal views; Sandringham, with its royal connections; Castle Rising Castle and other historic ruins, and the seaside town of Hunstanton. The Norfolk Coast Path National Trail starts at Hunstanton. There is a cohesive although sparse network of 363 km of public rights of way including 40 km of the Peddars Way and the Norfolk Coast National Trail. Sustrans National Route 1 runs through the area from King's Lynn to Wells. Almost 20 per cent of the NCA falls within the Norfolk Coast AONB. Further, intermittent, pressure arises from pilgrims visiting the Marian shrines at Walsingham.	Opportunities to address health problems through recreational access can be provided within the NCA; improved access to local green spaces could provide a potential solution to many of these issues, offering people opportunities to improve their lifestyles, while benefiting from closer interaction with the natural environment.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity	Internationally and nationally designated sites Lowland heathland Flood plain grazing marshes Priority woodland habitats Lowland meadows and fen Parklands with veteran trees and wood pasture Roadside verges Rivers and watercourses	The NCA is bordered to its north and west by two SPAs (The Wash and the North Norfolk Coast), which are also designated as Ramsar sites and SAC; Roydon Common and Dersingham Bog which share the latter two designations, lie within its boundaries. Approximately 1 per cent of the NCA area, 746 ha, is nationally designated as SSSI. Just under 3 per cent consists of priority habitats including 31 ha of lowland heathland, 272 ha of flood plain grazing marsh, 231 ha of purple moor grass and rush pastures,112 ha of lowland calcareous grassland and smaller areas of wet woodland, lowland beech and yew woodland, lowland meadows and fen.	National	Semi-natural habitats within this NCA are few and fragmented. There are a number of internationally important heathlands with acidic mire systems on the Lower Greensand, notably at Dersingham NNR and Roydon Common NNR, Ken Hill and at Ling Common east of North Wootton, although large areas of Ling Common have succeeded to secondary woodland. Roydon Common has recently been threatened by quarrying of silica sand, and air pollution is another pressure on the low nutrient communities that occur there. The impact of numerous pressures on rivers and associated habitats are very significant here. Previously important sites need much stronger protection and require the land around them to be restored in order to provide long-term sustainability. Other smaller areas of heathland habitat and relict heath are concentrated on the sandier soils along the Lower Greensand ridge, in the Sandringham area. These could potentially be connected. **Continued on next page...**	There may be future opportunities to return the woodland of Ling Common to heathland, and to expand the areas of relict heath especially around Sandringham and Syderstone. The deepening of rivers and drainage of flood plains has destroyed or damaged many sites as has quarry dewatering and possibly groundwater abstraction. There are opportunities to protect the sites in question and restore the land around them to provide long-term sustainability. Opportunities to support the inland population of natterjack toads at Syderstone Common and the nightjar populations. Preserve the pingo systems both for their geological and biological interest. Conserve the chalk grassland, especially in the 'Good Sands'.	**Biodiversity** **Geodiversity** **Food production** **Regulating water flow** **Sense of place / inspiration** **Sense of history**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity cont.				**... continued from previous page** Heathland at Syderstone Common, west of Fakenham, contains non-permanent pools which support one of the UK's last inland heath colonies of the internationally important natterjack toad. The heathlands also support a nationally important population of nightjar particularly at Dersingham Bog SSSI. The historic estate parklands are home to important veteran trees and wood pasture. The pingo systems at East Walton and Adcock's Common SSSI are considered to be of outstanding importance in a national context, both for their geological and biological interest. These sites also support areas of chalk grassland. Despite the fact that chalk underlies much of the natural area, chalk grassland is very restricted in distribution. The main concentration is in the 'Good Sands' area to the north at Ringstead, Wells, Cockthorpe and Warham. There are small areas of alkaline fen n the North Norfolk Valley Fens SAC (East Walton Common etc.) and the Wensum SAC within the NCA. In addition, the important arable habitats support nationally important assemblages of arable birds such as grey partridge or turtle dove. Rhododendron is a problem, especially in the woodlands at the west of the NCA.	Support the nationally-important assemblages of farmland birds. Continue to remove rhododendron for the benefit of priority habitats and species. Restore plantations on ancient woodland sites where necessary and protect, manage and buffer ancient woodland sites. Address the structure of woodlands in favour of more broadleaves in plantations. Work to create, manage and improve wetland habitats along river valleys. Manage, expand, buffer and link chalk grassland. Managing hedges, road verges and field margins which provide connecting networks through farmed land.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity	Geological and mixed-interest SSSI Cretaceous bedrock geology Quaternary geology, especially the Pleistocene glacial and periglacial deposits Soils Geomorphology and natural river courses Operation of natural processes	The Cretaceous strata forming the western ridge, coastal cliffs and sloping chalk plateau. Hunstanton Cliffs are designated as a SSSI for their Cretaceous geology. The Quaternary geology of the NCA is of national importance both economically for its high quality sands which are used for glass-making and scientifically for its record of environmental and climate change. The wealth and variety of geology provides opportunities for study and reinforces local distinctiveness and character.	National	Hunstanton Cliffs are famous for their red chalk; the cliffs record a changing climate and environmental conditions during the Cretaceous, when the Earth was experiencing greenhouse conditions. Much carbon was locked up during the formation of the Chalk. There are pingos – shallow periglacial depressions – at East Walton and Adcock's Common SSSI. Other important Quaternary features include Hunstanton Park Esker and the relict cliffs at Dersingham Bog. North West Norfolk has nationally important Pleistocene sediments especially relating to the glacial succession since the Anglian glaciation. North West Norfolk has important mineral resources and is one of the largest producers of silica sand (a highly specialised mineral present in only a handful of localities in England) which is quarried from sites in the Leziate–Bawsey–Middleton–East Winch area. Carstone is quarried at East Winch and Middleton. Sand and gravel is taken from a few sites, primarily from the area to the east and south-east of King's Lynn. **Continued on next page...**	There are opportunities to preserve the stratigraphic sequence at Hunstanton Cliffs, to provide interpretation for the wider public, and to use them as an educational/scientific resource. There are opportunities to preserve faces in quarries or to record temporary sections, and provide access and interpretation where appropriate to disused quarry sites. There are opportunities to designate a suite of Local Geological Sites for their educational, scientific, aesthetic or historical values. There are also opportunities to ensure new development is in keeping with the character of the area by using traditional building materials (carstone, flint and chalk) wherever possible to enhance the sense of place.	**Geodiversity** **Sense of place / inspiration** **Sense of history** **Regulating soil quality** **Regulating soil erosion** **Climate regulation** **Food provision**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity cont.				**... continued from previous page** Roydon Common is one the least damaged valley mire systems in the lowlands outside of the New Forest, and is described in the NCR (1977) as the best 'mixed mire' in the UK. It is still an excellent site, but has recently been threatened by quarrying of silica sand, and air pollution is another pressure on the low nutrient communities that occur there.	There are opportunities to conserve the NCA's soils, especially the 'Good Sands', for both geodiversity and food production. Encouraging watercourses to follow more natural courses so that e.g. the River Nar can reconnect to its flood plain. Opportunities to extract minerals in such a way that important biological sites are not threatened. Restore sand and gravel extraction sites so that they make a positive contribution to the local landscape, geoconservation, establishing habitats and providing access and recreation.	

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