27. Yorkshire Wolds

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www.naturalengland.org.uk
Summary

The Yorkshire Wolds National Character Area (NCA) form an arc of high, gently rolling ground extending from the Humber Estuary west of Hull, to the North Sea coast at Flamborough Head, north of Bridlington. They comprise a prominent chalk escarpment and foothills rising from the Vale of York to the west and the Vale of Pickering to the north, and falling to the plain of Holderness to the east. A very low proportion of the area is urban and woodland, and the vast majority of the land is agricultural. Woodland planting is restricted to small, scattered woodland blocks on higher land and steeper slopes.

This gently rolling landscape instils a sense of openness, escapism and tranquillity provided by the expansive views, sparse population and agriculture. Protection of the rural character and long, open views is important for conservation of this distinctive landscape. Respect for local building vernacular is essential; they are mainly brick, limestone and chalk.

Eastwards, the NCA arcs to meet the North Sea at the high chalk cliffs of Flamborough Head, designated a Heritage Coast which includes several Sites of Special Scientific Interest (SSSIs) and a European Marine Site, where Flamborough Headland is part of the ‘no-take zone’. This means that methods of fishing and extraction of natural materials are prohibited in order to protect marine wildlife and heritage, and to safeguard local fish stocks. It is also a geological SSSI for its spectacular chalk cliffs, a Special Protection Area (SPA) for its breeding coastal birds and a Special Area of Conservation (SAC) for chalk reef and caves. There are coastal footpaths that offer opportunities for coastal recreation, which could be extended in the long term.

The area has a varied cultural and historical heritage, with evidence of extensive settlement from the Neolithic to the Late Medieval Period – the rich prehistoric ritual landscape at Rudston, numerous bronze-age burial mounds, iron-age ladder settlements and deserted medieval villages.

Extensive tracts of arable land dominate the NCA due to the thin, chalky soils and there is some livestock rearing, including pigs, sheep, cattle and chicken. Increased demand for food may bring the introduction of new crops and longer cropping seasons but sustainable farming practices need to be followed to protect water, soil and biodiversity resources.

Because of the underlying permeable chalk, this landscape has no major rivers, but its calcareous waters flow into the river headwaters of adjoining NCAs such as the River Hull in Holderness NCA. The chalk aquifer underlying the NCA supplies drinking water and allows irrigation of arable land but it suffers from pollution and over-abstraction. Calcareous grasslands occur on the steep-sided valleys, which can help to filter water, improving water quality and preventing soil erosion. These grasslands are often species rich and attract many species of butterflies and moths. The Wolds represent the most northerly chalk outcrop in Britain and therefore accommodate the northern extent of the range of many species.
Statements of Environmental Opportunities:

- **SEO 1**: Enhance, extend and manage the unique assemblage of chalk-based habitats (lowland chalk grasslands, streams), broadleaved woodland and maritime cliffs, while protecting the provision and quality of water.

- **SEO 2**: Manage the coastal landscape of Flamborough Head with its diversity of cliffs, geology, geomorphology and habitats (including important seabird colonies), and enhance people's enjoyment of it through increased opportunities for recreation and education.

- **SEO 3**: Improve opportunities to enhance people's enjoyment of the area while protecting high levels of tranquillity by conserving extensive views and intimate, steep-sided valleys which contribute to sense of place, and by protecting and promoting the extensive historic evidence of past human settlement, landscape change and designed landscapes.

- **SEO 4**: Maintain a sustainable but productive arable landscape, while expanding and connecting semi-natural habitats to benefit biodiversity, and soil and water quality by promoting good agricultural practice, extending grasslands along field margins and slopes, implementing extensive grazing regimes, and ensuring compliance with regulations on nitrate vulnerable zones (NVZs) to manage fertiliser inputs.
Description

Physical and functional links to other National Character Areas

The headwaters of the River Hull rise in the Wolds and flow east into the Holderness plain. Streams arising on the northern side of the Wolds, such as Settrington Beck, drain into the Vale of Pickering, and rivers arising on the west drain into the Vale of York. The Humber Estuary National Character Area (NCA) – one of Britain's largest estuaries, draining one-fifth of the land mass of England – lies to the south of this NCA, and the streams that arise in the Wolds eventually drain into the sea through the Humber. Along the elevated chalk ridge, strong visual links with adjacent NCAs create expansive views over Holderness, the Vale of Pickering and the Vale of York.

The coastline extends into the North Sea at Flamborough Head, one of the world's most important fishing grounds, and contains frontal systems that attract fish, birds and cetaceans. The Flamborough Front provides an important marine feeding ground supporting large colonies of seabirds of national and international importance, while the cliffs of Flamborough and Bempton provide their habitats.

Bempton cliffs provide important habitat for colonies of internationally important seabirds such as guillemots and kittiwakes.
Key characteristics

- A large-scale, expansive, rolling landscape with big skies and long views from the escarpment and plateau, contrasting with the more enclosed, dry, sheltered valleys deeply incised into the Chalk, but with small areas of Lower Cretaceous, Jurassic and Triassic rocks along the western and northern fringes.

- Thin, chalky soils support mainly arable farming, with a pattern of large, regular fields crossed by long, straight drove roads with wide verges dating from Parliamentary enclosures of the 18th century. The arable farmland is a priority area for important farmland bird species, while many of the grass verges have calcareous grassland interest providing valuable wildlife corridors.

- The high chalk cliffs of Flamborough Head, where the land meets the North Sea, are designated as Heritage Coast, for the dramatic landscape and recreation value. It is also a European Marine Site, a Special Protection Area (SPA) for breeding coastal birds, and a Special Area of Conservation (SAC) for chalk reef and cave interest, with Sites of Special Scientific Interest (SSSIs) of geological and geomorphological importance.

- Remnant tracts of sheep-grazed, unimproved or semi-improved calcareous grassland in steep-sided, dry valleys form distinctive landscapes, with hillsides of floristically rich grasslands which provide specialist habitats for butterflies and moths.

- Woodland cover is generally limited, and often linked to steep slopes within enclosed valleys, although there are a number of estates with more significant woodland areas, including Dalton, Garrowby, Sledmere, Londesborough and Warter Priory. Shelterbelts associated with farmsteads are features on the skyline.

- There are many large estates and designed parklands with large country houses, estate villages, estate woodlands and medieval deer parks.

- Other features include wet flushes, wet meadows and spring-fed fens at the foot of the escarpments, and remnant wetlands and wet meadows adjacent to the chalk streams.

- It is generally a sparsely settled landscape with large, scattered farmsteads on high ground, small villages in valleys and small market towns on fringes. Building materials are predominantly brick with pantiles, but sometimes limestone and chalk.

- Throughout the NCA, there is extensive evidence of a long history of human occupation and landscape change represented by numerous Neolithic, bronze-age and iron-age monuments and medieval settlements.

- A number of chalk, sand and gravel quarries and gravel pits are found throughout the NCA, which are of biodiversity value and provide access for study and education.
The Yorkshire Wolds today

The Yorkshire Wolds is a deeply rural, predominantly chalk landscape rising in a prominent escarpment from the Vale of York to the west and the Vale of Pickering to the north. From high points above the scarp, the landscape of rolling hills falls away gently to the east, eventually merging into the lower-lying, flatter landscape of Holderness. Along the western fringes of the chalk outcrop, two separate areas of Jurassic and Triassic deposits create a series of foothills to the Wolds. The Chalk creates a range of features which give unity to the whole of the area, including the main escarpment, dry valleys and soil that is thin, dry and white when exposed by ploughing. Unimproved chalk grassland would once have been widespread but is now confined to a few locations on the steepest slopes of the dry valleys.

At its eastern extremity, the chalk reaches the North Sea in the Upper Cretaceous chalk cliffs of Flamborough Head. Designated a geological SSSI, the area comprises the highest chalk cliffs in Britain due to the hardness of the chalk. It is also designated a Heritage Coast accessible via a coastal path, providing tourism and recreation opportunities; an SAC for chalk reef and sea caves; and an SPA for large numbers of breeding seabirds, including kittiwakes and auks, as well as the only mainland breeding colony of gannets in the United Kingdom. The seabirds feed and raft in the waters around the cliffs, outside the SPA, as well as feeding more distantly in the North Sea. The intertidal chalk platforms are also used as roosting sites, particularly at low water and notably by juvenile kittiwakes. Remnant areas of cliff-top grassland are found here and, while agriculture is the main coastal land use, semi-natural, coastal grassland habitats buffer the cliff edge.

The unifying influence of the Chalk gives the whole of the Wolds a particularly strong identity. High on the Wolds plateau, the landscape is large-scale and generally open with big skies being a notable feature. Fields are gently rolling with generally well-maintained but insubstantial hedgerows. Tree and woodland cover is limited, which adds to the sense of openness. The chalk escarpment facing west to the Vale of York and north to the Vale of Pickering is broad and sinuous. In some places, it is intensively farmed but elsewhere woodlands create variety, especially where valleys cut into the scarp. Where the escarpment turns to run due south, it is particularly complex and well-wooded with a strong sense of enclosure.

The large-scale landscape of the Wolds plateau with low woodland cover provides openness, except for scattered shelterbelts often associated with farmsteads.
The Wolds plateau is dissected by numerous deeply incised valleys, which provide a sense of intimacy in contrast to the openness provided high on the plateau. Unimproved chalk grasslands, characteristic of the Wolds, occur on the steep side slopes of the dry valleys, and were once more widespread. Twenty sites are designated as SSSIs, and these are located above Pocklington, around Thixendale and in the north-eastern area at Fordon. They support a mosaic of calcium-loving plant species such as salad burnet, wild thyme and field scabious, and butterflies and moths such as the grayling and cistus forester. There are also many designated Local Wildlife Sites (LWS) throughout the NCA.

Woodland cover is limited with scattered shelterbelts, often providing shelter to the large farmsteads on the plateau, and dale-head plantations. A small number of calcareous ash woodlands are of nature conservation importance, such as Millington Wood which supports rich ancient woodland flora, and clusters of woodland with veteran trees largely occurring on estates and parklands.

The Wolds are home to Britain’s most northerly chalk streams, including the headwaters of the River Hull (SSSI) which flows around Driffield into the Holderness plain. These streams and spring-fed flushes occur in several valleys and along the western escarpment. Abstraction of groundwater from the underlying chalk aquifer has the potential to cause diminished flows in a number of streams. The clear waters of the chalk rivers are a significant nature conservation feature supporting characteristic plant communities, a diversity of invertebrates and the white-clawed crayfish.

The thin, chalky soils, good grazing and light tree cover made the Wolds an attractive area for Neolithic settlers, evidenced by the remains of burial mounds, and defensive and boundary structures. Today, extensive tracts of arable land dominate the landscape, especially on the plateau and gentle slopes of the High Wolds. Field sizes are often large, bounded by well-trimmed hedgerows. A number of declining farmland bird species and a range of rare arable flora occur within the farmland. Overall, agricultural Grades 2 and 3 soils are predominant, and this is reflected in the arable farming which covers 73 per cent of the farmed area. The main crops grown are cereals and oil seeds, with limited livestock rearing but large numbers of pig units.

Generally, the NCA is sparsely populated with villages nestled in valleys or hollows. Traditional buildings in long-established villages are constructed of brick and pantiled roof buildings. Limestone is sometimes used in the west and...
chalk appears in older buildings, notably near Flamborough Head, Flixton and Muston. The villages in the narrow belt of the Jurassic foothills are predominantly built of limestone, with red brick detailing and red pantiles.

In this remote landscape, the Yorkshire Wolds Way National Trail, a long distance route from Hull to Filey Brigg, provides an important recreation opportunity. Long and short walks can be enjoyed throughout the NCA and two national cycle routes pass through: the Way of the Roses, running coast to coast from Morecambe Bay to Bridlington Bay and a circular route known as the Yorkshire Wolds Cycle Route running from Beverley to Market Weighton.

The big skies and a sense of openness high on the Wolds, enhanced by the absence of people and the dark night skies, give a sense of escapism and tranquillity. Where the plateau dips eastwards, long views can be seen over Holderness, while from the scarp slope on the west there are long views out over the Humberhead Levels and Vale of York. The scale and openness of the Wolds has been captured in recent times by renowned artist David Hockney in his popular large-scale landscape paintings such as ‘Bigger Trees Near Water’.

The landscape through time

The portion of the Chalk Group remaining in the Yorkshire Wolds represents strata deposited during the Upper Cretaceous between approximately 100 million and 80 million years ago. Older rocks – Triassic and Jurassic in age – underlie the Chalk Group and crop out to the north and east. Exploitation of the Chalk Group for lime, cement, building stone, brick and aggregate has created inland exposures where these rocks are visible. Several of these exposures have been designated as SSSIs because of their importance to the earth sciences. The most extensive and comprehensive exposures are, however, the cliffs of Flamborough Head SSSI.

Along the western edge of the NCA, the contrasting outcrop of mudstones, sandstones and limestones produce low escarpments and hills. Pleistocene coversands, which are present in the south, produce light, sandy soils, while tills resting on chalk in the Flamborough area give rise to the bevelled cliff tops. At Market Weighton in the neighbouring Holderness NCA, an important geological structure caused most of the Jurassic sequence of rocks to thin out, leaving only the lowermost (Lias Group) beds. They reappear approximately 10 km to the north. North of Market Weighton, these underlying rocks are folded, creating a complex area of foothills, while further south is a clear escarpment.
The thin, chalk soils, good grazing and light tree cover of the Wolds, combined with the availability of stone suitable for making tools, made this an attractive area for early Neolithic settlers. There is evidence of widespread settlement at that time in the remains of burial mounds, as well as defensive and boundary structures.

The Wolds have rich evidence of prehistoric occupation and land use with internationally important Neolithic ritual landscapes, numerous bronze-age burial monuments, and iron-age square barrow cemeteries, ladder settlements and earthwork boundaries. There were recurrent periods of settlement in Roman, Saxon, Danish and Norman times. Many of the medieval settlements on the Wolds were deserted or shrunk due to movement of people and changes in land use. Settlements deserted in the Medieval Period survive as earthwork sites such as Hanging Grimston, and many of today’s villages shrunk rather than disappeared altogether, such as Huggate.

The Wolds have been continuously modified since Neolithic times. Until about 1700 AD, much of the area was still unenclosed open fields, predominantly sheepwalks and pastures. Daniel Defoe at this time likened the landscape to the more southerly chalk landscape of the Downs around Salisbury. There were few, if any, hedges or walls and virtually no settlement, at least on the hills and plateau.

Parliamentary enclosure of these open-field landscapes came rather later to the Wolds than to the adjacent vale landscapes of Holderness and the Vale of York. When enclosure came, it brought many of the features of today’s landscape; hedges were planted to enclose large, regular fields; new large, brick-built farmsteads appeared scattered across the open farmland and well away from traditional villages and roads and, because of their exposed position, they were often surrounded by distinctive shelterbelts. New straight, wide drove roads were also built with wide grass verges. All of these features can still be seen today.

In the Wolds, the absence of surface water resulted in the most significant settlements establishing around the fringes and along the spring lines to east and west, especially in the Great Wold Valley. The presence of ponds was at one time essential for the survival of the valley villages and a number of these remain, including dew ponds on the dry plateau. The villages are usually predominantly brick-built, with pantile roofs, although limestone is sometimes
used in the west. Chalk also appears in many older buildings, notably near Flamborough Head which is one of the few areas where the chalk is hard enough for building. There are also estate villages, many with prominent churches associated with the parkland and estate landscapes of the country houses, which often include deer parks and estate woodlands developed in the 18th and 19th centuries. Notable examples include Sledmere, South Dalton and Warter.

Outside the villages, in the Parliamentary enclosure period, imposing brick farmsteads are typical features dispersed across the plateau. The villages in the narrow belt of Jurassic foothills are predominantly stone built. The traditional building material here is limestone with red brick detailing and red pantiles. Many of the villages have particular strength of character because of the combination of traditional stone buildings with mature trees and old features such as market crosses, greens and drystone boundary walls.

The well-drained, productive, chalk soil has suited arable farming. The most extensive uptakes in agri-environment schemes up to 2003 related to calcareous grassland and regeneration of grassland/semi-natural vegetation. Higher land within the western and northern areas has seen an increase in woodland planting, with several small, scattered woodland blocks being planted on upper slopes between 1999 and 2003. Other recent changes include wind farm developments.

### Ecosystem services

The Yorkshire Wolds 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 Yorkshire Wolds NCA is contained in the ‘Analysis’ section of this document.

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

- **Food provision:** The NCA is important for food production. Arable farming dominates the NCA, with 100,291 ha being the total farmed area for cereal production and 81 per cent of the farmed area being dominated by large estates. The largest numbers of livestock are pigs, totalling 139,502 animals.
Water availability: Although this is a dry landscape, it is an important catchment as the underlying chalk aquifer supplies water to the Yorkshire and Humber region; the eastern coastal part of the aquifer is over-licensed which could affect the river flows of adjoining NCAs.

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

Regulating soil erosion: The most vulnerable areas regarding soil erosion are on the steep valley slopes under arable production, particularly at times when there are high-intensity downpours when crops are establishing or during harvesting. Prevention involves increasing green cover crops such as extending grasslands on field margins and slopes.

Regulating soil quality: Some 49 per cent of the NCA has high-quality Grade 2 agricultural soils on gently sloping hills of the eastern slopes; cultivation practices need to address the organic content of soils, such as by extending grasslands where appropriate and ensuring that nutrient inputs are carefully managed, adhering to nitrate vulnerable zone (NVZ) guidelines.

Regulating water quality: The chemical quality of groundwater (including the chalk aquifer) is classified as poor throughout the NCA. The reduction of diffuse agricultural pollution through nitrates will improve the quality of groundwater and northerly chalk streams.

Cultural services (inspiration, education and wellbeing)

Sense of place/inspiration: The strong sense of place is evoked by the expansive rolling hills and long views which instil a sense of openness contrasted with enclosed, hidden, steep-sided valleys. The strong rural character of the area, along with its light settlement patterns, gives it a sense of remoteness. In the east, the coastline is rugged and dramatic with expansive sea views at Flamborough Head and Bempton.

Sense of history: There is a strong sense of history across the Wolds from the prehistoric monuments and extensive evidence of human land use from the Neolithic Period, to the 18th-century enclosure landscape of today. The Wolds has a higher than average number of Scheduled Ancient Monuments, a strong collection of listed buildings and six registered parks and gardens such as Sledmere House and Londesborough Park.
Recreation: Although there is a low density of public rights of way, there are recreational opportunities through the Yorkshire Wolds Way, and the two national cycle routes – the Way of the Roses and the Yorkshire Wolds Cycle Route. Shorter, circular routes and easy-access walks are also established and have the potential to increase over time by making more links from permissive paths and bridleways to the main walking routes.

The coastline of Flamborough is popular with visitors and includes the RSPB Bempton Cliffs Nature Reserve, which is visited for its high numbers of breeding seabirds and interesting sea caves. The introduction of the Coastal Access Scheme may provide an opportunity to extend the National Trail designation from Filey to Speeton (which includes Flamborough Head). The large estates of Sledmere and Burton Agnes offer visitors a cultural, historical and recreational experience.

Geodiversity: There are eight geological SSSIs, four of which contain designated biological interests. Most of these are exposed chalk quarries providing insights into the deep past and sources of fossils. The most extensive natural geodiversity site is Flamborough Head SSSI which provides a spectacular backdrop and habitat. These Upper Cretaceous chalk cliffs of Flamborough Head and Bempton include Staple Newk, a fault line which is visible from the sea. Bempton itself comprises the highest of the chalk cliffs in Britain, reflecting the fact that the chalk in this area is much harder than that of southern Britain. A common feature of the Chalk sequence is the presence of bands of marl, a calcareous mudstone. As on the coast, geology and geomorphological processes are significant factors influencing the topography and hydrology of the area.
Statements of Environmental Opportunity

**SEO 1:** Enhance, extend and manage the unique assemblage of chalk-based habitats (lowland chalk grasslands, streams), broadleaved woodland and maritime cliffs, while protecting the provision and quality of water.

For example, by:

- Enhancing biodiversity and strengthening landscape character by protecting and expanding the extent of species-rich chalk grasslands, creating grasslands to buffer key sites while reducing nutrient influences from cultivated land, and creating or restoring broadleaved woodland where appropriate.
- Creating and managing grassland buffer strips along watercourses and consider reverting arable land to grassland on steeper slopes to reduce soil erosion and nutrient run-off in arable areas, and to create buffers and links to existing sites of biodiversity interest, particularly those adjacent to the tributaries of the River Hull draining to the east.
- Restoring and enhancing riverside wetland habitats on narrow valley floors, and retaining areas of extensively managed wet grasslands, especially across the floor of winterbourne channels and relict small-scale field patterns.
- Enhancing/improving chalk-based aquatic habitats by managing rivers, streams and flushes to maintain hydrological processes, enhance water quality and provision, and maintain the biodiversity of related plant and invertebrate communities.
- Maintaining and improving the chalk aquifer for public water supply, its long-term resilience and water storage, by working with the local farming community to adopt sustainable farming practices and to improve filtration into the ground and reduce nutrient run-off through the creation or restoration of a network of grasslands.
- Seeking out opportunities for biodiversity enhancement from mineral extraction sites, for example by the creation of chalk grassland through suitable restoration schemes and managing disused chalk quarries such as Kiplingcotes for their biodiversity value.
- Seeking out opportunities for discovering more Local Geological Sites and improving access to sites for education and recreation.
- Seeking opportunities to buffer, connect and expand semi-natural habitats by planting nectar-rich seed mixes and grassland strips, and by managing roadside verges to create an ecological network, linking habitats where possible and benefiting a wealth of wildlife, including skylarks, butterflies and moths (marbled white, brown argus and cistus forester).
- Through landscape-scale partnerships, undertaking joint initiatives in the adjoining National Character Areas (NCAs) to protect the water quality and supply of groundwater of the northerly chalk streams of the Yorkshire Wolds and the headwaters in adjoining NCAs into which they flow.
For example, by:

- Seeking opportunities to restore, expand and improve ecological links between chalk grassland on the cliff tops of Flamborough Head through agri-environment options and to maintain them through extensive grazing regimes.
- Protecting the coastal spring flushes of significant botanical interest on the Flamborough Headland.
- Protecting and positively managing geological and geomorphological features, including exposures, disused quarries, landforms and river processes.
- Maintaining the habitats for populations of migratory bird species (kittiwake) and seabirds that contribute to the breeding seabird assemblage of European importance, with particular reference to maintaining the coastal cliffs, chalk reefs and sea caves and ensure links with implementation of the Flamborough Head European Marine Site management scheme.

- Managing the Heritage Coast at Flamborough Head and Bempton, enabling the local community and visitors to enjoy access, good facilities and opportunities for recreation and to enjoy the interpretation of the unique geological heritage and wildlife of the coast.
- Expanding the coastal path to link to the Cleveland Way (Filey to Speeton) as part of the Coastal Access Scheme.
- Allowing the natural retreat of the cliff line at Flamborough Head, thus enabling internationally designated sites to evolve under natural processes.
SEO 3: Improve opportunities to enhance people's enjoyment of the area while protecting high levels of tranquillity by conserving extensive views and intimate, steep-sided valleys which contribute to sense of place, and by protecting and promoting the extensive historic evidence of past human settlement, landscape change and designed landscapes.

For example, by:

- Encouraging more people to visit the distinctive open countryside for quiet enjoyment and by developing new educational ‘tracker packs’, reconnecting people with the importance of the landscape, geodiversity and biodiversity for provisioning and cultural services, along with new educational access sites linked to the Yorkshire Wolds Way, Way of the Roses and Yorkshire Wolds Cycle Route.

- Ensuring that significant built developments do not adversely impact on the historic interest, recreational enjoyment and open character of the area, helping to maintain panoramic views and a sense of ‘escapism’ on the distinctive chalk topography, particularly the escarpment.

- Maintaining the lightly settled character and traditional settlement pattern of medieval villages traditionally located along spring lines, and later, estate villages and scattered farmsteads.

- Encouraging the use of traditional building materials (brick and pantiled roof buildings, with limestone to the west and chalk near Flamborough Head), to retain the connection between the local vernacular and the underlying geology, and restoring and maintaining existing traditional buildings of brick, chalk or cobble barns and model/stud farms.

- Improving access to and interpretation of historic sites and features for local communities and visitors to understand and enjoy the heritage surrounding them, and revealing their role in the development of the landscape over time.

- Maintaining the visible and hidden finite resource of past human landscape change, land use and settlement – for example, the extensive prehistoric, ritual landscapes, later iron-age and medieval settlements, and 18th-century landscape reorganisation.

- Managing medieval deer parks and post-medieval designed parkland associated with the large estates, including restoration of vistas and care of veteran trees.

- Improving and extending access to recreation for a wide range of users by developing shorter circular routes linked to historic sites, cycle routes, bridleways and National Trails, and by introducing educational packs for schoolchildren.
For example, by:

- Encouraging farmers and landowners in the Yorkshire Wolds (and immediately adjoining NCAs) to restore and create semi-natural habitats to improve water infiltration and reduce nitrate input – for example, through take-up of environmental stewardship arable options, extending grasslands along field margins and slopes to prevent sediment run-off, and improving water quality, biodiversity and pollination.

- Encouraging management interventions on arable farmland to benefit farmland bird species such as grey partridge, lapwing, turtle dove, yellow wagtail, tree sparrow, corn bunting, quail, barn owl and yellowhammer.

- Developing an integrated package of catchment sensitive farming initiatives along the headwaters of the River Hull and Settrington Beck/River Derwent.

- Promoting good management of existing hedges and hedgerow trees, filling in gaps and allowing them to fill out.

- Improving soil and crop management by encouraging the practice of increasing green cover crops such as grasslands on cultivated or bare soil of steep slopes and field margins, and by encouraging extensive grazing regimes on soils most vulnerable to compaction.

- Conserving archaeological features through land management practices – for example, through reversion of arable to grassland where land management threatens the integrity of earthworks and below-ground archaeology and by encouraging scrub removal on earthworks (Neolithic, bronze and iron-age monuments).
Additional opportunities

Create new native woodlands to extend the habitat network, while respecting open views of the NCA, linking these areas to other woodlands, semi-natural habitats, scrub, hedgerows and species-rich grassland.

For example, by:

- Where appropriate, creating new native, calcareous ash woodlands to link with the existing resource and with hedgerows, while carefully avoiding potentially impacting on semi-natural, species-rich grassland.
- Bringing existing woodlands into appropriate active management.
- Identifying barriers to movement between woodland patches and close these links where appropriate with natural regeneration, new native planting of woodland or hedgerows and allowing scrub to develop in non-species-rich grassland.
- Maintaining diverse woodland structures in calcareous ash woodlands and, where appropriate, supporting the practice of coppicing.

- Ensuring that new woodlands are created in appropriate places so that they contribute to landscape character, thus providing shelter for farmsteads and avoiding enclosing the open plateau areas or intruding on skylines.
- Creating riparian woodland along watercourses and wider catchment planting on the lower eastern slopes to help promote rainfall infiltration into the soil, reducing water pollution and sediment run-off.
1. Landscape and nature conservation designations

The Yorkshire Wolds NCA includes the Flamborough Headland Heritage Coast covering 3,170 ha or 3% of the NCA area.

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

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<th>Tier</th>
<th>Designation</th>
<th>Name</th>
<th>Area (ha)</th>
<th>% of NCA</th>
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<td>Humber Estuary</td>
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<td>Site of Special Scientific Interest (SSSI)</td>
<td>A total of 38 sites wholly or partly within the NCA</td>
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</table>

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 282 Local sites in Yorkshire Wolds NCA covering 3,493 ha which is 3% 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](http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm)

Details of Local Nature Reserves (LNR) can be searched at: [http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp](http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp)

Maps showing locations of Statutory sites can be found at: [http://magic.defra.gov.uk/website/magic/](http://magic.defra.gov.uk/website/magic/) – select ‘Rural Designations Statutory’

### 1.1.1 Condition of designated sites

A breakdown of SSSI condition as of March 2011 is as follows:

<table>
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<th>SSSI Condition Category</th>
<th>Area (ha)</th>
<th>Percentage of NCA SSSI Resource</th>
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<td>Favourable</td>
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</tr>
<tr>
<td>Unfavourable no change</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>Unfavourable recovering</td>
<td>676</td>
<td>67</td>
</tr>
</tbody>
</table>

Source: Natural England (March 2011)

Details of SSSI condition can be searched at: [http://www.sssi.naturalengland.org.uk/Special/sssi/reportindex.cfm](http://www.sssi.naturalengland.org.uk/Special/sssi/reportindex.cfm)

### 2. Landform, geology and soils

#### 2.1 Elevation

The maximum height of the hills is around 250 m dropping down to sea level at Flamborough Head and the Humber Estuary.

Source: Natural England (2012)

#### 2.2 Landform and process

The Wolds form a long ridge of rolling hills. The scarp slope rises steeply from the Vale of Pickering to the north and the Vale of York and Humberhead Levels to the west. The dip slope grades gradually into the Holderness Plain to the east.

Source: Yorkshire Wolds Countryside Character Area Description

#### 2.3 Bedrock geology

The Yorkshire Wolds is largely underlain by the Chalk Group deposited during the Late Cretaceous between 100 and 65 million years ago, with earlier Jurassic and Triassic rocks at the base along the western escarpment and Jurassic and Lower Cretaceous rocks along the northern escarpment. The most important geological feature of the area is the Market Weighton Axis, over which most of the Jurassic strata diminish for around 10 km, leaving only the basal Lias Group rocks.

Source: Yorkshire Wolds Countryside Character Area Description
2.4 Superficial deposits
There is relatively little in the way of superficial deposits over much of the NCA. Till and glacial outwash are present in the Flamborough area and also along the western margin of the NCA, where a small area of coversands is present in the south.

Source: Yorkshire Wolds Countryside Character Area Description

2.5 Designated geological sites

<table>
<thead>
<tr>
<th>Tier</th>
<th>Designation</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>Geological Site of Special Scientific Interest (SSSI)</td>
<td>4</td>
</tr>
<tr>
<td>National</td>
<td>Mixed Interest SSSIs</td>
<td>4</td>
</tr>
<tr>
<td>Local</td>
<td>Local Geological Sites</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Natural England (2011)

*Local sites are non statutory designations

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
Shallow lime-rich soils over chalk, cover 46% of the NCA; whilst freely draining lime-rich loamy soils cover 29%. These soil types allow easy cultivation and produce high grade agricultural land characteristic of the area and suitable for arable farming. The southern area on the coversands has poorer soils producing lower grade agricultural land.

Source: Natural England (2010)

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

<table>
<thead>
<tr>
<th>Grade</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Grade 2</td>
<td>54,627</td>
<td>49</td>
</tr>
<tr>
<td>Grade 3</td>
<td>47,903</td>
<td>43</td>
</tr>
<tr>
<td>Grade 4</td>
<td>6,776</td>
<td>6</td>
</tr>
<tr>
<td>Grade 5</td>
<td>459</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Non-agricultural</td>
<td>735</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Urban</td>
<td>856</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

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.

- Gypsey Race 23 km
- Kelk Beck 3 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 NCA has no major rivers running through it though streams flow east to join the River Hull headwaters in the Holderness Plain and north and west to join the River Derwent. Indeed, these important headwaters begin in the Yorkshire Wolds. The permeable chalk produces many dry valleys and little surface water. Man-made dew ponds for watering livestock are characteristic of the area. Water resurfaces as springs and feeds chalk streams - the most northerly in Britain.

3.2 Water quality
The total area of nitrate vulnerable zone (NVZ) is 107,913 ha, 97% 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:

4. Trees and woodlands

4.1 Total woodland cover
The NCA contains 4,953 ha of woodland (4% of the total area), of which 243 ha is ancient woodland.

Source: Natural England (2010)

4.2 Distribution and size of woodland and trees in the landscape
The NCA is sparsely wooded on the open Wolds with very few hedgerow trees. Scattered shelter belts and plantations often planted close to post enclosure farmsteads consist mostly of ash, beech, sycamore or larch. Distinct clusters of woodland occur on the foothills of the western scarp above Pocklington, around Londesborough Park and some other large estates. Along the northern escarpment, recent conifer plantations have been established. A handful of sites appear to have long continuity of woodland cover such as Millington Wood. Small but important pockets of wet woodland can be found alongside Gypsey Race. The western escarpment with its sandier soils has a higher proportion of woodland which includes birch, oak and planted Scots Pine. There has been significant new planting of small scattered woodland blocks on higher land and steeper slopes in the west and north, and woodlands with Woodland Grant Scheme management agreements have increased.

Source: Yorkshire Wolds Natural Area Profile (1997)
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):

<table>
<thead>
<tr>
<th>Woodland type</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaved</td>
<td>2,077</td>
<td>2</td>
</tr>
<tr>
<td>Coniferous</td>
<td>469</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Mixed</td>
<td>1,960</td>
<td>2</td>
</tr>
<tr>
<td>Shrub / young trees</td>
<td>384</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Felled/land for prepared planting</td>
<td>63</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

Source: Natural England (2010)

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient semi-natural woodland</td>
<td>34</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Planted Ancient Woodland (PAWS)</td>
<td>210</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>


5. Boundary features and patterns

5.1 Boundary features
Hedges and hedgerow trees remain an important feature of the landscape, and in some places, they are low and tightly trimmed. Hedgerows planted as part of the Parliamentary enclosures border a pattern of straight, wide drove ways with wide verges.

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

5.2 Field patterns
A combination of hedges and fences enclose large, regular shaped fields dating back to Parliamentary enclosure. The open wolds consist of large, gently rolling arable fields whereas the western edge of the escarpment has smaller field patterns.

Source: Yorkshire Wolds 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
Holdings are predominantly arable with 274 cereal holdings (38%) and 205 general cropping holdings (28%). Between 2000 and 2009, numbers of cereal and general cropping holdings have decreased by 8% and 12% respectively.

Source: Agricultural Census, DEFRA (2010)

6.2 Farm size
Farm size is generally large, with over 60% of farms above 50 ha, accounting for 95% of the farmed land. There are only 62 holdings under 5 ha. Between 2000 and 2009, numbers of larger holdings (those over 100 ha and 50-100 ha have decreased by 14% and 8% respectively, whilst smaller holdings between 20-50 ha have increased by 19%.

Source: Agricultural Census, DEFRA (2010)

6.3 Farm ownership
In 2000 the total farmed area was 102,607 ha with 65,597 ha (63%) farmed by the owner. By 2009 the total farmed area was 100,291 ha with 68,244 ha (68%) farmed by the owner.

Source: Agricultural Census, DEFRA (2010)

6.4 Land use
55% (55,555 ha) of the farmed area is used for cereal crops, while another 18% (17,865 ha) is used for oilseeds, cash roots, stock feed and other arable crops. 18% of the land is grass and uncropped land covering 18,262 ha of the farmed area; this has decreased since 2000 from 23,363 ha. Vegetables are grown on 4% (4,428 ha) of the land; this has decreased from 5,000 ha in 2000.

Source: Agricultural Census, DEFRA (2010)

6.5 Livestock numbers
In 2009, there were 139,500 pigs (mainly indoor reared) which represents a reduction in numbers from 171,200 (19%) in 2000. There are 51,700 sheep and 26,200 cattle, which between 2000 and 2009 have decreased in numbers from 92,900 (44%) and 32,100 (18%) respectively. These figures show a significant decrease in numbers of sheep livestock by 44% over the 10 year period.

Source: Agricultural Census, DEFRA (2010)

6.6 Farm labour
In 2009, most holdings were managed by principal farmers (1,133), a decrease of 176 (13%) since 2000. However, salaried managers have increased from 103 to 117 (14%) over this 10 year period.

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

Chalk grassland, once predominant over much of the NCA, is reduced to 1% of the land with main concentrations found in the karst valleys above Pocklington, around Thixendale and in the north-east. It comprises a mosaic of plant communities from tall, tussocky swards dominated by tor-grass to the short, herb-rich turf of well-grazed sheepwalks which support butterflies and moths such as the marbled white, brown argus and cistus forester.

Springs and flushes fed by calcareous groundwater occur in some of the valleys, on the scarp slopes and along the coastline supporting species such as marsh valerian, marsh marigold and sedges. These springs are sometimes the source of chalk streams supporting distinctive invertebrate communities whilst constantly-flowing streams support water-crowfoot beds as they descend into the surrounding plains. Some, such as the Gypsey Race running east towards Bridlington, have seasonal flows and are known as winterbournes.

A few flushes also appear on the coastal strip, a good example being Hoddy Cows Spring SSSI near Speeton. Here water rises through boulder clay from the underlying chalk aquifer; a rich flush flora features bog pimpernel, bogbean and butterwort. Flushes on the Flamborough Headland are of significant botanical interest. The NCA contains Britain’s most northerly chalk streams including the headwaters of the River Hull which flow from the chalk above Driffield into the Holderness plain, and Settrington Beck which descends the northern scarp into the Vale of Pickering to join the River Derwent. Beds of stream water-crowfoot are the most characteristic vegetation of the constantly-flowing reaches of these watercourses with lesser water parsnip, water-cress and water starworts where the flow slackens. The headwaters also support populations of water voles.

The NCA is sparsely wooded but there are a small number of calcareous ash woods of nature conservation importance such as Millington Wood which supports a rich ancient woodland flora. The nationally scarce baneberry grows at this and a handful of other sites.

Arable farmland supports important species of farmland birds such as grey partridge, lapwing, turtle dove, yellow wagtail, tree sparrow corn bunting, quail, barn owl and yellowhammer.

Source: Yorkshire Wolds Natural Area Profile
27. Yorkshire Wolds

7.2 Biodiversity Action Plan (BAP) priority habitats
The NCA contains the following areas of Biodiversity Action Plan (BAP) mapped priority habitats (as mapped by National Inventories). Footnotes denote local/expert interpretation. This will be used to inform future National Inventory updates.

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad-leaved mixed &amp; yew woodland</td>
<td>2,122</td>
<td>2</td>
</tr>
<tr>
<td>(broad habitat)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowland calcareous grassland</td>
<td>1,073</td>
<td>1</td>
</tr>
<tr>
<td>Lowland meadows</td>
<td>194</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Lowland dry acid grassland</td>
<td>113</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Fens</td>
<td>96</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Reedbeds</td>
<td>96</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Maritime cliff and slope</td>
<td>84</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Purple moor grass and rush pasture</td>
<td>6</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Mudflats</td>
<td>1</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

Source: Natural England (2011)

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

8. Settlement and development patterns

8.1 Settlement pattern
Relatively sparsely populated with villages located few and far between, often nestled in valleys or hollows. There is a very distinct line of small villages along the Great Wold Valley following the spring line. A cluster of development occurs west of Wetwang, along the axis of the A166 with expansion along the A63 corridor and around existing large settlements.

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

8.2 Main settlements
The NCA has low levels of dispersed settlement, dominated by nucleated villages and small towns, some of which follow key valleys. The largest settlements lie close to the border of the NCA being, Market Weighton, Bridlington and Driffield. The total estimated population for this NCA (derived from ONS 2001 census data) is, 53,706.

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

8.3 Local vernacular and building materials
Traditional buildings, mostly dating from mid 18th century, are brick, with limestone to the west and chalk near Flamborough Head. Along the scarp, foot buildings are predominantly stone-built with a vernacular based on limestone with red brick detailing and red pan tiles.

Source: Yorkshire Wolds Countryside Character Area description; Countryside Quality Counts (2003)
9. Key historic sites and features

9.1 Origin of historic features
Extensive evidence for Neolithic / Bronze Age / Romano-British settlement, including long and round barrows, and evidence from crop marks, especially to western fringe, in the Great Wold Valley and around Rudston. High proportion of enclosure by parliamentary act between mid 18th century and 1815. Remnants of medieval settlements, notable examples being Wharram Percy and Thixendale Park. Establishment of parks marked from 16th century (Sledmere House, Dalton Hall, Londesborough Park, Houghton Hall, Scampston Hall and Risby Hall). Churches and chapels of all periods, this area having the greatest concentration of Methodist chapels outside Cornwall and a fine group of Victorian churches (by JL Pearson and Temple Moore) built on the Sledmere estate.

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

9.2 Designated historic assets
This NCA has the following historic designations:

- 6 Registered Parks and Gardens covering 934 ha
- 0 Registered Battlefields covering 0 ha
- 428 Scheduled Monuments
- 717 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

- 2% of the NCA 1,958 ha is classified as being publically accessible.
- There are 591 km of Public Rights of Way at a density of 0.5 km per km².
- There are 117 km of National Trail (Yorkshire Wolds Way National Trail) within the Yorkshire Wolds NCA.

Sources: Natural England (2010)

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

<table>
<thead>
<tr>
<th>Access designation</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Trust (Accessible all year)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Common Land</td>
<td>2</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Country Parks</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CROW Access Land (Section 4 and 16)</td>
<td>1,566</td>
<td>1</td>
</tr>
<tr>
<td>CROW Section 15</td>
<td>16</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Village Greens</td>
<td>9</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Doorstep Greens</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Forestry Commission Walkers Welcome Grants</td>
<td>2</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Local Nature Reserves (LNRs)</td>
<td>198</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Millennium Greens</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Accessible National Nature Reserves (NNRs)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Agri-environment Scheme Access</td>
<td>71</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Woods for People</td>
<td>90</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

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) a large proportion of the NCA has a strong sense of tranquillity due to its elevated views, lack of visual intrusion and sparse settlement patterns including lack of large cities and towns. Tranquillity is reduced along the A166 and A165, and in the south near Hull and other settlements on the Humber Estuary.

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

<table>
<thead>
<tr>
<th>Category of tranquillity</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest value within NCA</td>
<td>45</td>
</tr>
<tr>
<td>Lowest value within NCA</td>
<td>-50</td>
</tr>
<tr>
<td>Mean value within NCA</td>
<td>12</td>
</tr>
</tbody>
</table>

Sources: CPRE (2006)

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

11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are ‘intruded on’ from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows that a large proportion of the NCA (78%) remains undisturbed. A breakdown of intrusion values for this NCA are detailed in the table below.

<table>
<thead>
<tr>
<th>Category of intrusion</th>
<th>1960s (%)</th>
<th>1990s (%)</th>
<th>2007 (%)</th>
<th>% change (1960s-2007)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disturbed</td>
<td>3</td>
<td>14</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>Undisturbed</td>
<td>96</td>
<td>85</td>
<td>78</td>
<td>-18</td>
</tr>
<tr>
<td>Urban</td>
<td>n/a</td>
<td>n/a</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are a small increase in urbanisation and disturbed land. However a high proportion of the NCA remains largely undisturbed.

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

- Joint Character Area GIS boundaries, Natural England (data created 2001)
- National Parks and AONBs GIS boundaries, Natural England (2006)
- Countryside Quality Counts Draft Historic Profiles, English Heritage (2004)*
- BAP Priority Habitats GIS data, Natural England (March 2011)
- Special Areas of Conservation data, Natural England (data accessed in March 2011)
- Special Protection Areas data, Natural England (data accessed in March 2011)
- Ramsar sites data, Natural England (data accessed in March 2011)
- Sites of Special Scientific Interest, Natural England (data accessed in March 2011)
- Source protection zones, Environment Agency (2005)
- Public Rights of Way Density, Defra (2011)
- National Trails, Natural England (2006)
- National Tranquillity Mapping data, CPRE (2007)
- Intrusion map data, CPRE (2007)
- Registered Battlefields, English Heritage (2005)
- Record of Scheduled Monuments, English Heritage (2006)
- Registered Parks and Gardens, English Heritage (2006)
- World Heritage Sites, English Heritage (2006)
- Incorporates Historic Landscape Characterisation and work for preliminary Historic Farmstead Character Statements (English Heritage/Countryside Agency 2006)

Please note all figures contained within the report have been rounded to the nearest unit. For this reason proportion figures will not (in all) cases add up to 100%. The convention <1 has been used to denote values less than a whole unit.
Supporting document 2: Landscape change

Recent changes

**Trees and woodlands**
- There has been new planting of small scattered woodland blocks on higher land and steeper slopes in the west and north.
- There has been an increase in the area of woodlands managed under Woodland Grant Scheme agreements.

**Boundary features**
- The total length of agreements between 1999 and 2003 was equivalent to about 4 per cent of field boundaries within the NCA.
- Recent data from March 2011 shows a dramatic increase of 1,862 km of boundary features under Environmental Stewardship options, mainly through the Entry Level Scheme, resulting in tightly cropped hedges filling out and becoming taller and wider.

**Agriculture**
- Overall, during the period 2000 to 2009 there has been little change. However, holdings producing oilseed have more than doubled by 110 per cent, there has been a decrease in pig, sheep and cattle numbers by 19 per cent, 44 per cent and 18 per cent respectively and while the number of principal farmers remain unchanged, the employment of full time workers has fallen by 36 per cent.

**Settlement and development**
- There is a cluster of development west of Wetwang along the axis of the A166, expansion along the A63 corridor and around existing larger settlements, and an increase in applications for wind farm sites.
- Semi-natural habitats are limited in extent within this NCA. Less than 1 per cent is nationally designated for nature conservation. 26.6 per cent of the SSSI are in favourable condition and 66.5 per cent are in unfavourable recovering condition.
- Countryside Stewardship agreements in 2003 for management of calcareous grassland covered 1 per cent of the NCA.
- More recently, through the Higher Level Scheme, 722 ha of chalk grassland and 950 ha of all grassland are in conservation management.
Semi-natural habitat

- In 1918 approximately 3 per cent of the NCA was historic parkland but by 1995 it is estimated that 37 per cent had been lost. About 28 per cent of the remaining parkland is covered by a Historic Parkland Grant, and 24 per cent is included in environmental stewardship schemes. About 68 per cent of historic farm buildings remain unconverted and 92 per cent are structurally intact.

Rivers

- Rivers and streams are few on the permeable chalk, being limited to a number of short streams draining steep valleys along the escarpment, and the Gypsey Race, which runs through the Great Wolds Valley. However, the chemical status and trends for groundwater is poor due to long term nitrate pollution of the aquifer including the River Hull headwaters SSSI in the adjoining NCA.

Minerals

- The Yorkshire and Humber Aggregate Mineral Resources map shows a number of active chalk quarries that may potentially result in extension of quarrying in the future.

Drivers of change

Climate change

- Climate trends suggest increased rainfall, periods of drought, and more frequent storm events.

- Increased summer droughts could result in demands on groundwater resources associated with the underlying chalk aquifer. Low groundwater levels inside the NCA are likely to result in lower river levels outside this NCA as they are spring-fed.

- Increased demands on agricultural land for food production in relation to food security.

- Potential introduction of new crops and longer cropping seasons potentially leading to double cropping.

- Possible impacts on semi-natural habitats, in particular on chalk grasslands, and on species through drought conditions including dominance of drought-resistant species.
Other key drivers

The following key drivers of change are anticipated:

- The need for food security will result in continued agricultural production along with changing farming practices. Agri-environment schemes provide opportunities to work with land managers to incorporate farmland habitats, develop networks of linked habitats and enhance the rural character of the landscape.

- Continued demand for housing provision and associated growth, particularly along the A63 and railway transport route and west of Hull, but provide opportunities to respect local vernacular of traditional buildings.

- A policy of ‘No Active Intervention’ has been recommended in the draft Shoreline Management Plan for Flamborough Head, to allow the natural retreat of the cliff line enabling internationally designated sites to evolve under natural processes. It is recognised that there will be a need to plan for setting back properties after 2025.

- Promotion of careful development will be required concerning mineral/aggregates extraction in order to protect the underlying chalk bedrock, but opportunities for biodiversity enhancement through restoration schemes from minerals planning should also be sought.

- There is increasing demand for wind farm sites.

- The Marine and Coastal Access Act 2009 provides opportunities to protect the marine environment and ensure access to all parts of the coast. The coastal access trail will be created by working in close partnership with landowners in the long term.

- The chemical and quantitative trends for groundwater are poor suggesting that the chalk aquifer suffers from pollution and over-abstraction, potentially affecting water supply in the long term.

- The Humber River Basin management plan indicates that the water bodies within the NCA are generally poor and moderate, whilst ecological status of estuarine and coastal waters is good to moderate and chemical status of coastal waters is good.
The following analysis shows the projected impact of Statement of Environmental Opportunity on ecosystem service provision:

<table>
<thead>
<tr>
<th>Statement of Environmental Opportunity</th>
<th>Ecosystem Service</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEO 1</strong>: Enhance, extend and manage the unique assemblage of chalk-based habitats (lowland chalk grasslands, streams), broadleaved woodland and maritime cliffs while protecting the provision and quality of water.</td>
<td>Food provision</td>
</tr>
<tr>
<td><strong>SEO 2</strong>: Manage the coastal landscape of Flamborough Head with its diversity of cliffs, geology, geomorphology and habitats (including important seabird colonies), and enhance people’s enjoyment of it through increased opportunities for recreation and education.</td>
<td>**</td>
</tr>
</tbody>
</table>

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

**SEO 3:** Improve opportunities to enhance people's enjoyment of the area whilst protecting high levels of tranquillity by conserving extensive views and intimate, steep-sided valleys which contribute to sense of place, and by protecting and promoting the extensive historic evidence of past human settlement, landscape change and designed landscapes.

**SEO 4:** Maintain a sustainable but productive arable landscape, whilst expanding and connecting semi-natural habitats to benefit biodiversity, and soil and water quality by promoting good agricultural practice; extending grasslands along field margins and slopes, implementing extensive grazing regimes and ensuring compliance with regulations on nitrate vulnerable zones to manage fertiliser inputs.

<table>
<thead>
<tr>
<th>Ecosystem Service</th>
<th>Food provision</th>
<th>Timber provision</th>
<th>Biomass provision</th>
<th>Water availability</th>
<th>Genetic diversity</th>
<th>Climate regulation</th>
<th>Regulating soil erosion</th>
<th>Regulating soil quality</th>
<th>Regulating water quality</th>
<th>Regulating water flow</th>
<th>Pollination</th>
<th>Pest regulation</th>
<th>Regulating coastal erosion</th>
<th>Sense of place/inspiration</th>
<th>Sense of history</th>
<th>Tranquility</th>
<th>Recreation</th>
<th>Biodiversity</th>
<th>Geodiversity</th>
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<td><strong>SEO 4</strong></td>
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Dark plum = National Importance;  Mid plum = Regional Importance;  Light plum = Local Importance.

Key facts and data

Analysis

Description

Summary

Opportunities

Landscape change

Supporting documents

National Character Area profile:
### Landscape attributes

<table>
<thead>
<tr>
<th>Landscape attribute</th>
<th>Justification for selection</th>
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</table>
| A large-scale, expansive rolling chalk landscape, with a plateau extending eastwards towards the North Sea and the high chalk cliffs of Bempton and Flamborough Head, with deeply incised valleys. | - Expansive, open views with big skies from the escarpment and plateau provide a sense of openness, contrasted against the more enclosed, sheltered valleys which divide them and instil a sense of intimacy.  
- The absence of people in this lightly settled landscape provides low intrusion and a high level of tranquillity.  
- The development of recreation opportunities for different users through the main walking and cycling routes; the Yorkshire Wolds Way National Trail, a long distance route running from Hessle near Hull to Filey Brigg, the Transpennine Trail passing through the southern tip, the Way of the Roses cycle route, running 'coast to coast' from Morecambe Bay to Bridlington Bay and a circular route running from Beverley to Market Weighton known as the Yorkshire Wolds Cycle Route. Additionally, bridleways and a number of easy access and circular walks.  
- The dramatic, hard, chalk coastline of Flamborough Head and Bempton Cliffs are designated Heritage Coast due to their natural, cultural and geological interest. The good coastal paths provide access and recreation for local communities and visitors. Expansion of the coastal path northwards to join the Cleveland Way - in the Vale of Pickering NCA- is recognised as a potential opportunity.  
- Flamborough Head is designated a European Marine Site for breeding coastal birds, clay reef and cave interest, a Special Area of Conservation (SAC) for chalk reef and sea caves and a Special Protection Area (SPA) for breeding sea birds. |
| Long history of human occupation, settlement and land use throughout the Wolds from the early Neolithic to today in the form of buried archaeology, upstanding earthworks, buildings and designed landscapes. | - Remains of burial mounds indicate Neolithic settlers, prehistoric earthworks with bronze and iron age sites such those in the Great Wold Valley and around Rudslon.  
- Recurrent periods of settlement in Roman, Saxon, Danish and Norman times.  
- Remnants of medieval settlements on the open hills such as Wharram Percy and Swaythorpe Croom.  
- Extensive evidence of past human impact on the Wolds landscape, well illustrated in crop and soil mark sites seen from aerial photography and geophysical survey due to the Wolds geology and modern land use. |
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| Lightly settled landscape with settlement patterns established mainly around the fringes and along spring lines to the west and east. | - Long-established villages nestled in valleys with village ponds being a common characteristic.  
- Villages with brick and pan tiled-roof buildings are notable features but limestone sometimes used in the west. Near Flamborough Head, older buildings are built with chalk.  
- Sparsely populated with the largest towns of Market Weighton, Bridlington, Pocklington, Driffield and Norton on Derwent situated outside the NCA but close to its boundaries.  
- A cluster of development occurs west of Wetwang, along the axis of the A166 with expansion along the A63 corridor. |
| Underlying Upper Cretaceous Chalk of the Wolds comprises the most northerly formation in Britain. Earlier Jurassic rocks bind the base along northern and western escarpments. | - Connection between underlying chalk of the Wolds hills and land use. Fertile, chalky soils have resulted in the dominance of Arable farming (65 per cent of farmed area).  
- Jurassic and Cretaceous sedimentary strata exposed by quarrying and of which 5 Sites of Special Scientific Interest have been notified wholly or partly for their earth science importance.  
- Pressure to extend chalk quarries.  
- Underlying chalk aquifer is a valuable groundwater source but vulnerable to summer water scarcity. The western edge (Yorkshire Derwent) and eastern part of the NCA (East Riding of Yorkshire/North Lincolnshire) are identified as catchment sensitive farming priorities. |
| An open landscape, sparsely-wooded except for scattered shelterbelts associated with farmsteads and small number of ancient woodlands. | - High on the Wolds plateau, limited woodland cover and lack of vertical structures, contributes to the sense of openness and escapism, whilst shelterbelts appear as features on the skyline close to farmsteads.  
- A small number of woodlands (0.06 per cent of the NCA) have conservation value lying north of the Wolds supporting ancient woodland flora such as bluebell and wood sorrel, whilst in the south, calcareous ash woodlands such as Millington Wood, contain the nationally scarce baneberry and where redstart is a localised breeding bird. |
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<th>Landscape attribute</th>
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| Large, planned arable fields dating from the 18th century characterise much of the landscape. | - Large field sizes, with sparse hedgerows are the result of intensive cultivation due to the importance of arable farming, mainly cereal production and oil seeds.  
- Prominent, historic features of land use are the straight drove ways that cross the fields and enclosure roads with wide verges.  
- Arable farmland is important for a number of declining species in the NCA mainly corn bunting, grey partridge and hare. |
| Valuable habitats of chalk grassland, calcareous streams, spring-fed flushes, chalk rivers and calcareous ash woodlands. | - Unimproved or semi-improved calcareous grassland on steep-sided dry valleys are a key characteristic occurring throughout the NCA but with concentrations above Pocklington (Millington) and around Thixendale and Forden in the north eastern area.  
- Calcareous grasslands are an important BAP habitat covering only 1.3 per cent of the NCA and of which there are 20 Sites of Special Scientific Interest (SSSI). They support a mosaic of plant communities such as tor-grass and characteristic grassland herbs such as dropwort and lady's bedstraw. Species supported are butterflies and moths mainly the marbled white, brown argus and cistus forester.  
- Some remaining chalk grasslands have deteriorated due to adverse grazing regimes, reduction in stock numbers, piecemeal improvements, and encroachment of coarse grasses.  
- Disused chalk quarries provide opportunities for habitat creation, restoration or maintenance.  
- Spring-fed flushes fed by calcareous groundwater occur in several valleys and give rise to calcareous marsh plant communities, along the scarp slopes and coastline such as Hoddy Cows Spring SSSI near Buckton where water rises through boulder clay from the underlying chalk aquifer, consisting of species-rich fen and mosses.  
- Coastal spring flushes contain important plant communities and are of significant botanical interest on the Flamborough Headland.  
- Calcareous streams, the most northerly in Britain, are found along the western escarpment, but the River Hull streams in the east, extend into the River Hull SSSI in the adjoining Holderness NCA and support distinctive invertebrates.  
- Chalk rivers provide important hydrology within the otherwise dry valleys and support white-clawed crayfish.  
- South of the Wolds a small number of calcareous, ash woodlands support ancient woodland flora. |
Landscape opportunities

- Protect expansive views of rolling hills and dramatic, heritage coastline for remoteness, tranquillity, geology and recreation.
- Conserve archaeological evidence and ground features such as burial mounds, earthworks, settlement sites, barrows and crop marks.
- Conserve important nesting sites for cliff-breeding birds notably the black-legged kittiwake at Flamborough and Bempton.
- Protect access to cliffs for the benefit of sea birds and enhancement of recreation opportunities.
- Protect unity of building materials related to local geology.
- Conserve existing calcareous ash woodlands through sound conservation management.
- Protect archaeological ground features and historical features, including drove ways and enclosure roads with wide verges.
- Protect, manage, enhance and restore species-rich swards of unimproved/semi-improved chalk grasslands by suitable grazing and management of scrub to retain diversity of flora and fauna.
- Manage disused, chalk quarries for their biodiversity value including seeking opportunities for habitat creation and restoration through minerals planning.
- Manage calcareous ash woodlands by maintaining diverse woodland structure including coppicing and create new riparian woodland along watercourses and wider catchment planting on the lower eastern slopes of the Wolds.
- Manage rivers, streams and flushes to maintain hydrological processes and enhance the biodiversity of important plant and invertebrate communities and the white-clawed crayfish found in chalk rivers.
- Maintain quantity and quality of groundwater avoiding contamination by fertilisers and feeding of livestock by promoting good agricultural practices and through the environmental stewardship scheme.
- Avoid impacting on sense of remoteness and obstruction of clear views.
- Work with Local Access Forums to manage and maintain the existing public rights of way network.
- Interpret the surviving historic evidence from all periods and its relationship with the landscape.
- Manage and enhance the conservation of the finite archaeological and historical resource through supporting land managers and local communities and identifying education, access and research opportunities.
- Encourage land management interventions to provide food and shelter for farmland birds such as corn bunting, grey partridge, yellow wagtail and turtle dove.
- Plan new building to be sympathetic to local styles and materials.
- Ensure adequate, clean groundwater supply of chalk aquifer and hydrology of NCA.
- Support developments that are sensitive to protecting the expansive views of the Wolds.
- Create better access and recreation opportunities by providing more links from villages to the Yorkshire Wolds Way and the Transpennine Trail via permissive paths, bridleways and cycle routes.
- Work in partnership to explore opportunities to extend coastal access linking to Filey, which joins the Cleveland Way in the Vale of Pickering 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.

<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
<th>State</th>
<th>Main beneficiary</th>
<th>Analysis</th>
<th>Opportunities</th>
<th>Principle services offered by opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food provision</td>
<td>Livestock systems Cereal and oilseed Production</td>
<td>High percentage of Grade 2 and 3 agricultural land - dominated by arable production and livestock production (mainly pigs).</td>
<td>National</td>
<td>Food provision is a significant service in the Wolds but intensive cultivation of land may also lead to loss of water quality due to nitrate inputs. Extensive arable land and limited semi-natural habitats reduces the range of nectar sources for pollinating insects. Soil regulation may be reduced if more land is cultivated and if it replaces semi-natural habitats such as species-rich grassland.</td>
<td>Encourage sustainable farming practices including compliance with nitrate vulnerable zone (NVZ) regulations.</td>
<td>Food provision Biodiversity Climate regulation Regulating soil quality Regulating soil erosion Regulating water quality Water availability</td>
</tr>
</tbody>
</table>
### 27. Yorkshire Wolds

#### Summary

<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
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<th>Analysis</th>
<th>Opportunities</th>
<th>Principle services offered by opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber provision</td>
<td>Existing woodland</td>
<td>Only 4.5 per cent woodland cover. There is limited commercial timber produced apart from that from the larger estates such as Sledmere.</td>
<td>Local</td>
<td>Low woodland cover and limited opportunity for further woodland creation because of the potential impact on productive agricultural land, open landscape and expansive views.</td>
<td>Opportunities for commercial timber production are limited because land is more suited to agriculture. Small woodland blocks could be created on higher land and steeper slopes in the west and conifer plantations to the north. Much of the broadleaved woodland is of high nature conservation value and should be protected and maintained.</td>
<td>Climate regulation</td>
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- **Climate regulation**
- **Regulating soil erosion**
- **Regulating water quality**
<table>
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<th>Principle services offered by opportunities</th>
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</thead>
<tbody>
<tr>
<td><strong>Biomass provision</strong></td>
<td>Existing woodland</td>
<td>Limited woodland cover limits availability of existing woody biomass.</td>
<td>Local</td>
<td>Improved woodland management could provide a local source of fire wood and woodchip. There are limited locations for new biomass plantings. The area offers medium potential yields for Short Rotation Coppice (SRC) and miscanthus. For information on the potential landscape impacts of biomass plantings within the NCA, refer to <a href="http://archive.defra.gov.uk/foodfarm/growing/crops/industrial/energy/opportunities/index.htm">http://archive.defra.gov.uk/foodfarm/growing/crops/industrial/energy/opportunities/index.htm</a></td>
<td>Ensure existing woodlands are managed to produce surplus timber that could be used to provide local sources of biomass.</td>
<td><strong>Biomass provision</strong></td>
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<td></td>
<td><strong>Biodiversity</strong></td>
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<td>Service</td>
<td>Assets/attributes: main contributors to service</td>
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<tr>
<td>Water availability</td>
<td>Chalk aquifer&lt;br&gt;Semi natural chalk grasslands</td>
<td>Water is rarely found on the land surface but the chalk substrate forms a major aquifer supplying water to the Yorkshire and Humber region and some limited irrigation for agriculture. There are no major rivers running through the NCA but streams and calcareous springs flow east feeding into the upper reaches of the River Hull Headwaters SSSI in the adjoining Holderness NCA</td>
<td>Regional</td>
<td>There is little surplus water available, with the eastern coastal part of the aquifer considered to be over-licensed potentially creating a risk to the base flows in some rivers and streams in the west of the Character Area(^1). Abstractions water used for drinking water supplied to the region is likely to affect water availability in drought conditions. Protecting streams and calcareous springs in this otherwise dry NCA, is essential for biodiversity and flows of the River Hull Headwaters in the adjoining Holderness NCA.</td>
<td>Maintaining and improving the chalk aquifer for public water supply, its long term resilience and water storage by working with the local farming community to adopt sustainable farming practices such as; compliance with NVZ regulations, creating or restoring grasslands on the valley slopes to improve filtration into the ground and reduce nutrient runoff and creation of grass buffer strips close to springs and chalk streams.</td>
<td>Water availability&lt;br&gt;Regulating water quality&lt;br&gt;Food provision&lt;br&gt;Biodiversity&lt;br&gt;Regulating soil quality</td>
</tr>
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</table>

\(^1\) *Natural Area Profile*
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<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
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<tr>
<td>Genetic diversity - not commercially important in this NCA</td>
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<tr>
<td>Climate regulation</td>
<td>Woodland</td>
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<td>Local</td>
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<td>Semi-natural habitats</td>
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<td>The majority of the NCA has a low carbon soil content (0-5%), rising only to 5-10% in a few patches in the west. These relatively thin chalk soils have low levels of organic matter and high use of fertilisers, necessary for arable production.</td>
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<td>Soil cultivation involving high fertiliser use for arable production as well as livestock grazing (cattle), are likely to be a significant source of the greenhouse gas, nitrous oxide. The low woodland cover (4.5%) contributes little to carbon storage.</td>
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<td></td>
<td>Encourage sustainable cultivation practices such as green cover crops to reduce nitrate leaching, and extensive grazing regimes (cattle) to reduce methane production.</td>
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<td>Encourage reduced fertiliser inputs on cultivated soils by ensuring Government guidelines (NVZ regulations) are followed by farmers and land managers.</td>
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<td>Encourage management of hedgerows and hedges, filling in gaps and allowing them to fill out, on the high Wolds</td>
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<td></td>
<td>Encourage woodland creation within valleys or as shelterbelts around farmsteads where appropriate.</td>
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### 27. Yorkshire Wolds

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</thead>
<tbody>
<tr>
<td>Regulating soil erosion</td>
<td>Sustainable farming practices</td>
<td>The thin, chalky tills of the NCA are resilient to soil erosion.</td>
<td>Regional</td>
<td>The most vulnerable areas regarding soil erosion are on the steep valley slopes under arable production, particularly during frequent, high intensity downpours at a time when crops are establishing or being harvested.</td>
<td>Encourage efforts to increase green cover crops on cultivated or bare soil on steep slopes. Create grasslands on slopes, and grassland buffer strips along field margins and alongside watercourses, especially on the lower slopes on the east side of the Wolds. Encourage extensive grazing regimes on soils most vulnerable to compaction.</td>
<td>Regulating soil erosion and quality</td>
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<td>Semi-natural habitats</td>
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<td>Regulating water quality</td>
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<td>Water availability</td>
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<td>Sense of place/ inspiration</td>
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<tr>
<td>Regulating soil quality</td>
<td>Soils</td>
<td>45% of the NCA has shallow lime-rich soils, whilst 29% are freely</td>
<td>Regional</td>
<td>Organic matter may be lost through frequent tillage associated with intensive arable farming, however, cultivation of some arable crops such as potatoes can help retain organic matter.</td>
<td>Encourage sustainable farming practices; test soils to assess nutrient needs and encourage expansion of grasslands (green cover crops) to build up organic matter.</td>
<td>Regulating soil erosion and quality</td>
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<tr>
<td></td>
<td>Sustainable farming practices</td>
<td>draining lime-rich loamy soils. These soil types are typically</td>
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<td>Regulating water quality</td>
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<td>shallow and free-draining. Although they are vulnerable to</td>
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<td>Water availability</td>
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<td>drought, they also have a degree of natural resilience due to their</td>
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<td>Biodiversity</td>
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<td>calcareous nature. These soils are valuable for aquifer recharge.</td>
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<td>Semi-natural chalk grasslands</td>
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<td>Geological processes</td>
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</tbody>
</table>

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**Supporting documents**

**National Character Area profile:**

**Summary**

**Description**

**Opportunities**

**Key facts and data**

**Landscape change**

**Analysis**
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<tbody>
<tr>
<td>Regulating water quality</td>
<td>Chalk aquifer</td>
<td>The chemical quality of groundwaters (including the chalk aquifer) is classified as poor throughout the NCA. Where the water table is sufficiently high to permit river flows, surface water is of moderate ecological quality. 97 per cent of the area is a Nitrate Vulnerable Zone. There are indications that water quality downstream is being affected by activities in this NCA.</td>
<td>Regional</td>
<td>Diffuse agricultural pollution through nitrates is likely to affect water quality of the groundwaters and the fragile northerly chalk streams of the NCA, as well as waterways in adjoining NCAs into which the streams feed. Areas covered by semi-natural habitat in good ecological condition are generally less susceptible to high rates of run-off.</td>
<td>Reduce diffuse pollution by encouraging sustainable farming practices, avoiding overuse of fertilisers and pesticides (adhering to NVZ guidelines), and encouraging the creation of grasslands on valley slopes. Seek opportunities for wider catchment woodland planting on the lower eastern slopes to help promote rainfall infiltration into the soil reduce water pollution and sediment run-off, creating grassland buffer strips or riparian woodland along watercourses.</td>
<td>Regulating water quality</td>
</tr>
<tr>
<td>Regulating water flow</td>
<td>Chalk aquifer</td>
<td>The permeable nature of the underlying chalk ensures that there are no large areas at risk from river flooding.</td>
<td>Local</td>
<td>Flooding is not an issue in the NCA.</td>
<td></td>
<td>Regulating soil erosion and quality</td>
</tr>
</tbody>
</table>

27. Yorkshire Wolds
### 27. Yorkshire Wolds

#### National Character Area profile:

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<tr>
<td>Regulating coastal erosion</td>
<td>Chalk cliffs</td>
<td>The narrow stretch of coast around Flamborough Head stands well above sea level and is not at risk of coastal flooding, although some erosion is occurring at a slow rate.</td>
<td>Local</td>
<td>No Active Intervention has been recommended in the draft Shoreline Management Plan for Flamborough Head. There is an intention to allow the natural retreat of the cliff line, enabling internationally designated sites to evolve under natural processes.</td>
<td>Allow natural coastal processes to continue</td>
<td></td>
</tr>
<tr>
<td>Pollination</td>
<td>Semi natural chalk grasslands</td>
<td>Dominance of arable cultivation limits habitat for pollinating insects. Current semi-natural, non-wooded habitats cover only 2 per cent of the NCA.</td>
<td>Local</td>
<td>Pollination of oilseed crops is essential for sustainable agricultural production, but monoculture of crops for arable farming and lack of semi-natural habitats provides less variety of plant species for pollinating insects. Semi-natural woodlands can also be a source of nectar, particularly early in the season.</td>
<td>Encourage sustainable farming practices; increase species-rich grasslands and plant nectar-rich seed mixes to create an ecological network of habitats. Extend the network of woodlands where appropriate.</td>
<td>Food production Pollination Biodiversity</td>
</tr>
</tbody>
</table>
## 27. Yorkshire Wolds

### Summary

| Service                        | Assets/attributes: main contributors to service                                                                                       | State                                                                                                                                           | Main beneficiary | Analysis                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Opportunities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Principle services offered by opportunities                                                                 |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sense of place/inspiration    | Long views of rolling hills and big skies                                                                                           | Open, undulating, simple, uniform, a much valued landscape that provides inspiration for creativity such as is seen in the work of landscape artist, David Hockney.                                             | Regional         | Continuity of long views and rolling hills provides a sense of openness and a landscape that has remained largely unchanged for many years. This is likely to have a strong effect on local identity. The lack of manmade structures in this lightly settled landscape creates a sense of escapism from the modern world.                                                                                     | Ensure that development respects local settlement patterns, building materials, expansive viewpoints, enclosed, steep-sided valleys, wildlife, geology and historic evidence. Encourage visitors to the NCA. Offer good quality interpretation at key sites and encourage opportunities for education of the natural environment (landscape, biodiversity, wildlife, geology and heritage) by working with schools and other educational institutions.                                                                                           | Sense of place/inspiration                                                                                           |
|                               | Contrasting with enclosed steep-sided valleys.                                                                                    | An area characterised by its gently rolling hills and un-commercial nature, which is contrasted against the neighbouring flat land towards Hull.                                                          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                               | Low tree cover                                                                                                                       | Dramatic steep chalk cliffs at the coast captured in the 400 feet high Flamborough Head and its high, open, long distant views.                                                                             |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                               | Sheep-grazed unimproved or semi-improved calcareous grassland in steep-sided dry valleys and hillsides of floristically-rich grasslands | Views of expansive skies over a large-scale landscape. The openness and perceived closeness to the sky makes people feel they have transcended their day-to-day lives.                                                          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                               | Sparse settlement patterns                                                                                                           | There is a wide range of historic features from prehistory through medieval times to historic parklands.                                                                                                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                               | Rugged coastline                                                                                                                      |                                                                                                                                                                                                              |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                               | Time depth of evident historic interest                                                                                             |                                                                                                                                                                                                              |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### Description

#### Sense of place/inspiration

- **Long views of rolling hills and big skies**
  - Contrasting with enclosed steep-sided valleys.
  - Low tree cover
  - Sheep-grazed unimproved or semi-improved calcareous grassland in steep-sided dry valleys and hillsides of floristically-rich grasslands
  - Sparse settlement patterns
  - Rugged coastline
  - Time depth of evident historic interest

The Yorkshire Wolds offer a profound sense of place and inspiration. The landscape is marked by open, undulating, simple, uniform views, providing a much-valued and inspirational backdrop for creativity. The region is characterized by its gently rolling hills and un-commercial nature, which are set against the neighboring flat land towards Hull. Dramatic steep chalk cliffs at the coast create a striking contrast, and expansive skies over the large-scale landscape evoke a sense of openness and perceived closeness to the sky. People often feel they have transcended their day-to-day lives.

The landscape has a rich history, providing a sense of intimacy and remoteness. The underlying chalk landscape reaches the North Sea, forming a rugged coastline at Embleton and Flamborough Head, where large colonies of breeding seabirds are iconic to the area, offering an interesting wildlife spectacle for local people and visitors. The landscape change and historical development have left a legacy of historic features, from prehistory through medieval times to historic parklands, enriching the region's cultural and natural heritage.

### Analysis

The Yorkshire Wolds have maintained a largely unchanged landscape for many years, providing a sense of continuity and a sense of openness that have remained largely unchanged for many years. The lack of man-made structures in this lightly settled landscape creates a sense of escapism from the modern world. The region is a treasure trove of historic features, ranging from prehistory through medieval times to historic parklands, offering a rich tapestry of cultural and natural heritage.

### Opportunities

- **Ensure that development respects local settlement patterns, building materials, expansive viewpoints, enclosed, steep-sided valleys, wildlife, geology and historic evidence.**
- **Encourage visitors to the NCA.**
- **Offer good quality interpretation at key sites and encourage opportunities for education of the natural environment (landscape, biodiversity, wildlife, geology and heritage) by working with schools and other educational institutions.**

### Supporting documents

- National Character
- Area profile:
  - Key facts and data
  - Landscape change
  - Analysis
## 27. Yorkshire Wolds

### National Character
Area profile:

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<tbody>
<tr>
<td>Sense of history</td>
<td>Prehistoric remains and numerous bronze and iron-age monuments, especially in Great Wold Valley. Deserted medieval settlements on the open hills; large estates and parklands (six registered parks and gardens). Strong unifying local vernacular linked to the underlying geology, including limestone, chalk and red brick.</td>
<td>Regional</td>
<td>This area has a rich and varied history resulting in a range of structures and features providing opportunities for tourism and education. There is also a need for its protection as some features may be damaged by deep ploughing of land.</td>
<td>Protect historic features by encouraging best agricultural practices such as through reversion of arable to grassland where land management threatens the integrity of earthworks and below-ground archaeology, encouraging scrub removal on earthworks (Neolithic, bronze and iron age monuments). Develop a package of interpretation through partnership on key sites for visitors, school children and students. Develop a package of visitor/tourism opportunities. Ensure developers respect the local vernacular regarding new buildings. Maintain estates and parklands and protect ancient monuments at risk identifying opportunities through Environmental Stewardship.</td>
<td>Sense of history Sense of place/inspiration Recreation Tranquillity</td>
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</tr>
<tr>
<td>Tranquility</td>
<td>Expansive, open views and enclosed steep-sided valleys Sparse settlement patterns &amp; low population Long, distant sea views from coastline</td>
<td>An area with a strong sense of tranquillity. In 2007 78 per cent of the NCA was classified as undisturbed (CPRE Intrusion Map).</td>
<td>Regional</td>
<td>A very large proportion of the NCA contributes to the high sense of tranquillity due to elevated views, low proportion of manmade structures, sparse settlement patterns and lack of major towns and cities.</td>
<td>Encourage sensitive development respecting open and expansive viewpoints and strong rural character of the area.</td>
</tr>
</tbody>
</table>
# 27. Yorkshire Wolds

## Summary

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<td>Recreation</td>
<td>Network of Footpaths (0.53 per km²) Yorkshire Wolds Way Transpennine Trail Heritage Coast Large estates and Parklands Historic sites National Cycle Routes</td>
<td>2.5% of the area is open access land, 682 km of rights of way at a density of 0.5 km per km². Main routes include a small section of the Transpennine Trail and the Yorkshire Wolds Way National Trail, the latter covering 117 km. However, there are low numbers of circular routes linking to them. There are two national cycle routes; The Way of the Roses, running coast to coast from Morecambe Bay to Bridlington Bay and a circular route known as the Yorkshire Wolds Cycle Route. The coast at Flamborough offers recreation opportunities for visitors with its heritage coastline, caravan parks and RSPB Bempton Nature Reserve, as do the Country Estate and Parklands at Sledmere and Burton Agnes.</td>
<td>Regional</td>
<td>Although the NCA has a low density of public rights of way, it offers varied recreation and access opportunities inland, along the coast and to sites of historical interest. However, there is scope for further joining up of main routes to the permissive paths.</td>
<td>There are opportunities to improve access by ensuring that paths are well maintained and signposted, and that some surfaced paths are provided for use by all levels of ability and interest in key locations. Improve and extend access to recreation for a wide range of users by developing shorter circular routes linked to historic sites, cycle routes, bridleways, National Trails, development of easy access walks and educational packs. Improve interpretation and development of green tourism opportunities. Expansion of the coastal path in the long term to link to the Cleveland Way through the Coastal Access (from Filey to Speeton), which includes Flamborough Head.</td>
<td>Recreation</td>
</tr>
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</table>
## 27. Yorkshire Wolds

### National Character Area profile:

- **Summary**
- **Description**
- **Opportunities**
- **Key facts and data**
- **Landscape change**
- **Analysis**

### Supporting documents

- National Character Area
- Area profile:
  - Key facts and data
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<tr>
<td><strong>Biodiversity</strong></td>
<td>International and national designations&lt;br&gt;Semi-natural/BAP habitats (lowland calcareous grassland, broadleaved woodland, maritime cliffs and slope, chalk rivers and streams)</td>
<td>International and National Nature conservation designations currently cover 0.08% and 0.92% of the NCA around the coast - Flamborough Head (SAC &amp; SPA) and Bempton Cliffs (part of Flamborough Head SPA). Flamborough is also designated heritage coast. There are 38 SSSI with the majority being in unfavourable recovering condition.</td>
<td>Local</td>
<td>Improving the biological condition of the designated resource is likely to involve sustainable land management activities, principally through maintenance and increase in coverage of semi-natural habitats (creating buffer strips, extending grasslands along field margins and slopes, maintenance and improvement of natural hydrological systems, employing sensitive grazing regimes and creating a network of woodlands in appropriate places) These will also help to increase/improve regulating services such as water quality and soil erosion, whilst contributing to sense of place.</td>
<td>Protect SSSI and BAP habitats; species-rich grasslands, broadleaved woodlands, maritime cliffs and slopes.&lt;br&gt;Buffer the designated resource by planting nectar-rich seed mixes and grassland strips to create an ecological network of habitats around and between farmland. This will also benefit butterflies and moths species such as marbled white, brown argus and cistus forestier.&lt;br&gt;Restore and maintain cliff top habitats by creating buffer strips and reversion to grassland.&lt;br&gt;Encourage management practices to benefit farmland birds such as grey partridge, lapwing, turtle dove, yellow wagtail, tree sparrow, corn bunting, quail, barn owl and yellowhammer by providing bird seed crops (winter food source) and creating flower strips and grass margins (summer nesting habitats).&lt;br&gt;Increase chalk grasslands on sloping arable land where it is unsuitable for arable production.&lt;br&gt;Improve condition of chalk streams and associated riparian habitats by creating buffer strips alongside streams.</td>
<td>Biodiversity&lt;br&gt;Recreation&lt;br&gt;Regulating soil erosion&lt;br&gt;Regulating soil quality&lt;br&gt;Regulating water quality&lt;br&gt;Water availability&lt;br&gt;Sense of place/inspiration&lt;br&gt;Tranquillity</td>
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<tr>
<td>Geodiversity</td>
<td>Designated geological sites: Exposures in old quarries Flamborough head cliffs</td>
<td>There are currently 4 nationally designated geological sites and 4 of geological and biodiversity interest within the NCA. These consist mainly of man-made exposures (disused chalk quarries) and sea caves.</td>
<td>Local</td>
<td>Designated sites provide important opportunities for allowing interpretation, understanding and research into the geodiversity of the NCA. Exposure of these features contributes towards the sense of place, history and biodiversity.</td>
<td>Need to protect designated areas and interpret them to a wide audience whilst developing visitor opportunities and access where appropriate.</td>
<td>Geodiversity Biodiversity Sense of history Sense of place/inspiration Recreation</td>
</tr>
</tbody>
</table>
Natural England is here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England’s traditional landscapes are safeguarded for future generations.

Catalogue Code: NE348

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www.naturalengland.org.uk

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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

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Summary

The Vale of York is an area of relatively flat, low-lying land surrounded by higher land to the north, east and west. High-quality soils across most of the National Character Area (NCA) mean that arable cultivation is the predominant land use, although some pig and dairy farming takes place in the western parts of the NCA. A key feature of the NCA is the rivers that drain surrounding higher land and run southwards through the Vale on towards the Humber basin. Natural flood plain habitats and associated species are still found within the Lower Derwent Valley (designated as a Special Protection Area, Special Area of Conservation and Ramsar site) although, like other flood plains, this area is threatened due to water quality issues.

The City of York, a settlement that has been an important focus since Roman times, sits at the centre of this NCA. The prominent York Minster can be seen from lower-lying surrounding countryside and, together with the city walls, provides the setting for the historic city.

Food and water provision and the regulation of water flow and water quality are key ecosystem services provided by this NCA. Flooding affects a number of communities within the NCA, as they are within the lower stretches of the river flood plains. More than 7,000 properties are at risk of flooding in York, Bishopthorpe, Haxby and Strensall from the River Ouse catchment.

There are opportunities to restore wetland habitat within river corridors to alleviate fast water flows (for example working with land managers on the River Foss to slow rates of floods that are generated in York) and aid climate adaptation mitigation. Restoration of river systems will also maintain and improve natural soil fertility for productive agriculture, improve the ecological networks and strengthen the ability of biodiversity to adapt to current – and future – pressures. A key challenge will be to establish sustainable land management practices that safeguard and strengthen the fertile soils needed for arable cultivation while also providing sustainable income for land managers.

*Draft Ouse Catchment Management Plan, Summary Report, Environment Agency (January 2010)*
Statements of Environmental Opportunities:

**SEO1:** Identify opportunities within the existing agricultural systems to enhance landscape character and create a functioning ecological network to safeguard future food provision, retain soil quality and reduce soil erosion and deliver benefits for biodiversity, carbon storage and climate regulation.

**SEO 2:** Manage and enhance the network of rivers and important wetland habitats within the Vale, increasing the landscape’s ability to naturally and sustainably manage flood and drought risk and provide other ecosystem services while recognising the needs of individual species and habitats and increasing the resilience of wildlife to climate change.

**SEO 3:** Increase the network of species-rich meadows, pastures, fields and hedgerows, ensuring that they and the wider farmed environment are managed to reduce rates of diffuse pollution and improve water quality. Extend and enhance heathland sites on areas of sandy soil for the benefit of biodiversity, as well as enhancing the sense of place.

**SEO 4:** Protect the historic and cultural features of the Vale, in particular the traditional settlement patterns of remaining villages and the evidence of previous settlements that provide a strong sense of place.
Description

Physical and functional links to other National Character Areas

The Vale of York forms a transitional landscape between the more varied topography and the mixed farming of the Vale of Mowbray to the north and the flat, open land of the Humberhead Levels to the south.

The adjoining elevated areas feature an extensive network of major rivers, with the Derwent rising in the North York Moors and Cleveland Hills National Character Area (NCA) in the north; the Swale, Nidd and Ure in the Yorkshire Dales NCA; and the Wharfe in the Southern Pennines NCA to the west. These watercourses all ultimately flow into the Humber Estuary to the south-east. The Vale of York is an important convergence zone for the upland rivers; they converge into the River Ouse, which starts in the Vale of York. These rivers, and their associated flood plain habitats, provide important corridors for species movement between the Vale and surrounding NCAs. This could become increasingly important as habitats around the Humber are squeezed by the effects of climate change. The settlements in the Vale rely heavily on the water supplied by these rivers.

A network of transport routes radiates from the City of York: York railway station remains an important junction for passengers travelling to the north-east. The A19 runs north–south through the centre of the NCA, with other A roads linking York east–west with other NCAs.

Views of higher ground to the north and east in the Howardian Hills and Yorkshire Wolds, and to some extent the Southern Magnesian Limestone ridge to the west, frame the valley and provide a backdrop to the relatively open and flat landscape of the NCA.

Land use is predominantly agricultural, with large arable fields bounded by hedgerows of varying quality and some field boundary trees.
Key characteristics

- A largely open, flat and low-lying landscape between the higher land of the Southern Magnesian Limestone ridge to the west, the Howardian Hills to the north and the Yorkshire Wolds to the east.

- Dominantly Triassic solid geology, which is obscured by glacial till, sand, gravel and moraines, with obvious ridges formed by the York and Escrick moraines.

- Predominantly agricultural land use, with medium- to large-scale arable fields defined by hedgerows (which are often low and intermittent with sparse hedgerow trees) and fences. Large dispersed farmsteads and small villages on higher land are set within a quiet rural landscape.

- Extensive (mostly cropmark) evidence of bronze-age to Romano-British settlement, especially on the western fringe, for example enclosed and unenclosed farmsteads with hut circles and coaxial field systems.

- Wetland features dotted through the wider landscape of the NCA, providing stepping stones between wider areas of water-dependent and priority habitat, such as important remnants of ‘ings’ meadows on the river flood plains (traditionally managed by hay-making) and some unimproved and semi-improved meadows and pastures, in particular in the Derwent Ings.

- Some areas of heathland remaining on poorer sandy soils (for example Strensall, Stockton and Allerthorpe commons), along with small scattered broadleaved woodlands and larger conifer plantations.

- Parkland associated with country houses, with tree clumps, tree belts, avenues and other architectural features adding to the variety of the landscape, for example Rufforth Hall Park, Beningbrough Hall and Bilton Hall.

- The main urban centre, the City of York, with roads radiating from the city and York Minster forming a prominent landmark and focal point for the Vale.

- The settlement patterns of the NCA, which broadly follow that of linear villages, with buildings (built with traditional materials of mottled brick and pantile roofs) set back behind wide grass verges and village greens, and dispersed large farmsteads.
The Vale of York today

The Vale of York is a transitional vale landscape marking the change from the more varied topography and mixed farming of the Vale of Mowbray to the north to the flat, open land of the Humberhead Levels to the south. It is a broad area bounded by the ridge of Magnesian Limestone which rises to the west and by the Howardian Hills and the Yorkshire Wolds to the east. The low ridge of the Escrick Moraine, which trends to the north-east, marks the southern limit and the transition to the Humberhead Levels.

The soils are mainly formed from glacial till, sand and gravel, making them generally fertile. The majority of the land is in arable use, with extensive areas of wheat and root vegetables. Fields are medium to large in size and enclosure is by low, flailed, often intermittent hedges, with few hedgerow trees. This gives the landscape a generally large-scale, open, well-tended character, where production is the main emphasis of land management. Much of the Vale of York is a working agricultural landscape but the settlement also contributes to its character. The City of York itself has a dominant influence and the tower of the minster, built from stone brought from the Southern Magnesian Limestone ridge to the west, is visible for miles around. The city, enclosed by the historic city walls, is very popular with tourists, bringing visitors through the city gates to attractions that build on the historic importance of the area.

The flat farmland is dotted with solid brick farmsteads and large villages, such as Upper and Nether Poppleton and Haxby to the north and Bishopthorpe and Copmanthorpe to the east, which exhibit the typical linear vale form of mottled brick houses with pantile roofs facing each other on either side of a main street. They are in themselves important features of the landscape and provide a special focus of interest.

The many stream courses and drainage channels link with the main rivers that cross the Vale. The flood plains of the rivers Ouse, Derwent, Ure, Nidd and Foss create much of this flat landscape. The National Character Area (NCA) has a wide variety of waterbodies (in terms of size and velocity) within it, making water a key feature of the NCA. The flood plains of the main rivers form a characteristic sight in the area, generally flowing from north-west to south-east. The flood plain of the River Derwent in the Lower Derwent Valley is designated both as a Special Protection Area (SPA) and Special Area of Conservation (SAC) for its internationally important lowland hay meadow habitat and contains a greater area of high-quality examples of this habitat than any other UK site. Traditional
management has maintained the mosaic of habitats within the valley and it is this variation that helps to support important species such as Bewick’s swan, ruff and golden plover. In winter the valley supports an internationally important assemblage of wading birds, including European teal and Eurasian wigeon. In the wider landscape, wetland features such as small field ponds, old brick ponds, wet heathland, valley mires (for example Askham Bog), fens and swamps (for example in the Lower Derwent Valley), fen meadows (also in the Lower Derwent Valley) and drainage dykes interspersed through the agricultural areas with other patches of semi-natural habitats provide stepping stones between designated areas and patches of semi-natural habitat.

Variations in landscape character come from subtle changes in soils, topography and land cover. Low ridges of sand and gravel, deposited as moraines or eskers as the glaciers of the last ice age retreated, rise above the flat plain in places, creating a more pronounced ridge and valley landform. Where there are dry, sandy soils, especially around York to the north, east and south, there are remnants of historic heathland and ancient semi-natural woodlands. Because of the low fertility and acidity of the soils, many of these areas have been planted with coniferous woods, usually of Scots pine. Examples of these features include Strensall, Stockton and Allerthorpe commons. Plantations, woodlands and heaths give a different character to these parts of the Vale, with the woodland edges creating a greater feeling of enclosure and forming wooded horizons.

Parkland associated with country houses is also a feature of this NCA, and the tree clumps, tree belts, avenues and other architectural features all add to the variety of the landscape. Examples include Rufforth Hall Park, Beningbrough Hall and Bilton Hall.

Access within the wider NCA is limited, but the Way of the Roses cycle route, which passes east–west as it links Morecambe to Bridlington, and the Yorkshire Wolds Way, which enters the NCA in the south-eastern corner, are notable long-distance routes that pass through the area.

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5.7 per cent of the population of Great Britain, 19 per cent of the population of Great Britain, 2.4 per cent of the population of Great Britain
The Landscape through time

The solid geology of the Vale of York comprises Triassic sandstone and mudstone and Lower Jurassic mudstone and is completely cloaked by varied superficial deposits. The deposits include glacial till, which forms a marked bench in the east, and sand and gravel, as well as two moraines that curve eastwards across the NCA. The York Moraine forms a curving ridge that extends from York to Sand Hutton, while the Escrick Moraine is evident about 8 km to the south, formed at the point at which the ice met the large proglacial Humber Lake in the south of the NCA. Trapped between moraine ridges a series of (possibly contemporary) glacial lakes developed to the north of the Escrick Moraine as the ice sheet advanced and retreated. When the lakes drained, they left a sequence of lake clays, silts and sands over much of the NCA. Subsequent aeolian (desert) reworking of these sands has led to the accumulation of thick sequences of wind-blown sand along the eastern margins of the NCA.

The main rivers and streams also laid down river alluvium consisting of clay, silt and sand. These lacustrine and alluvial deposits provide good loamy soils that support human settlement and food production. The impact of the river systems has influenced the locations at which settlements have developed, with evidence of early settlements on higher outcrops and later settlements centred on river crossings. The cool climate and increased rainfall during the Bronze Age meant that lowland wetlands enlarged and spread across the south of the Vale, making it less habitable. Evidence of early human settlement in the Vale of York (mostly in the western and eastern fringes) comes from the discovery of stone tools and flint scatters representative of Mesolithic and Neolithic activity, and rapiers and axes from the middle Bronze Age.

The Romans had a large influence on the character of the Vale of York, defining some of the settlement and infrastructure pattern that can still be seen today, particularly the network of roads radiating from York. The building of a legionary fortress on the York Moraine at Eboracum (now York) was the beginning of permanent civilian settlement in the area. York has continued to be the central focus of the area since this time and developed from a frontier town that resisted local tribes to a strategically important staging post to the north. York Minster was founded in 627 on the site of the Roman fortress and has been destroyed and rebuilt a number of times since, with the remaining Gothic structure started in 1230 and finished and consecrated in 1472. The surrounding productive and wealth-generating landscape meant that the Bishop of York rose to be the second highest office in the Church of England and that York became a major ecclesiastical centre.
Historically there has been a predominance of cattle rearing and dairying to the west, and horse breeding to the east, with livestock from the hills in surrounding NCAs brought to the lush vale grasslands for fattening. The rich grasslands of the flood plains supported sheep grazing and increased York's importance in the wool industry. Stud farms increased around York in the 18th and 19th centuries, probably as a result of the formalisation of a racetrack in York and the move to its current location. The racecourse continues to attract a large number of visitors to the area.

In the 16th century the Vale began to feature extensive areas of parkland and designed landscapes, such as the deer parks at Sheriff Hutton and Beningbrough Hall. The dissolution of the monasteries and 'gifting' of land to nobles also saw the establishment of notable country houses and estates in the NCA. Until the 17th century the Royal Forest of Galtres contained some larger areas of woodland in the north of the Vale of York. The forest at this time extended further into North Yorkshire, although it had been declining since its peak in the 12th century.

During the period that the Vikings held the north of England in the late ninth and early tenth centuries they established Jorvik (York) as their capital of Northumbria. In 954 this Viking kingdom was absorbed into the rest of England, although there were various attempts throughout the early 11th century from Danish Vikings to retake the kingdom. In 1066 the Battle of Stamford Bridge was fought between King Harold and a Norwegian force bolstered by Northumbrian support, which weakened Harold's army ahead of the Battle of Hastings.

Mixed agriculture has dominated the area since medieval times. Following the Norman conquest, King William undertook a number of campaigns to break future threats to the crown from the north, known as the 'harrying of the north'. The destruction of towns, villages and agricultural assets and the reassignment of land to favourable nobles led to a strong trend of nucleated settlement in planned villages; manors and estates established within the wider landscape during the late 11th–13th centuries still exist today. Moated sites are a particular feature of this landscape, such as examples at Appleton Roebuck, Pocklington and Barmby Moor. Many survive today as earthworks, cropmarks and soilmarks, and the ditches associated with these sites are still waterlogged in places, providing essential information on past land use and activity. Some villages retain former ridge and furrow and hedges following lines of curved strips, and the area is characterised by a high proportion of planned enclosure by Parliamentary Act between the mid-18th century and 1815.

The development of the railway network brought increased trade through York and York Railway Station remains an important transport hub today.
Woodland within the Vale continued to become scattered and piecemeal until large areas of sandy soil were planted with conifer plantations in the late 19th century, aided by the enclosure of common land on sandy soils.

In earlier centuries wheat and rye were the main crops grown, and large areas of grassland remained. Root crops such as potatoes and carrots were introduced early in the 20th century and remain common today. Noticeable intensification of agriculture occurred during the Second World War and continued in the decades afterwards. Throughout the 20th century sugar beet was a common crop around the City of York, as farmers supplied the York sugar beet factory. Since its in 2007, sugar beet production has been replaced by a range of other crops, notably oil seed rape.

Ecosystem Services

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

Provisioning services (food, fibre and water supply)

- **Food supply:** The Vale of York is part of a large swathe of agricultural land starting in the Vale of Mowbray in the north and running down to the Humberhead Levels in the south. Glacial lake deposits have helped to produce high grade soils (54 per cent Grade 3 and 28 per cent Grade 2), and historic drainage has helped to make the area ideal for arable farming, with 82 per cent of the total area in cultivation. Most holdings are given over to cereals and root crops, such as potatoes and carrots, with smaller proportions of mixed cropping, lowland cattle, sheep, pigs and poultry, as well as some dairy.

- **Water availability:** The Vale of York provides a large amount of water for local communities and for those as far away as Sheffield, both from underground aquifers and from abstraction from the rivers running through the NCA. The western part of the NCA overlies a Permo-Triassic sandstone aquifer (the Sherwood Sandstone aquifer, which is a major source of drinking water for the region). Rainfall is low in the NCA, and due to existing high levels of demand on these aquifers they currently have no water available for additional abstraction (except for a small area in the south-eastern corner).
Regulating services (water purification, air quality maintenance and climate regulation)

- **Regulating climate change**: A low proportion of carbon is stored within the first soil horizon (0–5 per cent) across most of the NCA, although there are pockets of higher soil carbon content which coincide with the heaths at Allerthorpe and Strensall as well as some areas underlying the south-western part of York.

- **Regulating soil erosion**: Regulation of soil erosion is currently low, although almost half the soils in the NCA are not susceptible to erosion. The light, sandy soils across much of the Vale are prone to soil erosion, with wind erosion an increasing concern in this area. Intensive agricultural practices increase the risk of erosion, especially after heavy rains or in areas of poorly draining soil. The risks are also enhanced on the steeper slopes where bare or cultivated soil is exposed and where continuous cultivation of crops such as potatoes has reduced organic levels in the soil.

- **Regulating soil quality**: Soil quality in its current state and management enables highly productive agriculture to prevail across the NCA. The value of slowly permeable, seasonally wet, slightly acidic but base-rich loamy and clayey soils (which cover 37 per cent of the NCA) could decrease, as such soils are susceptible to compaction and can be easily damaged when wet.

- **Regulating water quality**: Groundwater quality in this NCA is good in the east but poor in the west. All the rivers that have been assessed are of good chemical quality, including the rivers Ure and Ouse in the west. The ecological quality of the rivers in the area is classed as good or moderate, although a small stretch of river in the south-western corner associated with tributaries of the River Wharfe is classed as poor, as is the River Foss. Much of the central and northern parts of the NCA fall within the Yorkshire Ouse, Nidd and Swale catchment sensitive farming priority catchment, while parts of the south-east fall within the Yorkshire Derwent catchment sensitive farming priority catchment. (The catchment sensitive farming project offers advice and training to farmers and land managers in priority catchment areas to enable them to take voluntary action to reduce their high diffuse water pollution from agriculture to protect waterbodies and the environment.)

- **Regulating water flow (flooding)**: The NCA includes a large number of rivers that drain surrounding areas; high levels of drainage within the natural flood plains have increased the pressure on the river system, leading to a long history of flooding. The amount and speed of water arriving in the NCA are dependent on the condition of surrounding upland areas where the river headlands are located; land within the NCA is heavily drained, so more water arriving more quickly from surrounding areas increases flood risk locally. There is potential for a more naturalised regulation of flood waters in this NCA, although the system currently runs at capacity, especially along the River Ouse. Many sections of...
river have been canalised, disengaging them from their flood plains. These rivers cannot naturally deposit silt within flood plains, and build-up in the channels can exacerbate flooding problems by limiting the storage capacity of the waterbody. Restoration of washlands has helped to alleviate some of the flooding pressures in the lower parts of the Vale, for example to the north of the City of York.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/Inspiration**: Sense of place and cultural heritage services are dominated by the arable landscape and the major rivers that dissect the flat, open landscape. Semi-natural features such as remnant heathlands, ponds, wetlands, grasslands, hedges, hedgerow trees, copses, shelterbelts, remnants of ancient semi-natural woodlands and commons are scattered through the area, as are historic features such as irregular fields, Romano-British settlements, parkland associated with country houses, distinctive linear villages, isolated farmsteads, masonry bridges and vernacular buildings of traditional materials of mottled brick and pantile roofs. Within the walls of the City of York the historic buildings and minster provide a strong sense of place.

- **Sense of history**: There is a great sense of history throughout the NCA and the landscape is littered with evidence of settlements from Roman times. History within the Vale has been dominated by the continuous mixed land use of lush river meadow pasture and productive, versatile soils. Villages within this landscape have a structure relating to post-Norman settlement and planning but also reveal subsequent medieval redevelopment and modification. The history of enclosure, management and cultivation of the land is evident in the landscape but is being eroded due to imbalance in activity (for example there is more arable land and less pasture now). The City of York provides a central focus for historic character and entertainment, education and recreation in the Vale, attracting local, national and international visitors. The development of the city through different periods can be experienced within the city walls.

- **Recreation**: Recreation and access are supported by the Yorkshire Wolds Way and Ebor Way long-distance routes, the network of footpaths (816 km at a density of 0.8 km per km²) and small areas of open access land (0.28 per cent of the area is open access land). The relatively little open access land in this NCA reflects the high levels of private land ownership; areas and old estates that are open to the public provide good opportunities for recreation. Within the City of York itself opportunities exist for recreation focused around historically important sites and themes. New developments provide opportunities to improve access to and recreation in a wider number of sites and areas and to ensure that the public realm remains accessible and does not become privatised.

- **Biodiversity**: The remaining heathland sites at Strensall Common and Allerthorpe Common and the river flood plain of the Lower Derwent Valley are designated as Sites of Special Scientific Interest for their nature conservation value. The Lower Derwent Valley Special Protection Area/Special Area of Conservation/Ramsar site is one of the most important traditionally managed, species-rich alluvial flood meadow habitats remaining in the UK. All the rivers and their corridors that flow through the Vale are important features for biodiversity, and reconnecting the rivers with the flood plain along these corridors and decreasing external pressures on them will have benefits for biodiversity.

Strensall Common and Allerthorpe Common feature the best remaining examples of heathland habitat in the NCA, supporting a number of rare invertebrates and birds.

Patches of semi-natural habitat and small features such as ponds, ditches, hedgerows and trees provide permeability to the wider landscape for biodiversity and act as important stepping stones through the agricultural areas. The NCA is a priority area for action to support farmland birds, species of which are declining.
Statements of Environmental Opportunity

SEO 1 - Identify opportunities within the existing agricultural systems to enhance landscape character and create a functioning ecological network to safeguard future food provision, retain soil quality and reduce soil erosion and deliver benefits for biodiversity, carbon storage and climate regulation.

For example by:

- Managing, restoring and thickening hedgerows, as well as replacing and planting new hedgerow trees to create species-rich hedgerows. This will help to create a network across the agricultural landscape which enhances sense of place and creates wildlife corridors.

- Encouraging sustainable agricultural practices that enhance the delivery of an increased range of ecosystem services from the land to increase soil quality, reduce soil erosion and improve water quality and management. Practices such as increased organic matter input, undersowing and inclusion of grassland into rotation will preserve the quality of the soils for future food production.

- Restoring field ponds and other features such as ditches, dykes, small woodlands and shelterbelts, to ensure that they are being adequately managed for their contribution to the landscape and biodiversity. This will help to maximise their contribution to the permeability of the landscape and their role as stepping stones connecting larger areas of habitat.

- Encouraging increased winter water storage in the agricultural sector to help it to be more self-sufficient and less reliant on more traditional sources of water supply.

- Retaining existing copses of woodland and bringing many back into active management along with shelterbelts and small woodlands to improve carbon storage levels, aid water infiltration and reduce wind erosion.

- Encouraging agricultural practices that support farmland birds and provide habitats for insects and pollination, such as diverse field margins and weedy stubble on fields.

- Incorporating miscanthus and short rotation coppice into the landscape with particular consideration to landscape character, avoiding semi-natural habitats such as heathland and wetlands, sites with high potential for shallow-buried heritage assets and areas of historic field patterns.

- Minimising the disturbance and damage to archaeological sites resulting from agricultural practices, including the evidence of bronze-age to Romano-British settlement on the western fringe.

- Strengthening historic field systems and patterns through hedgerow restoration and management, especially the older field patterns around villages.
SEO 2 - Manage and enhance the network of rivers and important wetland habitats within the Vale, increasing the landscape’s ability to naturally and sustainably manage flood and drought risk and provide other ecosystem services while recognising the needs of individual species and habitats and increasing the resilience of wildlife to climate change.

For example by:

- Restoring, extending and re-linking wet heathland habitat, natural washlands, valley mires, fens and swamps, fen meadows and drainage dykes to connect wetland habitat, particularly where appropriate in the river flood plains of the Ouse, the Derwent, the Wharfe, the Ure, the Nidd and the Foss – this may also assist in flood risk management.

- Encouraging new riparian and flood plain woodland that can increase the natural storage of carbon, reduce peak flow events and provide a potential future source of fuel, as well as enhance biodiversity and sense of place while retaining the value of grassland and wetland habitats.

- Restoring natural river courses and fluvial processes to increase the opportunities for slowing flood flows and for habitat creation, and to strengthen the contribution of the river valleys to the landscape.

- Seeking opportunities to provide natural flood risk management options upstream of frequently flooded areas and to reduce flooding in urban centres.

- Encouraging management of ditch networks that takes account of both flood risk management requirements and biodiversity opportunities through re-linking fragments and through sympathetic vegetation management.

- Maintaining undeveloped flood plains by encouraging inappropriate development away from flood plains if it could lead to a loss of semi-natural habitats.

- Seeking opportunities to revert arable farmland to permanent pasture in flood plains to reduce soil erosion and diffuse water pollution. This is particularly important in the catchment sensitive farming priority catchments of the Yorkshire Derwent and the Yorkshire Ouse, Nidd and Swale.
SEO 3 - Increase the network of species-rich meadows, pastures, fields and hedgerows, ensuring that they and the wider farmed environment are managed to reduce rates of diffuse pollution and improve water quality. Extend and enhance heathland sites on areas of sandy soil for the benefit of biodiversity, as well as enhancing sense of place.

For example by:

- Preventing further loss of semi-natural grasslands through improvement, and managing stocking regimes to minimise compaction and aid water infiltration.
- Conserving, extending and re-linking ‘ings’ meadows on the river flood plains, unimproved wet grasslands, and unimproved and semi-improved meadows and pastures.
- Creating grassland buffer strips in arable areas (around fields, watercourses and drainage ditches) linked to the wider grassland resource to create a grassland habitat network.
- Enhancing and creating field margins and hedgerows to create a network that increases connectivity between other areas of semi-natural habitat through the agricultural landscape.
- Managing and creating areas of semi-natural habitat to connect larger areas of biodiversity value and to create a permeable landscape for species migration and movement across stepping stones and a network of less hostile habitats through the arable landscape.
- Creating buffer habitats around areas of high biodiversity value and river systems to protect them from nutrient run-off.
- Restoring, extending and re-linking heathlands on the glacial sands to achieve a strong mosaic of habitats at different stages of succession, linking with existing habitats of high wildlife value.
- Encouraging heathland habitat creation after conifer plantations are felled where these plantations have been planted on former heathland sites.
SEO 4 - Protect the historic and cultural features of the Vale, in particular the traditional settlement patterns of remaining villages and the evidence of previous settlements that provide a strong sense of place.

For example by:

- Ensuring that new development, redevelopment and land use changes do not detract from the rural feel of the National Character Area (NCA), through selection of appropriate materials and development design.
- Encouraging development design that reduces flood risk, improves water quality and creates and restores semi-natural habitats that are functional as part of the wider landscape and provide opportunities for increased access and recreation.
- Maintaining the distinctive linear form of village settlements, with buildings set back behind wide grass verges and village greens, ponds, village churches, streams and mature trees; and seeking opportunities to improve the way in which village greens and urban commons such as the York Strays are managed.
- Conserving and enhancing local vernacular (mottled brick and pantile roofs) through restoration of traditional farmsteads, farm buildings and associated features (including traditional farm orchards) and use of traditional materials in conservation projects.
- Protecting and restoring remaining features of previous settlements, for example evidence of Roman settlement including forts, signal stations and roads and the medieval to 18th-century masonry bridges, traditional farmsteads and farm buildings that add interest and character to the landscape.
- Promoting sustainable land use to protect existing historic features and retain field patterns and their place in the landscape, and promoting educational visits and increasing educational access to and interpretation of historic buildings and archaeological sites.
- Identifying and enhancing archaeological and historical elements of the landscape to support habitat and access restoration work.
- Protecting and managing parkland associated with country houses, for example Rufforth Hall Park, Beningbrough Hall and Bilton Hall, to manage vistas and preserve veteran trees and to protect the historic elements and enhance natural features through selective planting and conservation.
- Preserving historic features, including dispersed brick farmsteads and those relating to shrunken settlements, moated sites in the south of the NCA, former medieval grange farms and 19th- and 20th-century military remains such as airfields and crash sites.
- Identifying opportunities to increase public access in the NCA and create new circular routes or links to existing rights of way, particularly the Yorkshire Wolds Way, the Ebor Way and the Trans Pennine Trail long-distance routes; and seeking opportunities to link access with the green space network and existing sites of semi-natural habitat where appropriate.
- Conserve the tranquillity of the Vale through sympathetic design and development plans, in particular minimising light spill through careful lighting design to retain the ‘undisturbed’ feel of the NCA and to lessen the development impact on the more rural areas.
1. Manage and protect the City of York to ensure that the sense of place and sense of history are maintained and are linked to wider opportunities for recreation for both local people and visitors.

For example by:

- Managing pressure for development outside the urban fringe, with development in the wider countryside and smaller settlements occurring, especially around the City of York, to maintain important views into historic features within the city and to retain the settlement patterns.
- Advocating the definition of development limits around York to ensure the enhancement of the setting of the historic city as the dominant settlement within the Vale.
- Extending and enhancing access between the City of York and the wider countryside, linking with long-distance trails and areas of important natural habitat.
1. Landscape and nature conservation designations

The Vale of York is bordered by the North York Moors National Park to the north and the Howardian Hills AONB to the east with small areas of these landscape designations (<1 per cent) falling within the NCA boundary.

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

<table>
<thead>
<tr>
<th>Tier</th>
<th>Designation</th>
<th>Name</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>Ramsar</td>
<td>Lower Derwent Valley</td>
<td>279</td>
<td>&lt;1</td>
</tr>
<tr>
<td>European</td>
<td>Special Protection Area (SPA)</td>
<td>Lower Derwent Valley SPA</td>
<td>311</td>
<td>&lt;1</td>
</tr>
<tr>
<td>National</td>
<td>National Nature Reserve (NNR)</td>
<td>Lower Derwent Valley NNR</td>
<td>129</td>
<td>&lt;1</td>
</tr>
<tr>
<td>National</td>
<td>Site of Special Scientific Interest (SSSI)</td>
<td>A total of 19 sites wholly or partly within the NCA</td>
<td>1,237</td>
<td>1</td>
</tr>
<tr>
<td>National</td>
<td>Site of Special Scientific Interest (SSSI)</td>
<td>Strensall Common SAC; Lower Derwent Valley SAC; River Derwent SAC</td>
<td>958</td>
<td>1</td>
</tr>
</tbody>
</table>

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.

The River Derwent and adjacent wetland habitats of the Lower Derwent Valley are designated along the river as it flows through the NCA and onwards into the Humberhead Levels NCA. The lower part of the river in this NCA and part of the nearby Pocklington Canal support large assemblages of breeding waders and this is recognised through their SPA designation. The heathlands of Strensall Common are designated SAC and together with the River Derwent and Lower Derwent Valley cover 958 ha (1 per cent of the NCA) of the Vale of York. The Lower Derwent Valley is designated both for its habitat and the bird populations these habitats support and carries SPA and SAC designations. All the areas that hold European designations are also designated SSSIs. There are 19 SSSIs which together cover 1,237 ha (1 per cent of the NCA) and represent hay meadow, northern ash woodland on chalk, fen and reedbeds and heathlands. There are 62 Local sites in the Humber Estuary covering 540 ha, which is 2% of the NCA.

There are 166 Local sites in the Vale of York covering 1,799 ha which is 2 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](http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm)

Details of Local Nature Reserves (LNR) can be searched: [http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp](http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp)

Maps showing locations of Statutory sites can be found at: [http://magic.defra.gov.uk/website/magic/](http://magic.defra.gov.uk/website/magic/) – select ‘Rural Designations Statutory’.
1.1.1 Condition of designated sites
A breakdown of SSSI condition as of March 2011 is as follows:

<table>
<thead>
<tr>
<th>SSSI condition category</th>
<th>Area (ha)</th>
<th>% of SSSI land in category condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unfavourable declining</td>
<td>58</td>
<td>5</td>
</tr>
<tr>
<td>Favourable</td>
<td>415</td>
<td>34</td>
</tr>
<tr>
<td>Unfavourable no change</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>Unfavourable recovering</td>
<td>740</td>
<td>60</td>
</tr>
</tbody>
</table>

Source: Natural England (March 2011)

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

2. Landform, geology and soils

2.1 Elevation
Elevation in the Vale of York ranges from a low point of 1 m above sea level to a maximum elevation of 207 m. The mean elevation across the NCA is 21 m.

Source: Natural England (2010)

2.2 Landform and process
The Vale of York is generally low lying and flat in character with any small variation in height provided by ridges and glacial moraines. The York Moraine forms a curving ridge extending from York eastwards to Sand Hutton, a line mirrored by the Escrick Moraine about 8 km to the south along the border of the NCA with the Humberhead Levels.

Source: Vale of York & Mowbray Natural Area Profile, Vale of York Countryside Character Area description

2.3 Bedrock geology
The underlying rocks of the Vale of York run in two strips north to south through the NCA. Mercia mudstone is present in the east of the Vale and Sherwood sandstone in the west. The influence of these rocks on the visible landscape is limited due to deep drift deposits that completely cover the area.

Source: Vale of York & Mowbray Natural Area Profile, Vale of York Countryside Character Area description

2.4 Superficial deposits
The rivers and historic glacial lakes in this area have left deposits of clay, sand, silts and gravel. These drift deposits include glacial till, which forms a marked bench in the east. Movement of the ice-sheet through this area has left both terminal and recessional moraines.

Source: Vale of York & Mowbray Natural Area Profile, Vale of York Countryside Character Area description

2.5 Designated geological sites

<table>
<thead>
<tr>
<th>Designation</th>
<th>Number of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geological Site of Special Scientific Interest (SSSI)</td>
<td>0</td>
</tr>
<tr>
<td>Mixed Interest SSSIs</td>
<td>0</td>
</tr>
</tbody>
</table>

There is 1 Local Geological Site within the NCA.

Source: Natural England (2011)

Details of individual Sites of Special Scientific Interest can be searched at:
http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm
### 2.6 Soils and Agricultural Land Classification

The major soil types for this NCA include clay and silt, sand and gravel and diamicton, covering 31, 27 and 22 per cent of the NCA respectively. The lacustrine and alluvial deposits provide good loamy soils that are fertile and support a high level of arable farming. The clay deposits are calcareous and are sometimes used for liming other poorer, sandy soils. The Vale of York has good quality agricultural soils, just over half of the area has soils classified as Grade 2 and almost a quarter is classified as Grade 3. Most of the highest quality agricultural soils (Grade 2 soils) are found in the south west and scattered across the northern half of the NCA.

Source: Natural England (2010)

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

<table>
<thead>
<tr>
<th>Agricultural Land Classification</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>210</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Grade 2</td>
<td>28,699</td>
<td>28</td>
</tr>
<tr>
<td>Grade 3</td>
<td>64,923</td>
<td>54</td>
</tr>
<tr>
<td>Grade 4</td>
<td>2,487</td>
<td>2</td>
</tr>
<tr>
<td>Grade 5</td>
<td>896</td>
<td>1</td>
</tr>
<tr>
<td>Non-agricultural</td>
<td>1,097</td>
<td>1</td>
</tr>
<tr>
<td>Urban</td>
<td>3,773</td>
<td>4</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>River Name</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Ouse</td>
<td>35</td>
</tr>
<tr>
<td>River Derwent</td>
<td>22</td>
</tr>
<tr>
<td>River Swale</td>
<td>16</td>
</tr>
<tr>
<td>River Ure</td>
<td>12</td>
</tr>
<tr>
<td>River Nidd</td>
<td>12</td>
</tr>
<tr>
<td>River Wharfe</td>
<td>10</td>
</tr>
<tr>
<td>Pocklington Canal</td>
<td>10</td>
</tr>
<tr>
<td>River Foulness</td>
<td>3</td>
</tr>
<tr>
<td>Cod Beck</td>
<td>2</td>
</tr>
</tbody>
</table>

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.

There are frequent stream courses and drainage channels within the landscape which link with the main rivers which cross the Vale. The floodplains of the Ouse, the Derwent, the Ure, the Nidd and the Fosse make up much of this flat landscape as they flow through the Vale of York into the Humber. The rivers Ure, Nidd and Wharfe all drain from the Magnesian Limestone ridge to the west of the NCA and join with the River Swale and River Ouse as they run south through the NCA into the Humber. These Rivers travel through the west of the NCA. The River Derwent drains the East of the NCA, travelling down from the Howardian Hills and the Rivers that drain the Vale of Pickering.
3.2 Water quality
The total area of Nitrate Vulnerable Zone is 88,241 ha, 86 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

4. Trees and woodlands

4.1 Total Woodland Cover
The NCA contains 4,924 ha of woodlands over 2 ha (5 per cent of the total NCA area), of which 825 ha is ancient woodland. General distribution of woodland across the NCA is scattered but in some areas provides a key part of the landscape at a local level.


4.2 Distribution and size of woodland and trees in the landscape
Woodland in the NCA consists mainly of scattered small and medium-sized stands with larger areas such as Sessay Wood and Wheldrake Wood unusual. Scattered woods north of York include remnants of the historic Galtres Forest. Recent planting has been undertaken in a scattered pattern with most new planting to the west of the City of York and in the northern part of the NCA between Haxby and Dalton. About 17 per cent of the woodland cover is on an ancient woodland site. The proportion of these sites covered by a Woodland Grant Scheme agreement has increased slightly since 1999 from 31 per cent to 33 per cent. The total area covered by Woodland Grant Scheme management agreements has been stable. Conifer plantations are a common woodland type within the Vale of York and much of the plantation planting has been undertaken on acidic and sandy soils. Within the agricultural landscape there are scattered field boundary trees that provide relief from the open field design. There are also small farm woods, shelterbelts and game coverts, all of which add diversity and interest to the landscape.

Source: Vale of York & Mowbray Natural Area Profile, Vale of York Countryside Character Area description

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

<table>
<thead>
<tr>
<th>Woodland type</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaved</td>
<td>2,499</td>
<td>2</td>
</tr>
<tr>
<td>Coniferous</td>
<td>1,523</td>
<td>1</td>
</tr>
<tr>
<td>Mixed</td>
<td>344</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Other</td>
<td>558</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Forestry Commission (2011)
Area and proportion of Ancient Woodland and Planted Ancient Woodland within the NCA

<table>
<thead>
<tr>
<th>Woodland type</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient semi-natural woodland</td>
<td>213</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Ancient re-planted woodland (PAWS)</td>
<td>612</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>


5. Boundary features and patterns

5.1 Boundary features

Most field boundaries date back to the Parliamentary enclosure period - around 1750 to 1850 – and are composed predominantly of hawthorn. A lack of upkeep of these traditional boundaries means that today the hedgerows are mainly gappy. Some of the most diverse and oldest hedgerows, containing field maple, hazel, holly and guelder rose, can be found along historic lanes or have resulted from assarting – the piecemeal clearance of woodland to create fields. An improvement to the low, flailed and intermittent hedgerows of the Vale has been seen in the past eight years due to a high take up of ELS boundary options. 1,350 km of hedgerow is within ES option to maintain and restore. This is the most common boundary feature with 64 km of ditches the next most commonly seen.

Source: Vale of York Countryside Character Area description; Countryside Quality Counts (2003)

5.2 Field patterns

Fields are medium to large size and enclosure is by low, flailed, often intermittent hedges with few hedgerow trees. This gives the landscape a generally large-scale, open, well-tended character where food production is the main emphasis of land management.

Source: Vale of York 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

1,089 farms in 2009 compared with 1,139 in 2000. The Vale of York forms part of a swathe of prime agricultural land that runs through the NCA from the Vale of Mowbray in the north to the Humberhead Levels in the south. The area is predominantly arable farming and there has been a steady move away from livestock rearing and dairy farming. From 2000 to 2009 the losses seen across dairy and specialist pig and poultry farms were a reduction of 50, 36 and 22 per cent respectively, while there was an increase of about 30 per cent in the number of cereal farms. The area has seen a general diversification in crops in recent years, particularly following the closure of the York sugar beet factory. The decline in grasslands seen before 1999 has not been reversed. Potatoes and carrots are widespread crops in the landscape but were only introduced in the early 20th century. The reduction in livestock rearing and dairy farming along with the intensification of arable farming in this area over the past fifty years – enabled through improved drainage and increased use of fertilisers – has led to a loss of traditional hay meadows and floodplain grazing marsh habitats in the NCA.

Source: Agricultural Census, DEFRA (2010)
6.2 Farm size
There is an even spread of farms of different sizes across the NCA with larger farms, over 100 ha, the most common. There has been a small reduction in the number of farms of all sizes.

Source: Agricultural Census, DEFRA (2010)

6.3 Farm ownership
2009: Total farm area = 82,336 ha; owned land = 55,842 ha
2000: Total farm area = 82,400 ha; owned land = 55,791 ha

Source: Agricultural Census, DEFRA (2010)

6.4 Land use
48 per cent of the farmed land is used for cereal crops; 39,236 ha. The next highest land use is grassland and uncropped land at 29 per cent of farmed area; 23,493 ha. In the years between 2000 and 2009 there was a drop in the area used to grow cash root crops – a 44 per cent reduction in area – and increases in the areas used for stock feed and oil seeds – 87 per cent and 95 per cent area increases respectively – this has been mainly driven by a large increase in prices for these commodities.

Source: Agricultural Census, DEFRA (2010)

6.5 Livestock numbers
Pigs are the most common livestock within this NCA (181,700 in 2009) followed by sheep (75,800) and then cattle (40,900). Between 2000 and 2009 there has been a large decrease in the number of pigs (76,000 fewer), a smaller decline in sheep numbers (11,000 less) and a small increase in cattle numbers (500 more).

Source: Agricultural Census, DEFRA (2010)

6.6 Farm labour
The vast majority of holdings are run by owner farmers (1,617) with only a very small number employing salaried managers (84). There has been a decrease in the number of salaried managers and full time workers on holdings in the period 2000 to 2009 with only a small increase in part-time workers filling these posts.

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
The NCA displays three distinct land cover types, agriculture, wetland and heathland. The main heart of the NCA is agriculture and within these areas small patches of woodland and hedgerows and semi-improved grasslands are the main natural habitats seen. Because higher grade agricultural soils are found in the north of the NCA more areas of priority habitat are found in the south and south-east of York City. As the River Ouse runs south of the City of York a fragmented corridor of floodplain grazing marsh remains.

Heathland habitat remains in some areas on the sandy soils of the east of the NCA. The two large areas of Strensall Common and Allerthorpe Common have the best examples of this type

Along the river corridors running down the western and eastern sides of the NCA mosaics of wetland habitats are found including floodplain grazing marsh and traditional hay meadows. In flood plain areas where drainage has occurred to increase agricultural land usage, there has been much improvement of grasslands that has reduced biodiversity in the swards and the loss of
associated insect and bird species.

**Broadleaved woodland**
The most common woodland community is common oak-bracken bramble woodland. The field layer vegetation is characterised by broad buckler fern (*Dryopteris dilatata*), brambles (*Rubus*) and sometimes bracken (*Pteridium*). In more established stands bluebells (*Hyathncoides nonscripta*) persist. In many places broadleaved woodlands were replanted with conifers, such as Sitka spruce (*Picea sitchensis*), or sycamores (*Acer pseudoplatanus*) for wood production. The coniferisation has led to a loss of traditional herbs, such as herb Paris (*Paris quadrifolia*) characteristic of ancient woodland.

Birch (*Betula*) woodland is more common in areas with acidic soil, often developing naturally on unmanaged heathland remnants. Important woodland bird species such as lesser spotted woodpecker (*Dendrocopos minor*), marsh tit (*Poecile palustris*) and spotted flycatcher (*Muscicapa striata*) are supported by woodland and parkland within the NCA at the northern reaches of their range.

**Coastal and floodplain grazing marsh**
Historically the meadows by the rivers in the Vale of York have been managed for hay-making and subsequent grazing and were common across a much wider area than seen today. There has been extensive loss of floodplain grazing marsh over the past century, particularly the recent past, where pressures from agriculture intensification and development have reduced the extent of this habitat; now only found close to the main rivers through the NCA. This NCA contains approximately 15 per cent of the total flood plain grazing marsh in England.

Characteristically supporting a high number of herbs such as great burnet (*Sanguisorba officinalis*), meadowsweet (*Filipendula ulmaria*), meadow buttercup (*Ranunculus austris*) and bistort (*Persicaria bistortia*) the floodplains also support a rich invertebrate assemblage. The floodplain grazing marsh of the Lower Derwent River support internationally important assemblages of overwintering and breeding wildfowl and waders such as Eurasian widgeon (*Anas penelope*) and Eurasian teal (*Anas crecca*). These areas are also important for a number of migrant bird populations in spring including ruff (*Philomachus pugnax*) and whimbrel (*Numenius phaeopus*) as they head back from overwintering in Africa.

**Lowland heath and acid grassland**
On the sandy, glacial soils of the NCA a few remnants of heathland remain. The most notable are Strensall Common and Allerthorpe Common where ongoing management is seeking to conserve and restore this habitat. The mixture of soils gives rise to diversity of habitats and plant communities. In dry areas heather (*Calluna vulgaris*) dominates with petty whin (*Genista anglica*) and birds-foot trefoil (*Ornithopus perpusillus*) amongst other species. In wetter areas cross leaved heath (*Erica tetralix*) is dominant. The diversity of flora supports important entomological and ornithological communities including breeding populations of European nightjar (*Caprimulgus europaeus*).

The sandy soils also represent the areas where conifer plantations have been focused. Work at Strensall Common has seen removal of an area of conifer plantation and the reintroduction of grazing to create natural restoration of the heathland at this site.

**Rivers and streams**
Rivers provide one of the most important ecological features of this NCA there is a wide diversity between different waterbodies and between them they support a wide range of species. A rich flora within the river and the banks supports a
good riverine insect community, in particular good suites of mayflies, stoneflies and caddis flies and a number of notable beetle species. The lower reaches of the River Derwent supports a high number of breeding waders such as goosander (*Mergus merganser*), common sandpiper (*Actitis hypoleucos*), oystercatcher (*Haematopus ostralegus*) and little ringed plover (*Charadrius dubius*) as well as large aggregations of non-breeding birds and over-wintering birds.

Source: Vale of York & Mowbray Natural Area Profile

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


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.

<table>
<thead>
<tr>
<th>UK BAP Priority Habitat</th>
<th>Area 9ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaved mixed and yew woodland (Broad habitat)</td>
<td>1,611</td>
<td>2</td>
</tr>
<tr>
<td>Coastal and flood plain grazing marsh</td>
<td>1,368</td>
<td>1</td>
</tr>
<tr>
<td>Lowland heathland</td>
<td>735</td>
<td>1</td>
</tr>
</tbody>
</table>

Note that the boundary of the NCA is the mean high water mark and thus open water and marine areas are not included.


### 7.3 Key species and assemblages of species

Maps showing locations of UK BAP Priority Habitats are available at: [http://magic.defra.gov.uk/website/magic/](http://magic.defra.gov.uk/website/magic/) – select ‘Habitat Inventories’

Maps showing locations of S41 species are available at: [http://data.nbn.org.uk/](http://data.nbn.org.uk/)

### 8. Settlement and development patterns

#### 8.1 Settlement pattern

The City of York is the main settlement in the Vale and, with the prominent Minster tends to dominate the area around it both visually and culturally. All...
the main roads in the Vale radiate from it. The city is expanding around the fringes and there are also significant satellite villages like Upper and Nether Poppleton and Haxby to the north and Bishopthorpe and Copmanthorpe to the south. Easingwold is a substantial rural town lying in the north of the Vale and has a distinctive intricate layout and a fine combination of open spaces and buildings within the landscape. Settlements across the NCA are distinctively linear in form with buildings set back behind wide grass verges. The Vale is scattered with large, brick built farmsteads.

Source: Vale of York Countryside Character Area description; Countryside Quality Counts (2003)

8.2 Main settlements
York is the main settlement within the Vale of York NCA. The total estimated population for this NCA (derived from ONS 2001 census data) is: 252,937.

Source: Vale of York Countryside Character Area description; Countryside Quality Counts (2003)

8.3 Local vernacular & building materials
The villages, like those in the Vale of Mowbray, exhibit the typical linear vale form of mottled brick houses with pantile roofs facing each other on either side of a main street. Wide grass verges and special features like village greens, ponds, streams and mature trees often combine with the village church and pub to create a very attractive whole. Farmsteads are larger here than in the more northerly Vale of Mowbray, with examples of the more prosperous agriculture dating from the 19th century. They are built, like most of the traditional buildings in the vicinity, in the characteristic mottled bricks and have pantile roofs. Older farmhouses are usually associated with a complex of large, more modern farm buildings.

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

9. Key historic sites and features

9.1 Origin of historic features
York Minster, built from stone brought from the Southern ‘Magnesian Limestone’ ridge to the west, is a highly visible landmark drawing the eye to the city from many of the outlying areas. The Romans established a legionary fortress at what was to become the major Roman centre of Eboracum, now York, using the higher ground of the York Morain. The area around York was significantly influenced by the Romans and there is much evidence of forts and signal stations as well as roads. Commons, often of a heathy character, were widespread in the Vale and some of these still survive today on the poor, wind-blown, sandy soils.

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

9.2 Designated historic assets
This NCA has the following historic designations:
- 10 Registered Parks and Gardens covering 488 ha
- 4 Registered Battlefield/s covering 966 ha
- 64 Scheduled Monuments
- 2,342 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

- 1 per cent of the NCA 1,181 ha is classified as being publically accessible.
- There are 816 km of public rights of way at a density of 0.8 km per km2.
- There is 1 National Trail (Wolds Way) cutting across 3km of the NCA.

Sources: Natural England (2010)

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

<table>
<thead>
<tr>
<th>Access designation</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Trust (Accessible all year)</td>
<td>1,180</td>
<td>1</td>
</tr>
<tr>
<td>Common Land</td>
<td>224</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Country Parks</td>
<td>12</td>
<td>&lt;1</td>
</tr>
<tr>
<td>CROW Access Land (Section 4 and 16)</td>
<td>542</td>
<td>&lt;1</td>
</tr>
<tr>
<td>CROW Section 15</td>
<td>221</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Village Greens</td>
<td>37</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Doorstep Greens</td>
<td>3</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Forestry Commission Walkers Welcome Grants</td>
<td>35</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Local Nature Reserves (LNR)</td>
<td>68</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Millennium Greens</td>
<td>5</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Accessible National Nature Reserves (NNR)</td>
<td>129</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Agri-environment Scheme Access</td>
<td>32</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Woods for People</td>
<td>412</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

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 Tranquility

Based on the CPRE map of Tranquillity (2006) the lowest levels of tranquillity are experienced within the City of York and along the roads that radiate out from this centre. Between the roads and main settlements the levels of tranquillity are quite high across the whole NCA, especially when compared to NCAs to the west. Mean levels of tranquillity get progressively higher moving further east across the NCA.

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

<table>
<thead>
<tr>
<th>Tranquillity</th>
<th>Tranquillity Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Value within NCA</td>
<td>52</td>
</tr>
<tr>
<td>Lowest Value within NCA</td>
<td>-80</td>
</tr>
<tr>
<td>Mean Value within NCA</td>
<td>5</td>
</tr>
</tbody>
</table>

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 the urban area of York has increased in size and, as a result, the area surrounding has seen vast increases in levels of disturbance. Increased use of the road network radiating out from York is having large impacts in terms of intrusion throughout the...
countryside across the wider Vale. A breakdown of intrusion values for this NCA are detailed in the table below.

<table>
<thead>
<tr>
<th>Intrusion category</th>
<th>1960s (%)</th>
<th>1990s (%)</th>
<th>2007 (%)</th>
<th>Percent-age change (1960s-2007)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disturbed</td>
<td>23</td>
<td>36</td>
<td>46</td>
<td>23</td>
</tr>
<tr>
<td>Undisturbed</td>
<td>75</td>
<td>61</td>
<td>50</td>
<td>-25</td>
</tr>
<tr>
<td>Urban</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are a large increase in the area of land considered being disturbed and a correlating decrease in the land considered undisturbed. The urban area has only increased slightly, by 2 per cent, so other factors are contributing to these figures.

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

12 Data sources

- Countryside Quality Counts Draft Historic Profiles, English Heritage (2004)*
- BAP Priority Habitats GIS data, Natural England (March 2011)
- Special Areas of Conservation data, Natural England (data accessed in March 2011)
- Special Protection Areas data, Natural England (data accessed in March 2011)
- Ramsar sites data, Natural England (data accessed in March 2011)
- Sites of Special Scientific Interest, Natural England (data accessed in March 2011)
- Source protection zones, Environment Agency (2005)
- National Parks and AONBs GIS boundaries, Natural England (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.
Recent changes and trends

**Trees and woodlands**
- The NCA contains 4,924 ha of woodlands over 2 ha (5 per cent of the NCA) of which 825 ha is ancient woodland. Woodland distribution across the NCA is generally scattered but in some areas forms a key feature in the local landscape.
- There has been scattered new planting to the west of York, and in the northern part of the NCA between Haxby and Dalton.
- The area covered by Woodland Grant Scheme management agreements has been stable. The proportion of ancient woodland sites covered by an agreement has increased since 1999 from 31 per cent to 33 per cent.

**Boundary features**
- The most frequent Countryside Stewardship agreements for linear features between 1999 and 2003 were hedge planting and restoration (71 km) and fencing (61 km), but extent was limited. The estimated boundary length for the NCA is about 8,156 km. At the end of March 2011 there was 1,351 km of hedgerows in Environmental Stewardship (ES). The other most common boundary options were 64 km of ditch in ES and 21 km of woodland.

**Agriculture**
- The decline in grasslands seen before 1999 has not been reversed and grazing pressure has remained more constant than in other areas. Thus agricultural character remains relatively stable.
- There is the perception that smaller farms are being amalgamated within larger farms as their tenures become available.

**Settlement and development**
- This NCA shows a high rate of development outside the urban fringe, with development in the wider countryside and smaller settlements observed especially around York.
- Pressure for development outside of the urban fringe and for food production are together putting a large pressure on the wetland system within the NCA both directly through loss of wetland habitats and in terms of increased water demand and increased water pollution through run off and discharges.

**Semi-natural habitat**
- The uptake of annual Countryside Stewardship Agreements for area features was consistently below the national average. The most extensive annual Countryside Stewardship agreements in 2003 were for lowland pastures on neutral/acid soils (477 ha) and over-wintered stubble followed by a spring/summer fallow (416 ha).

**Historic features**
- In 1918 about 2 per cent of the NCA was historic parkland. By 1995 it is estimated that 62 per cent of the 1918 area had been lost. About 30 per cent of the remaining parkland is covered by a Historic Parkland Grant, and 29 per cent is included in an agri-environmental scheme. About 65 per cent of historic farm buildings remain unconverted, and most are intact structurally.
Coast and rivers

- There is no evidence of Countryside Stewardship management agreements for riparian habitats. However, the biological river water quality in 1995 was predominantly excellent and it has been maintained. The chemical water quality in 1995 was predominantly very good and it has also been maintained.

- Historically the natural flood plains of the major rivers have been drained to increase land for agricultural use and further losses of semi-natural habitat has occurred due to an intensification of cultivation techniques and a move away from traditional land management practices.

Minerals

- There are two active sand and gravel quarries within the Vale of York, one west of Aine and the other at Newton upon Derwent. Any future opportunities for extraction will be for further sand and gravel extraction and they may provide opportunities for wetland habitat creation through site restoration.

Drivers of change

Climate change

Climate change is likely to result in:

- More frequent and extreme weather events resulting in increasing flood risk in river valleys of the Derwent, Swale, Nidd, Ure, Wharfe and Ouse, exacerbating existing flood problems within York.

- Increased storm events during summer months are having a negative impact on the biodiversity of the traditionally managed flood plain meadows. Bad weather during the traditional hay cutting period means that the quality of the habitats within many designated sites may be declining, in turn leading to a decrease in the species they support.

- Summer droughts leading to increased water demands. This would also result in lower flow levels in the rivers and less water being available for domestic, business and agricultural usage. Under these conditions we are likely to see a reduction in water quality through increased pollution concentration.

- Higher temperatures and prolonged periods of drought would put heathland vegetation under stress and increase the risk of wild fire events, which would impact on the diversity of structure and plant and animal species.

- Warmer winters leading to increased tree growth of predominantly non-native species which may have positive and negative results.

- A longer growing season potentially leading to double cropping.

- Warmer climate leading to new crops.

- Species migration and loss of small or isolated habitats.

- There will be pressure for renewable energy generation including onshore wind turbines, and growth of biomass crops (Defra’s maps show mostly medium or high potential yield for Miscanthus and a medium potential yield short rotation coppice).

For information on future mineral extraction sites we direct you to the most up to date Local Planning Authority Mineral Spatial Planning Document

For information on future mineral extraction sites we direct you to the most up to date Local Planning Authority Mineral Spatial Planning Document

- For information on future mineral extraction sites we direct you to the most up to date Local Planning Authority Mineral Spatial Planning Document

- www.defra.gov.uk/food-farm/growing/crops/industrial/energy/opportunities/yh.htm
Other key drivers

- Continued development in and around York – York acts as a focus for economic development, housing supply, and a hub for transport links. The final boundary setting of the York green belt will contribute to the management of the growth of the city – new development projects will provide the opportunity to deliver new homes, increased business capacity and a mix of tourism through land remediation, archaeological protection, flood risk management, green infrastructure provision and transport improvements.

- Development pressures within villages across the Vale risk mergence of separate villages, developments should seek to enhance the historic settlement pattern within the villages and avoid coalescing of settlements.

- Increasing need for waste management facilities and landfill capacity (the region currently performs poorly in terms of recycling and recovery).  

- Continued demand for sand and gravel (the Yorkshire and Humber Aggregate Mineral Resources map shows resources of sand and gravel in this area as well as some existing extraction sites).

- Increased focus for tourism.

- Increased pressure for food production.

- The potential planting of flood plain woodland is also high. Larger areas (more than 50 ha) are identified along key river corridors and watercourses such as the Ure, Nidd and Ouse, whilst smaller areas (more than 2 ha) are associated with smaller tributaries.

- Planning for improved flood storage and greater flood risk management will open up opportunities for increasing flood plains and flood storage areas and greater wetland habitat creation.

- As a result of the commercial scale agricultural use of the NCA, much of the land is identified as being at a high or very high vulnerability to poaching and subsequent soil erosion.

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10The Yorkshire and Humber Plan Regional Spatial Strategy to 2026, Government Office for Yorkshire and The Humber (May 2008)
11Opportunity Mapping for Woodland to reduce Flooding in the Yorkshire and Humber Region, Map 12, Forest Research (2009)
Supporting document 3: Analysis supporting Statements of Environmental Opportunity

The following analysis shows the projected impact of Statement of Environmental Opportunity on service provision:

<table>
<thead>
<tr>
<th>Statements of Environmental Opportunity</th>
<th>Ecosystem Service</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEO 1</strong>: Identify opportunities within the existing agricultural systems to enhance landscape character and create a functioning ecological network to safeguard future food provision, retain soil quality and reduce soil erosion and deliver benefits for biodiversity, carbon storage and climate regulation.</td>
<td><img src="image" alt="Table of ecosystem service changes" /></td>
</tr>
<tr>
<td><strong>SEO 2</strong>: Manage and enhance the network of rivers and important wetland habitats within the Vale, increasing the landscape's ability to naturally and sustainably manage flood and drought risk and provide other ecosystem services while recognising the needs of individual species and habitats and increasing the resilience of wildlife to climate change.</td>
<td><img src="image" alt="Table of ecosystem service changes" /></td>
</tr>
<tr>
<td><strong>SEO 3</strong>: Increase the network of species-rich meadows, pastures, fields and hedges, ensuring that they and the wider farmed environment are managed to reduce rates of diffuse pollution and improve water quality. Extend and enhance heathland sites on areas of sandy soil for the benefit of biodiversity, as well as enhancing the sense of place.</td>
<td><img src="image" alt="Table of ecosystem service changes" /></td>
</tr>
<tr>
<td><strong>SEO 4</strong>: Protect the historic and cultural features of the Vale, in particular the traditional settlement patterns of remaining villages and the evidence of previous settlements that provide a strong sense of place.</td>
<td><img src="image" alt="Table of ecosystem service changes" /></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Landscape attribute</th>
<th>Justification for selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open and low lying landscape, mainly agricultural land use dominated by arable fields.</td>
<td>- The NCA sits in contrast to the higher surrounding land, the open nature allows long views across the landscape.</td>
</tr>
<tr>
<td></td>
<td>- An important area for agriculture, the predominance of this land use along with the hedgerow boundaries has helped maintain the more rural setting of this NCA.</td>
</tr>
<tr>
<td></td>
<td>- The area has a long history of agriculture from cropmark evidence of previous settlements to scattered large brick farmsteads indicative of the agricultural prosperity of the 19th century.</td>
</tr>
<tr>
<td></td>
<td>- Increased diversification or changes in crops or land use will influence feel of landscape and the historic layout of the countryside.</td>
</tr>
<tr>
<td></td>
<td>- Underlying geology is hidden so subtle variation in land use is governed by the soil type and quality.</td>
</tr>
<tr>
<td></td>
<td>- Small ponds, ditches and hedgerows within the farmed environment provide extra features breaking up the landscape.</td>
</tr>
</tbody>
</table>
### Landscape attribute

<table>
<thead>
<tr>
<th>Rivers and their flood plains.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Rivers provide important backdrops for local landscape, with water a key theme throughout the area, and rivers are important features providing character to the NCA.</td>
</tr>
<tr>
<td>- There are a large number of rivers that drain through the NCA providing important north-south corridors for species migration.</td>
</tr>
<tr>
<td>- There is a great variety in the speed and size of the watercourses which mean the NCA as a whole supports a wide range of water dependent flora and fauna. This can particularly be seen in the Lower Derwent Valley, internationally designated wetlands; that supports large populations of breeding waders on the flood plain grazing marsh and neighbouring habitats.</td>
</tr>
<tr>
<td>- The high level of water passing through the NCA supports extractions for agriculture and other uses.</td>
</tr>
<tr>
<td>- Pressure on the land for agriculture means that flood plain habitats have become fragmented as more land has been used for crops or grazing. Restoring the network of habitats across the flood plain would benefit biodiversity and landscape and reduce flooding further downstream.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Heathland sites on poorer sandy soils along with scattered conifer plantations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Areas of heathland would have once been much more extensive within the landscape. This habitat, reliant upon human intervention, has been reduced in the NCA to two main areas which are designated as internationally important areas for the habitat and for the birds they support.</td>
</tr>
<tr>
<td>- The heathland habitat supports important entomological and ornithological communities, including breeding populations of European nightjars.</td>
</tr>
<tr>
<td>- Historically sandy soils are also where conifer plantations have been focused, these areas provide opportunities to revert back to heathland especially as this wood comes to maturity.</td>
</tr>
<tr>
<td>Landscape attribute</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Historic central City of York</td>
</tr>
<tr>
<td>Historic features and evidence of past settlements scattered through the landscape.</td>
</tr>
<tr>
<td>Distinctive settlement pattern of linear villages.</td>
</tr>
</tbody>
</table>
Landscape opportunities

- Conserve and protect the historic setting of the City of York and the traditional settlement patterns seen throughout the NCA that give the area a rural and open feeling. Plan to encourage development that is in-keeping with the current pattern of satellite villages in the wider countryside around York. Maintain a radial infrastructure network of roads and avoid 'filling in' developments or structures.
- Plan to conserve the settlement character by using traditional building materials in new developments.
- Restore and re-establish the network of hedgerows, which is not of high quality throughout the NCA and is replaced by fences in some places, to improve habitat connectivity through agricultural areas. Plan to increase native hedgerow trees in existing hedges and restore mixed native hedges to areas where they have been lost to enhance the traditional pattern and management of the landscape.
- Protect, manage and expand areas of lowland heathland. Encourage appropriate habitat mosaics at heathland sites to support a wide variety of species including populations of internationally important species such as the European nightjar. Where appropriate reduce, or thin, conifer plantations to increase heathland understorey and habitat to areas of poor quality and sandy soils.
- Maintain, enhance and expand the mosaic of habitats across the river flood plains. In particular areas in the Lower Derwent Valley and along rivers south of York there are opportunities to repair fragmented flood plain habitats. Plan to adapt agriculture in these areas to focus away from the river edge and to adopt complementary practices for wildlife, in particular land management practices such as haymaking. Plan to reduce impacts of agriculture and development on the riverine systems and increase flood plain grazing marsh.
- Protect and enhance mosaic of habitats and features. Small patches of semi-natural habitat, ponds and ditches on farms and in villages provide important stepping stones through the farmed landscape for species to use, adding diversity to the landscape and extra features of interest.
- Manage and enhance areas of native woodland within the Vale. Currently woodland is mainly restricted to small copses and individual trees within the agricultural areas with a few larger, generally non-native, plantations on poorer soils.
- Maintain quality and knowledge of archaeological evidence and historic built features across the NCA. Plan for land management practices to be sympathetic to potential evidence in the area and enhance public awareness of the breadth of historic wealth of the Vale.
- Plan to increase recreation and access across the NCA as there is currently little access for people to land outside of towns and villages and link to the long distance trails of the Yorkshire Wolds Way and the Ebor Way.

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 analysis and opportunities may change upon publication of further evidence and better understanding of the inter-relationship between services at a local level.
<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
<th>State</th>
<th>Main beneficiary</th>
<th>Analysis</th>
<th>Opportunities</th>
<th>Principal services offered by opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food provision</td>
<td>Cereal and root crops</td>
<td>54% Grade 3 soils. 28% Grade 2 soils. Predominantly arable farming with some livestock rearing and dairy farming.</td>
<td>Regional</td>
<td>The soil quality and water availability have supported high levels of agriculture in the NCA. Intensification of agriculture has led to the loss of semi-natural habitats, especially through drainage of flood plains which, in places has negative impacts on the viability of the natural elements that underpin food provision services. Flood events in summer lead to a loss of crops, which may be alleviated by the creation of semi-natural habitats within key locations within the flood plain to provide long term crop security. Many historic features are within the farmed environment, both obvious above ground and hidden features. Cultivation can damage archaeological features in agricultural fields; these features need to be taken into consideration in farm management plans.</td>
<td>Seek opportunities to expand food production sustainably; ensuring that by doing so it does not negatively impact on other ecosystem services. Encourage the use of sympathetic farming practices as described for other ecosystem services. Sustainable food production should be developed to maintain the historic features in the environment such as shallow cultivation. Opportunities to adapt to alternative crops or change the use of land to alleviate losses of current agricultural production in response to climatic changes and changes in flood risk.</td>
<td>Biodiversity, Sense of place, Food provision</td>
</tr>
</tbody>
</table>
## 28. Vale of York

### National Character Area profile:

#### Introduction & Summary

**Service**

**Assets/attributes: main contributors to service**

**Main beneficiary**

**Analysis**

**Opportunities**

**Principal services offered by opportunities**

<table>
<thead>
<tr>
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<th>Principal services offered by opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber provision</td>
<td>Conifer plantations Broadleaved woodland</td>
<td>Current woodland levels in the NCA are some of the lowest in the UK and timber provision is mainly from plantations on historic heathland sites. Total cover is 5% of the NCA and woodland is generally limited to small scattered broadleaved woodlands, although there are more extensive conifer plantations and remnant ancient woodlands on sandy soils in the south and east of the NCA.</td>
<td>Local</td>
<td>Further woodland planting in the NCA could increase opportunities for timber provision and there is potential to increase timber provision through bringing unmanaged woodland back under management. Planting would need to be sensitively located to increase biodiversity and retain rare species of flora and fauna. Planting should be avoided on heathland and wetland sites (except where wet woodland is appropriate) and could be targeted to copses and shelter belts around farmsteads.</td>
<td>Increase native woodland planting to provide increases in timber and biodiversity, enhance landscape and improve the ecological network. Expansion should also be considered to mitigate flood risk. Planting within the flood plain has been identified as a priority over the NCA with planting in the wider catchment, which could also bring benefits for flood mitigation, especially in the south of the NCA. ¹² Encourage better management of ancient woodlands and creation of new woodlands, prioritising planting to increase, buffer and link existing patches of habitat.</td>
<td>Climate regulation Water regulation Biodiversity Water availability Water quality Sense of place Biomass energy Timber provision</td>
</tr>
</tbody>
</table>

¹²Opportunity mapping for woodland to reduce flooding in the Yorkshire and the Humber region, Forest Research Monograph, 1, S Broadmeadow and T Nisbet (2010), Forest Research, Surrey
### 28. Vale of York

#### Analysis Opportunities Principal services offered by opportunities

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<tr>
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</thead>
<tbody>
<tr>
<td>Biomass energy</td>
<td>Woodlands (4,924 ha) Miscanthus Short rotation coppice</td>
<td>Currently limited, woodland cover is low and new large plantations unlikely. There has been an increase in biomass crops being grown around York since the closure of the sugar beet factory.</td>
<td>Local</td>
<td>There is a medium potential yield for miscanthus to the north-west of York and a high potential yield around and to the east of York. In the case of short rotation coppice, there is generally medium potential yield for short rotation coppice throughout the NCA. Impacts of this planting on landscape features can be found on the Natural England website.</td>
<td>In high potential yield areas planting of miscanthus can be targeted where it may help alleviate flood risk whilst avoiding impacts on the provision of other services. Improve management of woodlands to make them more productive for yielding biomass.</td>
<td>Climate regulation Regulating water flow Sense of place Biodiversity Soil erosion Biomass energy</td>
</tr>
</tbody>
</table>

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Service | Assets/attributes: main contributors to service | State | Main beneficiary | Analysis | Opportunities | Principal services offered by opportunities
--- | --- | --- | --- | --- | --- | ---
Water availability | Rivers, Aquifer, Canal | The western half of the NCA overlays the Sherwood sandstone aquifer, a major source of drinking water for the region. There is generally 'water available' for abstraction from this aquifer within this NCA. Environment Agency records suggest that in the south and south-west of York, the aquifer is 'over licensed'. There is high water demand from the rivers in the NCA and the River Ouse and its major tributaries, the Ure, Swale, Nidd and Foss, and the Pocklington Canal all have a resource availability status of 'no water available' for additional abstraction. Resource availability has not been accessed for the River Wharfe. The River Derwent is 'over licensed' within the NCA as it runs through the eastern section. | Regional | The River Derwent is a major public water supply for Yorkshire & Humber, providing a significant potable water resource to a number of large towns and cities stretching down to south Yorkshire. The rivers of the NCA provide water for agricultural irrigation as well as public drinking water. High levels of unsustainable abstraction create low flow levels that negatively impact on biodiversity and water quality in terms of Water Framework Directive assessment. Rainfall within the NCA is relatively low - current land uses persist because of abstraction and water management. | Opportunities to improve sustainable use of water and sympathetic land management practices. Increase areas of semi-natural habitats to increase infiltration such as grassland strips along water courses and creation of flood plain grazing marsh. | Biodiversity, Regulating water flow, Regulating water quality, Climate change adaptation, Food provision, Water availability

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14 Humber River Basin Management Plan, main document, Environment Agency (December 2009)
17 Humber River Basin Management Plan, main document, Environment Agency (December 2009)
19 Derwent Catchment Abstraction Management Strategy, Environment Agency (March 2006)
20 Wharfe and Lower Ouse Catchment Abstraction Management Strategy, Environment Agency (March 2005)
21 Derwent Catchment Abstraction Management Strategy, Environment Agency (March 2006)
### Climate regulation

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Soil</td>
<td>Soil</td>
<td>There is generally a low soil carbon content of 0-5% throughout the NCA. Two small pockets of very high carbon content soils of 20-50% are found around York and associated with sandy soils of the lowland heath at Strensall Common. Higher soil carbon content will be found under the remaining 4,000 ha of semi-natural habitats such as grazing marsh, wetlands and grasslands and the 3,691 ha of woodland.</td>
<td>International</td>
<td>There is currently high pressure on the grazing marsh, wetland and areas of semi-natural grassland from drainage of land for increased agriculture and development. In agricultural areas carbon sequestration and storage can be increased by management that reduces the frequency of cultivation and adds organic matter. Soils in the Vale currently provide low carbon storage partly due to cultivation and drainage. Reducing drainage and establishing permanent vegetation on soils, especially those derived from lake clays, would increase their capacity to store carbon. Increased woodland planting, combined with better management of woodland sites would increase carbon sequestration and storage. Semi-natural habitats can directly help regulate climate through providing cooling effects and reduction in run-off in developed areas and, indirectly through increased sequestration and storage of carbon. Seek opportunities to restore and expand woodland and semi-natural habitats and bring them under sympathetic management to increase carbon storage. Reduce frequency of cultivation and seek opportunities to add organic matter to the soils for example through use of green manure crops within rotations and increase uncultivated field margins. Reduce drainage intensity to increase carbon storage. Protect and expand areas of flood plain grazing marsh and wetland and grassland habitats.</td>
<td>Biodiversity</td>
<td>Regulating water flow and quality</td>
</tr>
<tr>
<td>Woodland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Regulating soil erosion</td>
</tr>
<tr>
<td>Wetlands</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Regulating soil quality</td>
</tr>
<tr>
<td>Species rich grassland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Water availability</td>
</tr>
</tbody>
</table>

22 NSRI National Soils Map for England and Wales, Environment Agency (January 2009)
<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/ attributes: main contributors to service</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Regulating soil erosion</td>
<td>Acid, sandy, loamy, clayey soils Semi-natural vegetation cover</td>
<td>Almost the entire NCA lies within one of Defra’s ‘Yorkshire Derwent’ or ‘Yorkshire Ouse, Nidd and Swale’ priority catchments with the light sandy soils across much of the Vale highlighted because they are prone to soil erosion. 48% of the soils in this NCA are not susceptible to soil erosion. Those that are include the naturally very wet very acid sandy and loamy soils (26% of NCA) that are easily eroded if heavily trafficked or after heavy rain. Soils are also prone to wind erosion. The slightly acid loamy and clayey soils with impeded drainage (11% of NCA) that is prone to compaction and capping / slaking, increasing the risk of erosion from surface water run-off, especially on steeper slopes. The freely draining sandy and loamy soils (together covering 14% of the NCA) are at enhanced risk of erosion on steeper slopes where bare or cultivated soil is exposed, exacerbated where organic levels are low after continuous cultivation or where soils are compacted. There may also be a risk of soil erosion where soils are left bare, especially in spring and in areas where root crops are grown intensively.</td>
<td>Regional</td>
<td>The high level of agricultural land use means that soil erosion is an important issue in this NCA, reducing soil erosion will retain the service and protect the local ability to farm the land profitably for the long term. Managing the land to reduce soil erosion may, in the short term, be a constraint to increasing food provision levels but will, in the long term help maintain the productivity of the land. The better management of soils and reduction in soil compaction will see improvements for water quality and flow in the NCA rivers and likely a corresponding improvement in biodiversity.</td>
<td>Changes in land management (as encouraged by catchment sensitive farming such as the use of cover crops), especially on areas of light, sandy soils would provide opportunities to improve soil structure and drainage and reduce rates of soil loss. Decreasing the frequency and intensity of cultivation, increase in field margins and grassland habitats, use of green manure crops and winter stubble. Management of stocking regimes could reduce compaction in areas where grazing is currently high to reduce poaching and compaction, with timing and good stock husbandry as key actions.</td>
<td>Regulating water quality Biodiversity Soil quality Food supply Soil erosion</td>
</tr>
</tbody>
</table>
### 28. Vale of York

<table>
<thead>
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<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulating soil quality</td>
<td>Low, flat topography</td>
<td>There are 8 main soilscape types in this NCA: Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils, covering 37% of the NCA; Naturally wet very acid sandy and loamy soils (26%); Slightly acid loamy and clayey soils with impeded drainage (11%); Freely draining slightly acid sandy soils (7%); Loamy soils with naturally high groundwater (6%); Loamy and clayey flood plain soils with naturally high groundwater (5%); Freely draining slightly acid loamy soils (4%); and Freely draining lime-rich loamy soils (3%). Compaction is a characteristic shared by the main soil types in this NCA.</td>
<td>Regional</td>
<td>The high agricultural grade soils in the NCA are important for food production. The slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (37% of the NCA) may suffer compaction and/or capping as they are easily damaged when wet. In turn, this may lead to increasingly poor water infiltration and diffuse pollution as a result of surface water run-off. In areas with slightly acid loamy and clayey soils with impeded drainage (11%) the soils are easily poached by livestock and compacted by machinery when the soil is wet and the weak topsoil structures can easily be damaged. Changing management practices to reduce damage to soil quality could provide increases in food production in the long term. Increases in soil quality will reduce negative impacts from farming on the natural environment through reduction in run-off pollution; this will improve water quality and biodiversity. Where sections of the waterbodies are canalised, silts are not deposited in the flood plain reducing one of the natural processes to maintain soil quality.</td>
<td>Seek opportunities to increase management measures that increase organic matter levels. Seek opportunities to reduce compaction through management of land. Time agricultural activities and livestock movements to avoid when the soil is very wet to maintain soil quality for future food production.</td>
</tr>
</tbody>
</table>

### Supporting documents

**National Character**

**Area profile:**

**Key facts and data**

**Analysis**

**Opportunities**

**Principal services offered by opportunities**

**Landscape change**

**Introduction & Summary**

**Description**

**Opportunities**

**Analysis**
## 28. Vale of York

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</thead>
<tbody>
<tr>
<td>Regulating water quality</td>
<td>Rivers, Aquifers, Agriculture</td>
<td>The ecological potential or status of waterbodies in the NCA is generally 'moderate' with some short river lengths of 'good' or 'poor' status.(^{23})</td>
<td>Regional</td>
<td>High levels of pesticides, nutrients (nitrates and phosphate) and sediment loads within the watercourses of the east of the NCA are a result of diffuse agricultural pollution associated with intensive arable production and a large area under root crops, which also contributes to increased soil erosion. In the west of the NCA high phosphate and pesticide levels are associated with the dominance of arable farming and the high proportion of pig and poultry farms. The River Foss flows are dominated by wastewater treatment work discharges and land drainage, and there has been evidence of reduced water quality and nutrient enrichment.(^{24}) There are opportunities on agricultural land to reduce water run-off through changes in management practices (as advocated by catchment sensitive farming).</td>
<td>Seek to increase grassland strips along field drains and watercourses to capture sediment and nutrients. Create buffer areas between nutrient input and sensitive riparian habitats, areas high in biodiversity and watercourses. Ensure the use of fertiliser and pesticide is more informed and associated with good in-field analysis to ensure input is exacting to reduce the volumes which are applied. Improve in-field soil management and protection to support sustainable crop production and reduce exacerbated soil erosion risks. Seek opportunities to diversify or adapt field management in areas of high risk crops, such as root crops, on vulnerable slope areas, areas adjacent to watercourses, prone soil types will reduce soil erosion and improve water quality regulation. Encourage crops with a lower demand for fertilisers to reduce diffuse pollution of water courses/aquifers from, for example nitrates and phosphates.</td>
<td>Regulating soil erosion, Biodiversity, Soil quality, Food provision, Climate regulation, Regulating water quality</td>
</tr>
</tbody>
</table>


\(^{24}\) Swale, Ure, Nidd and Upper Ouse Catchment Abstraction Management Strategy, Environment Agency (March 2004)
Regulating water flow

Rivers

Primary fluvial flood risk in this NCA is associated with the River Ouse catchment, which has a long history of flooding; particularly notable floods occurred in 1947 and 1982, and in 2000 when over 550 properties flooded between Linton-on-Ouse (north west of York) and Selby (south of this NCA).\(^{25}\)

In and around York there are a large number of properties – approximately 4,200 – at risk of flooding from the River Ouse following prolonged rain in the upper catchment, with a slow build-up in the flood risk. However, smaller urban watercourses through York are susceptible to more rapid flooding. Existing flood defences currently protect the City, but various washlands upstream of the City play a crucial role in managing the risk in York. Other communities at risk include Bishopthorpe and Haxby (both near York) which each have up to 2,000 properties at risk, and Strensall which has up to 1,000 properties at risk. The village of Lower Dunsforth in the north of the NCA can be completely cut off by flooding of the Ouse.\(^{25}\)

Regional

Environment Agency Catchment Flood Management Plan options (July 2010) identify opportunities for increasing flood storage in along the Ouse reaches in the NCA and downstream of York and outside the NCA, identifying opportunities to reduce flood risk through sustainable land management, changing land drainage practices, increasing surface roughness to reduce the likelihood of flooding around York and in the south of the NCA.

Re-naturalisation of the flood plain can dissipate energy from the water flow and increase the ability of areas to retain floodwaters upstream of flood risk areas. Changes to water regime could lead to changes in land viability for food production, or adaptive management techniques could ensure food production continues alongside a more natural flood regime.

Land management measures upstream in the river catchments may have beneficial effects to reduce flood risk downstream in the Vale of York. Additional planting of woodland on higher ground surrounding the NCA, linked with other habitat creation opportunities, in neighbouring NCAs may help mitigate flooding downstream within the Vale of York but will need to be sympathetic to existing habitats and species that could be directly and indirectly affected by the measure.


Seek opportunities to restore a more naturally functioning flood plain and river morphology.

Create and expand wetland habitats to increase water storage within the flood plains and slow down the movement of water in the system, holding back water in peak flow events to reduce flood risk further downstream.

There are opportunities to improve hedgerow density and tree belts to reduce cross land flows of flood water and retain high volumes of flood water in flood plains.

Promote sustainable drainage in developments to increase use of semi-natural habitats and permeable surfacing to reduce run-off and increase water filtration; slowing water entering the system.
28. Vale of York

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</thead>
<tbody>
<tr>
<td>Regulating water flow Continued</td>
<td></td>
<td></td>
<td><strong>Continued from previous...</strong> Seek appropriate opportunities for flood storage in locations where people and property are not at risk. This may present opportunities for changes in land use and management that can benefit ecosystems and biodiversity. In the Ouse catchment, the Environment Agency is looking to maximise the potential of flood storage, reduce run-off and tributary re-phasing which it thinks will result in a reduction in flow at York. The role of sustainable land management practices may also result in a reduction in localised flooding. Actions to be considered include changing land drainage practices; reducing practices that keep soil bare in wet periods; buffer and/or fallow strips; restoring grassland and improved hedge management.</td>
<td></td>
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</tr>
</tbody>
</table>
| Pollination                      |       | Regional         | Poor networks of pollinator habitat limit the ability for pollinators to supply this service. Increases in habitat for pollinators such as creation of areas of semi-natural habitat, hedgerow improvement and increases in field margins will increase the delivery of this service. These measures would create important corridors and habitat mosaics for pollinator species. A strong pollinator population supports production of a wider variety of food products and supports food production in the future. Seek opportunities to increase nectar provision within the agricultural landscape through promotion of diverse field margins and creation of more semi-natural habitats. Create networks of habitat through changes in management and improvements to hedgerows, road verges and field margins. Networks will support greater diversity of food production into the future. | Biodiversity  
Regulating water quality  
Food supply  
Climate regulation  
Regulating soil erosion  
Pollination |                                             |
### 28. Vale of York

#### National Character Area profile:

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<tr>
<td>Pest regulation</td>
<td>Existing semi-natural habitats, field margins and hedgerows</td>
<td>Although there are areas of semi-natural habitat within the NCA these are often fragmented. The existing field boundary hedgerows are commonly sparse and not diverse in species.</td>
<td>Local</td>
<td>Increasing diversity in species and structure of field margins will increase the ability for these areas to support populations of pest regulating species such as invertebrates, birds and mammals. There are opportunities to improve the network of semi-natural habitats across the NCA through appropriate management of existing habitats and creation of new areas of habitat.</td>
<td>Take opportunities to increase and manage appropriately semi-natural habitats. Seek opportunities to increase diversity of structure and composition within areas of semi-natural habitat to support a variety of pest regulating species. Seek opportunities to increase field margins, species rich hedgerows and beetle banks to encourage a network of habitats for pest regulating species close to areas of agricultural production.</td>
<td>Pest regulation, Pollination, Biodiversity, Food production</td>
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</table>
### A sense of place/inspiring places

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<tr>
<th>State</th>
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<th>Analysis</th>
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<tr>
<td>A sense of place is provided by the predominantly agricultural nature of this low-lying undulating landscape which is crossed by a number of low sandy ridges formed by glacial moraines or eskers and intervening flood plains of a number of rivers. Scattered shelterbelts and medium to large, predominantly arable fields enclosed by intermittent, low, flailed hedges with few hedgerow trees are typical and on higher ground more extensive conifer plantations on sandy soils, together with small woodlands create an impression of wooded farmland. Remnant heathlands and commons further underline the sandy nature of the ridges while reed beds and flood plain grazing marsh reinforces the character of the flood plains. The main settlement of the area, the City of York, dominates the area with its minster forming a distinctive landmark visible from long distances and with the main routes of the NCA radiating from its centre.</td>
<td>Regional</td>
<td>The NCA sense of place is provided by the large agricultural areas and the interplay between these and the numerous rivers and water courses that cross the valley. Increasing access to these features will increase understanding and appreciation of their importance.</td>
<td>There are opportunities to increase sense of place by protecting the open and rural feel of the NCA through retention of the field patterns and improved management and restoration of the hedgerow network. New woodland planting should be focused in small copes and shelterbelts around farmsteads and other naturally occurring woodlands. New and redevelopments should be sympathetic to the historic settlement patterns and materials used to maintain the ‘quaint’ village feel. Natural flood plain management and creation of wetland habitats will strengthen the impact of the waterways on the NCA sense of place. Preserve views to and from York and the principle landmarks by managing development so they do not tower over these landmarks and avoid locations that inhibit key views.</td>
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## 28. Vale of York

### National Character

#### Area profile:

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<tbody>
<tr>
<td><strong>A sense of history</strong></td>
<td>Field patterns, Local building materials, settlement and styles, City of York, York Minster, city walls, Historic events such as Battle of Stamford Bridge</td>
<td>A sense of history is evident in the remains of Roman settlements and associated Roman roads, forts and signal stations and the distinctive Roman fortress of York itself. Across the landscape there is a strong pattern of medieval nucleated settlement and distinctive linear villages (like those in the Vale of Mowbray). Large brick built farmsteads are also a common feature in the landscape. There is a strong vernacular of mottled brick with pantile roofs. The history of farming can be traced through the field patterns with large regular shaped fields (dating back to Parliamentary enclosure and before) and the wheel houses traditionally used for horse-powered threshing machinery while there are some remnants of woodland from the historic Galtres Forest north of York. Aspects of history that are likely to be most evident to the general public focus on the historic City of York with its distinctive Roman walls, York Minster, the fine collection of pre-17th-century traditional timber-frame buildings, and the City’s masonry bridges (one of two main concentrations of medieval and 18th-century bridges in England) and surrounding historic buildings and parklands including (Bilton Hall, Rufforth Hall, and Beningbrough Hall).</td>
<td>National</td>
<td>The varied historic features within the NCA are an important part of its character. The NCA has a high number of both upstanding and buried heritage. Loss of traditional village patterns and building materials from increased development pressure has been seen to some extent across the NCA to date especially as new developments tend to lack traditional features such as village ponds and greens the communities are built around. Continued expansion of larger villages and the City of York detract from the rural feel of the NCA. Parklands and the associated country homes give a sense of the wealth that the agricultural value of the area brought. These remain important historical assets.</td>
<td>Protecting the remains and artefacts found across the NCA through reducing damage from cultivation. Shallow tilling will protect cropmarks and ground features. Protecting the historic settlement pattern within rural villages and across the NCA as a whole through new developments. Maintenance of the large house estates along with their associated parkland will increase sense of history and their link to historical features in the landscape. Use local materials in buildings to maintain distinctive historical style of the area.</td>
<td>Recreation, Sense of place, Tranquility, Sense of history</td>
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### 28. Vale of York

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<tbody>
<tr>
<td><strong>A sense of tranquillity</strong></td>
<td>Dispersed, nucleated settlements Low population</td>
<td>50% of the NCA is classified as undisturbed</td>
<td>Local</td>
<td>This NCA has experienced a significant decline in tranquillity with undisturbed areas having decreased from 75% in the 1960s to current 50% level. The wide river valleys still provide tranquillity to the Vale. The main loss of tranquillity is associated with urban expansion and increased traffic on the roads radiating from York. A sense of tranquillity is still conveyed by the rivers and streams of the NCA, quiet open spaces within the City and by the parklands and remnant ancient woodlands.</td>
<td>There are opportunities to preserve sense of tranquillity by reducing development outside of existing settlements and resisting urban sprawl into relatively undisturbed areas. Inappropriate development next to rivers and streams should also be controlled to ensure these areas remain tranquil hotspots. Protection of parklands and quiet areas within the City of York would also help preserve a sense of tranquillity for people in these places. Increasing tranquillity by protecting areas of semi-natural habitats that currently provide this feeling, along with extending these habitats where possible will provide increases for biodiversity.</td>
<td>Sense of place Biodiversity Sense of tranquillity Sense of history</td>
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### 28. Vale of York

#### Service Assets/attributes: main contributors to service

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<tr>
<td>Recreation</td>
<td>The NCA offers a network of rights of way totalling 816 km at a density of just under 0.8 km per km² as well as a small amount of open access land covering 290 ha or just 0.28% of the NCA. In addition, the Ebor Way long distance route runs north-east to south-west passing through York and a very short section of the Yorkshire Wolds Way National Trail passes through the south-east corner of the area. The historic wealth of the City of York ensures it is a popular tourist destination.</td>
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#### Main beneficiary Analysis Opportunities Principal services offered by opportunities

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<tr>
<td>Regional</td>
<td>Large numbers of tourists visit York for its natural and historic features with recreation opportunities around these features high. Where these could be extended regarding natural features care will need to be taken to ensure that increased recreational pressure does not have negative impacts on the flora and fauna for example impacts of increased recreation on heathland sites. In comparison to this access for people living in the Vale is much lower than the national average. Access is very restricted in rural areas where large worked fields limit access and the rights of way network provides the primary access means. Extension of this network, especially where it can link people to woodlands, heathlands and river corridors should be a priority. Locally linear water features often provide good opportunities for recreation for example the River Ouse in York and the Pocklington Canal.</td>
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<tr>
<th>Opportunities</th>
<th>Principal services offered by opportunities</th>
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| Opportunities to increase recreation within the NCA both where there are natural features and historic elements to draw interest from locals and tourists. New developments in the City of York and its suburbs provide opportunities to increase recreation and link green spaces in York to the surrounding countryside. Opportunities to promote increased access and educational visits to farms. | Sense of place  
Sense of history  
Recreation |
## 28. Vale of York

### National Character Area profile:

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<tbody>
<tr>
<td>Biodiversity</td>
<td>Heathlands, Rivers, flood meadows, flood plain habitats</td>
<td>There are three internationally designated sites within the NCA, Lower Derwent Valley (SPA/SAC/Ramsar) the River Derwent (SAC) and Strensall Common (SAC), totalling 1% (958 ha) of the NCA area. There are also 20 SSSIs in the NCA, total 1% of the NCA area (1,237 ha). In 2011 36% of these are in ‘favourable’ condition; while 52% are in ‘unfavourable recovering’ condition and 12% are in ‘unfavourable’ condition.</td>
<td>National/ International</td>
<td>Lower Derwent Valley SPA/SAC/Ramsar is one of the most important traditionally managed species-rich alluvial flood meadow habitat remaining in the UK. The rivers and flood plains play a substantial role in the hydrological and ecological functioning of the internationally important Humber Estuary further downstream (outside the NCA). Key risks to the site include eutrophication (from agricultural run-off and domestic sewage discharges), water abstraction, and increasing recreational disturbance. The River Derwent SAC is vulnerable to both low water levels and flooding with new flood defences also posing additional issues. Poor water quality is also having a negative effect on the River habitat.</td>
<td>Increase in wetland habitats and defragmentation of the river corridor. There are opportunities to expand flood meadows and flood plain habitats along the river corridors. Increased buffer habitats around the internationally important Lower Derwent Valley site would also help reduce impacts of eutrophication for example by the creation of grassland strips. Management of the heathland sites to increase habitat mosaics and reduce tree cover will support populations of internationally important species such as European nightjar. Encourage biodiversity features to be incorporated into the farmed landscape and manage these habitats to maximise their value for biodiversity. Seek opportunities to extend and connect existing biodiversity rich sites through creation and management of semi-natural habitats and features in the wider landscape to act as stepping stones... Continued over...</td>
<td></td>
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26 Ramsar information sheet, Joint Nature Conservation Committee (accessed December 2010; URL: [www.jncc.gov.uk/pdf/RIS/UK11037.pdf](http://www.jncc.gov.uk/pdf/RIS/UK11037.pdf))
27 UK SPA data form, Joint Nature Conservation Committee (accessed December 2010; URL: [www.jncc.gov.uk/pdf/SPA/UK9006092.pdf](http://www.jncc.gov.uk/pdf/SPA/UK9006092.pdf))
28 UK SPA data form, Joint Nature Conservation Committee (designated April 2005; URL: [http://jncc.defra.gov.uk/ProtectedSites/SACselection/n2kforms/UK0030253.pdf](http://jncc.defra.gov.uk/ProtectedSites/SACselection/n2kforms/UK0030253.pdf))
29 UK SAC data form, Joint Nature Conservation Committee (designated April 2005; URL: [http://jncc.defra.gov.uk/ProtectedSites/SACselection/n2kforms/UK0030284.pdf](http://jncc.defra.gov.uk/ProtectedSites/SACselection/n2kforms/UK0030284.pdf))
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<tr>
<td>Biodiversity Continued</td>
<td></td>
<td></td>
<td></td>
<td>from previous</td>
<td>...The farmed environment includes many ponds, ditches, hedgerows, copses and field margins dispersed through the landscape. These features provide important connections through the managed landscape between larger areas of semi-natural habitat and are particularly important for farmland birds. The Vale of York is a priority area for farmland birds with a number of actions targeted for bird and flower species such as red hemp-nettle and corn bunting.</td>
<td>from previous</td>
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### 28. Vale of York

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<tr>
<td>Geodiversity</td>
<td>Glacial and superficial deposit, including moraines</td>
<td>Superficial deposits completely cover the area, obscuring any influence on landscape of the bedrock geology. Notable features are the terminal and recessional moraines left by movement of the ice sheet in this area.</td>
<td>Local</td>
<td>There are no geological SSSIs in the NCA. Large amounts of material were transported by meltwaters during the melting of the last ice age 15,000 years ago that formed a large spread of fluvio-glacial sand and gravel deposits across the Vale of York. Glacial till deposits from the retreating Vale of York ice sheet can be observed through the undulating landform. There is some sand and gravel extraction in the Vale which may provide opportunities through restoration process. Extensive lengths of river systems throughout the Vale have been canalised and artificially manipulated. Re-naturalising these sections would have benefits for other ecosystem services and would provide more opportunities to witness natural geomorphological processes. Whilst concealed the underlying Sherwood Sandstone Group provides a critical aquifer for the NCA.</td>
<td>Opportunities to explore bedrock geology are limited because few geological features are exposed due to the topography and overlying soils. These overlying features provide a number of opportunities to illustrate how the landscape developed in post-glacial times, the deposition of the moraine ridge, the formation of a lake over York, the development of windblown inland sand dunes can be related to the landscape, its deposits and soils and current use. Extraction of sand and gravel deposits may create exposures of interest. Take opportunities through the restoration process to increase areas of semi-natural habitats and improve local landscape character. Take opportunities to record temporary sections associated with extraction and retain permanent geological sections through the restoration process. Continued over...</td>
<td>Geodiversity</td>
</tr>
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### National Character Area profile:

#### 28. Vale of York

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</thead>
<tbody>
<tr>
<td>Geodiversity Continued</td>
<td></td>
<td></td>
<td></td>
<td><strong>from previous</strong>  ...The superficial deposits have strongly influenced the settlement pattern, land use and character of the NCA including the establishment of early settlements on the York and Escrick moraines, the distribution of habitats, such as heathland associated with windblown sands, the agricultural use of the fertile Vale and the provision of glacial clays (in particular) for brick making. The complex sequence of glacial sediments are also very important in our understanding and interpretation of the evolution of this landscape since the last ice age which has seen the advance and retreat of ice and the establishment of lakes such as the proglacial Humber Lake which extended over the southern part of the NCA.</td>
<td><strong>from previous</strong>  ...Seek opportunities to re-naturalise river systems and allow the rivers to follow their natural courses and increase understanding of processes within the landscape.</td>
<td></td>
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Natural England is here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England’s traditional landscapes are safeguarded for future generations.

Catalogue Code: NE367

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www.naturalengland.org.uk

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39. Humberhead Levels

Summary

Description

Opportunities

Key facts and data

Landscape change

Analysis

www.naturalengland.org.uk
Summary

The Humberhead Levels is a flat, low-lying and large scale agricultural landscape bounded to the west by the low ridge of the Southern Magnesian Limestone and to the east by the Yorkshire Wolds (north of the Humber) and the Northern Lincolnshire Edge with Coversands (south of the Humber). To the north it merges into the slightly undulating landscape of the Vale of York, at the line of the Escrick Moraine, and in the south it merges in to the Trent and Belvoir Vales and Sherwood.

There are several sites of international significance for their biodiversity, designated as Special Protection Areas and / or Special Conservation Areas. These include the lowland peatlands at Thorne and Hatfield Moors, the wetlands along the lower reaches of the River Derwent, and those stretches of the tidal rivers Ouse and Trent that fall within the Humber Estuary designated site. The Derwent and the Humber Estuary are also Ramsar sites. Sandy soils give rise to lowland heathland such as at Skipwith Common, which is an SAC. Thorne and Hatfield Moors, the Lower Derwent valley and Skipwith Common are also all National Nature Reserves. The Isle of Axholme is of international significance for its extensive strip field system, while other areas reveal distinct field and drainage patterns linked to past uses and drainage of the area.

In the central areas the large geometric fields are generally bounded by ditches and the highly productive agricultural land is maintained by pumping to keep the water table down. There are challenges to maintain this level of productivity whilst also addressing soil quality and erosion, in particular the oxidation of peaty soils. With the lower stretches of several major rivers draining across the area into the Humber Estuary, there are significant flood management issues to address, such as finding ways of extending flood storage and floodplains, which would also open up possibilities for expanding wetland habitats. Other opportunities include working collaboratively to manage water table levels and the network of ditches. Managed realignment schemes along the upper Humber are valuable in increasing the capacity of the estuary to hold flood waters, an issue exacerbated by rising sea levels.

There are important road, rail and water routes linking industrial areas to the east with the hinterland, and towns include Doncaster, Selby and Goole. Despite these busy areas, there are some very remote and tranquil areas, notably at Thorne and Hatfield Moors and the Lower Derwent Valley. The whole area is characterised by long views and big open skies.
Statements of Environmental Opportunity

- **SEO 1**: Safeguard, manage and expand the wetland habitats, including the internationally important lowland raised bogs, the floodplain grazing marsh, reedbeds, wet pastures and watercourses, to protect and enhance biodiversity, contribute to landscape character, address climate change and reduce flood risks.

- **SEO 2**: Manage the agricultural landscape to retain its distinctive character and its productivity, whilst improving its contribution to biodiversity, the protection of vulnerable soils and palaeo-environmental evidence, and the water resource.

- **SEO 3**: Manage the landscape features such as semi-natural habitats and historic field patterns that reveal local variations in landscape character, often arising from underlying soils and history of drainage, to enhance people's understanding and enjoyment of the landscape.

- **SEO 4**: Protect the open and expansive character of the landscape, its cultural features and sense of remoteness, by ensuring that new development is sensitively located, accommodates green infrastructure, retains long views and makes a positive contribution to biodiversity.
39. Humberhead Levels

Description

Physical and functional links to other NCAs

Several major rivers flow in from the north (Derwent, Ouse), the west (Aire, Went) and south (Don, Torne, Idle, Trent). They flow slowly across the Levels and join to form the Humber Estuary which flows out east to the North Sea. Land use and land management activities and actions undertaken upstream, especially in the uplands of the Pennines and the North York Moors, thus have a significant impact on these lower stretches of the rivers.

The rivers and the network of drainage ditches and dykes form important ecological corridors linking the Humber Estuary with areas upstream. A network of wetland habitats throughout this area is important to enable species movement in response to climate change, including adapting to pressures arising from sea level rise. There are also several navigable waterways crossing the area, including the Selby, Pocklington, Market Weighton, Calder navigation and Stainforth / Keadby Canals.

The Sherwood Sandstone aquifer, a strategically important source of water, underlies the western part of the area.

The higher ground of the Yorkshire Wolds to the north east, and to a lesser extent that of the limestone ridge to the west, provide extensive views out across the Levels. Within the NCA, there are long views across the arable landscape to the backdrop of the Wolds.

Distinct areas

- The Isle of Axholme
- Fishlake and Sykehouse pastoral landscape

Skipwith Common National Nature Reserve: open heath is maintained through grazing by ponies. Lowland heath still survives where underlying deposits of sand and gravel give rise to infertile soils.
A low-lying, predominantly flat landscape, with large, regular and geometric arable fields without hedges but divided by ditches and dykes, many of which form important habitats and key corridors for species movement.

Much of the land is at or below mean high-water mark and maintained by drainage, with fertile soils giving rise to one of the most productive areas for root crops and cereals.

Variations in underlying deposits create differences within the overall flat farmed landscape, including lowland raised mires and lowland heathland, many of which are of international ecological and historical importance.

Sandy deposits give rise to remnant lowland heaths which in places support remnant birch and oak woodlands, with some conifer plantations.

Heavier soils around Fishlake and Sykehouse result in a smaller scale pastoral landscape, with small, thickly hedged fields, ditches and ponds, and a network of small lanes.

Important historic landscapes include the Isle of Axholme, with evidence of mediaeval open fields, the warps (land enriched by regular silting) near Goole and cables (long thin strip fields) around Thorne.

Widespread evidence of drainage history, in particular the extensive drainage from the 17th century, revealed through canalised rivers, dykes, old river courses, canals, bridges and pumping stations.

Views to distant horizons are often long and unbroken, with big expansive skies, and vertical elements like water towers, power stations and wind turbines are very prominent.

Floodplains, washlands and traditionally grazed alluvial flood meadows (or Ings) associated with the major rivers and canals that cross the Levels give rise to important wetland habitats, supporting large numbers of wetland birds and wildfowl, especially over winter.

The waterlogged soils hold internationally important archaeological and palaeo-archaeological deposits.

Despite settlements, motorways and main roads, there is still a sense of remoteness to be experienced on the Levels, in particular on Thorne and Hatfield Moors and along the lower Derwent valley.

The Isle of Axholme is a long low ridge rising above the low-lying land that, before it was drained, was marshy and provided summer grazing and fishing. Extensive evidence of open strip fields remains on the Isle, while the water tower, windmill and church are vertical features visible from afar in the open expansive landscape.
Humberhead Levels today

The Humberhead Levels have a strong unity derived from their geological history. Over time the underlying mudstones and sandstones were eroded and then shaped by glacial lake sediments. This has created a very flat land enriched by alluvial deposits, making it one of the most productive cropping areas in Britain. It is flat and low-lying, with some land at or below the mean high water mark, and encompasses the broad floodplains of several major navigable rivers which drain into the Humber estuary. The farmland is intensively farmed, generally high input cereals and root crops, in very large, open, geometric fields divided by ditches and dykes, with scattered and fragmented semi-natural habitats.

The more recently reclaimed land is without trees or hedgerows, giving long views unbroken to distant horizons, with the sky playing an important part.

The long history of drainage and water management is evident in many areas, with rivers contained by flood embankments and a network of ditches, dykes and canals, with associated brick bridges, pumphouses and sluices.

Underlying deposits of sand and gravel, along with local outcrops of sandstones and mudstones, create distinct but subtle variations in the landscape within the overall flat, farmed levels. In the north deposits of sand and gravel support remnants of heathland, which make significant contributions to the landscape and biodiversity of the area, notably Skipwith Common National Nature Reserve. The lowland heaths support species such as heather, bog rosemary and round leaved sundew, with purple moor grass found alongside cross leaved heath in wetter patches. Some deposits of sand and gravel have been extracted, in particular in the south, while some of the less fertile sandy soils have been planted up with conifers, which break up the expanses of large arable fields.

The low-lying central levels, around Goole and the Ouse and Trent levels, have very fertile soils although constant pumping is required to enable cultivation. Traditional management of floodplain grazing marshes alongside lowland hay meadows and fen vegetation creates variations in structure and habitats that support bird populations such as lapwing, curlew and teal, with local populations increasing during winter with birds arriving from northern Europe. The rivers are important corridors for migratory salmon and sea trout. Along with the rivers and wetlands, the network of ditches and dykes form important corridors for species, including water voles, dragonflies and butterflies, and otters have been recorded in the area.

The lower Derwent valley running south to join the Humber estuary is a designated Special Area of Conservation and a Ramsar site, with a traditional riverine landscape with pastures, species rich meadows and well vegetated
field drains, framed by occasional small woodlands and waterside willows. Along with the nearby Pocklington Canal there is a strong sense of tranquillity and serenity in these traditionally farmed areas. Other wetland habitats occur along the floodplains of the rivers Don, Idle, Torne, Ouse and Aire. The proximity of the Humber estuary, designated as a Special Protection Area, Special Area of Conservation and a Ramsar site for its bird populations, and inter-tidal and saline habitats, makes the area important for large numbers of over-wintering birds and wildfowl such as the ruff, bittern and marsh harriers.

The largest extent of remnant raised bogs in England occurs here, at Thorne and Hatfield Moors. These are of international ecological and historical importance, and the previously extensive commercial peat production has now been halted, and work is being undertaken to restore the damaged peat areas. These moor landscapes are important for their communities of bog mosses and rich invertebrate populations including several species of dragonfly, wolf spiders, water beetles and the mire pill beetle. Along with heather, it is possible to find cranberry, cross leaved heath, cotton grass, bog rosemary and bog myrtle. There are also belts of scrub and fen woodland amongst the lowland heath and bog. Over 200 species of birds feed or breed here, including the hobby and merlin, and the numbers of nesting nightjar is a significant proportion of the western European population. There is a very strong sense of remoteness and tranquillity on these moors, despite the proximity of motorways and towns.

Underlying mudstone forms the low ridge of the Isle of Axholme, which retains extensive evidence of medieval open strip fields, of international significance. Combined with the nearby turbaries (where common rights to cut peat exist) at Haxey and Epworth, these historic landscapes reveal the earlier interdependence of the cropped land and settlements with the marshes, which provided rights of seasonal grazing, fishing, and peat cutting. Other historic field patterns include the warps (land enriched by regular silting) near Goole and cables (long thin strip fields) around Thorne.

North of Doncaster, around Fishlake and Sykehouse, heavier clay soils have given rise to a smaller scale pastoral landscape, with more livestock rearing and relatively small fields enclosed by thick hedges, some with evidence of ridge and furrow. There are still some traditional orchards associated with farmsteads, and there are networks of small lanes, ditches, and several field ponds.

Settlement is limited, with villages generally concentrated on slightly higher, drier ground. There are small market towns and more industrial centres like Doncaster, Goole and Selby. Building materials are red Barton brick and red pantiles, with slate being used in the north, but more recent development has used many different materials. Outside the villages there are dispersed large, relatively isolated farmsteads with brick and pantile farmhouses and other traditional farm buildings, along with large, sometimes industrial style, modern buildings reflecting the large scale arable agriculture.

The horizons are punctuated by water towers, major power stations such as Eggborough and the iconic grouping of cooling towers at Drax, and more recently several windfarms. The motorways M18 and M62 cut across the area, often on raised embankments, which increase their visibility but also provide views out across the open landscape. The strong traditions of angling and wildfowling remain popular.
The landscape through time

The landscape of the Humberhead Levels is influenced by glacial and alluvial deposits overlying bedrock dominated by Triassic Mercia mudstone and sandstone. To the west earlier Permo-Triassic Sherwood Sandstone underlies the area and provides an important aquifer. Many of the superficial deposits were laid down by the extensive glacial Lake Humber, formed when melt water from the last glaciation became trapped by further ice sheets. The lake has a complex history and the variations in its size and shape can be traced in the deposits. Following the escape of the water through the Humber Gap, the silt deposits left were reworked and added to by the numerous rivers that ran down from the Pennines to the Humber, with sand and gravel deposits being laid down. These fluvial deposits can be very varied, and include material brought down from both the Pennines and the Magnesian Limestone ridge to the west. Although the rivers cut channels through the Lake Humber deposits, these then filled due to rising sea levels, resulting in a predominantly flat landscape, with extensive flooding and wetting of the soils, and the development of large areas of peaty fen and bog.

In prehistory the lighter soils, to the north and south, were extensively cleared for small-scale pastoral farming. Between these areas the early landscape was marshy with a complex system of rivers and creeks. This remained largely unpopulated, although finds of prehistoric boats suggests that it was used for hunting and fishing. Large enclosures dating from the Iron Age have been discovered at Sutton Common, where wet soil conditions have preserved organic remains.

Roman activity has been recorded across the Humberhead Levels including farmsteads, roads, salterns, and pottery kilns. The extensive river system was used by invading Angles and Danes to penetrate deep into the country, although evidence of settlement from this period is scarce. This may be due to high deposition of alluvial soils in riverside and marshland areas which have masked archaeological remains.

Slightly higher drier land of fluvi-glacial deposits formed islands within the wetland, enabling early settlement during the medieval period. This is shown by the remnants of turbaries (peat cutting), retting pits, and ‘ridge and furrow’ fields as well as the largest stretch of open strip field systems in the country at the Isle of Axholme, which is of international significance. During this period towns developed along river trade routes and with occupiers of medieval ecclesiastical sites, began the process of land drainage, which was to be intensified during later periods. Moated sites, associated with heavy clay soils, were established to the north of Doncaster, and around the Isle of Axholme.

Dirtness pumping station is one of many attractive structures, along with bridges and sluices, which reveal the history of the drainage of the Levels.
Significant drainage activity began in the 1620s when Dutch drainage engineers began large-scale river diversions and land drainage. They introduced the practice of ‘warping’ where farmland was inundated with seasonally impounded tidal waters to deposit fertile alluvial silt. Drainage and warping continued during the 18th century and created today’s characteristic flat treeless landscape drained by a network of drains and dykes. In the 18th and 19th centuries new technologies encouraged more efficient drainage, and private and parliamentary enclosure followed, enabling increasingly productive agriculture. However the traditional pattern of livestock farming supported by hay meadows has survived on an unparalleled scale along the River Derwent.

In the 20th century this landscape had a role to play in both World Wars with military remains, airfields (one of which is now part of Skipwith NNR), and bombing decoys. It also continued to provide sources of energy, in particular through the major concealed coalfield accessed from Selby until 2004. The plentiful supply of water drawn from the main rivers for cooling, along with the local source of coal, resulted in the construction of several power stations, including the iconic Drax.

Over recent decades there has been continued pressure on the rural character of the area through expansion of housing and industry, including warehousing near the motorways and large agricultural sheds in rural areas, and recently a number of windfarms. Transport infrastructure continues to expand, with the development of an airport, and an inland freight and transport interchange at Rossington.

The intensive arable cropping has also continued, with a decline in mixed farming and a move towards more diverse crops such as flax, borage and maize. Root crops have declined since the closure of the local sugar beet factory. Livestock numbers have remained relatively low, with a substantial decline in pig numbers since 2000, and the size of holdings remains large.
Ecosystem Services

The following section seeks to identify the services offered by the landscape. A more expansive list of ecosystem services associated with this NCA are included in the Analysis section.

The Humberhead Levels 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 (under the constituent headings). Further information on ecosystem services provided in the Humberhead Levels NCA is contained in the ‘Analysis’ section of this document.

Provisioning services (food, fibre and water supply)

- **Food supply**: This is one of the most productive agricultural areas in the country, with 10% of the land classified as Grade 1, 33% as Grade 2, while a further 41% is Grade 3.

- **Water availability**: The availability of water is likely to become more critical with the anticipated effects of climate change such as summer droughts. The western half of the NCA overlays the major Sherwood Sandstone aquifer, which provides a strategically important source of water for domestic use as well as industry and agriculture, and needs to be replenished. Levels of abstraction of water from the rivers need to be managed carefully, and the demands of summer irrigation of crops may lead to an increase in construction of farm reservoirs.

- **Biomass**: The existing woodland cover offers limited potential for the provision of biomass through bringing unmanaged woodland under management. However, there is potential for increasing the area of biomass crops such as miscanthus; the extent of this will be determined by the market-led decisions of the many local power stations.

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

- **Regulating soil erosion**: The continued cultivation of peat soils, with the lowering of water table levels, is exacerbating the process of drying out and oxidisation of the peat, thus making them vulnerable to both wind and water erosion, while the organic content of the sandy soils is low. Agricultural practices should address protecting the soil resource from erosion by maintaining cover and increasing organic content.
A sense of history is associated with the management of water, evidenced by old river courses such as the Don, historic ditches, berms, dykes, canals, bridges, disused windmills, water towers and canals, reflecting both the reclamation of the area for cultivation, and the importance of the waterways as major transport routes. There are distinctly different historic landscapes such as the warps near Goole, the cables near Thorne, and the enclosed agricultural landscape around Fishlake and Sykehouse. In particular there are the remnant medieval open field patterns of the Isle of Axholme, one of the largest examples of open field strip cultivation, which is associated with Haxey and Epworth Turbaries, where traditional peat cutting rights were exercised.

Recreation: There are recreational opportunities associated with the National Nature Reserves at Thorne and Hatfield Moors, flagship reserves for providing access, while the paths along dykes and canalised watercourses provide ways of experiencing the remote open spaces.

Biodiversity:Whilst the predominant land use is agriculture, there are sites of international and national importance, including 2 Ramsar sites, 3 Special Protection Areas, 6 Special Areas of Conservation and 40 Sites of Special Scientific Interest, as well as 577 local wildlife sites. The lowland raised mires of the Humberhead Peatlands, the lowland heathland at Skipwith Common and the Lower Derwent Valley are all National Nature Reserves, while the Lower Derwent Valley and Humber Estuary are both Ramsar sites.

Tranquility: Although the area has experienced a significant decline in tranquillity since the 1960s, there are still significant areas of tranquillity at Thorne and Hatfield Moors, the Lower Derwent valley and around Fishlake and Sykehouse.
Safeguard, manage and expand the wetland habitats, including the internationally important lowland raised bogs, the floodplain grazing marsh, reedbeds, wet pastures and watercourses, to protect and enhance biodiversity, contribute to landscape character, address climate change and reduce flood risks. For example by:

- Seeking opportunities to restore and expand lowland raised bogs, and to bring adjacent land into management that will support these vulnerable habitats, including raising the water table levels and reverting arable land to pasture,
- Seeking opportunities to restore and expand floodplain meadows, wet pastures, grazing marsh, fens and other water dependent habitats, creating links where possible to improve the resilience of habitats to climate change and enable species movement,
- Working collaboratively with groups of farmers and landowners, Internal Drainage Boards and others to achieve comprehensive management of water table levels, raising them where appropriate to prevent peaty soils from drying out, support semi-natural habitats, and protect palaeo-environmental evidence,
- Encouraging cultivation practices that will maintain cover on vulnerable peaty soils and protect underlying palaeo-environmental evidence,
- Ensuring that managed realignment sites on the Humber are managed to create new intertidal and saline habitats that will maintain and enhance biodiversity and landscape character, whilst also providing effective flood defence,
- Optimising the benefits from extending washlands for flood storage, and accommodating occasional overtopping of flood defences through putting land down to wet pastures / floodplain grazing marsh, thus reducing flood risk elsewhere.
Manage the agricultural landscape to retain its distinctive character and its productivity, whilst improving its contribution to biodiversity, the protection of vulnerable soils and palaeo-environmental evidence, and the water resource

For example by:

- Ensuring that the network of ditches and dykes are brought under sound rotational management so that they continue to function whilst also retaining a proportion of emergent vegetation, thus forming key links between wetland and other semi-natural habitats, and providing important habitats for species such as water voles and dragonflies,

- Seeking opportunities to bring land adjacent to semi-natural habitats, especially wetland habitats, into appropriate management so that habitats can be protected from any potentially adverse impacts from nutrient run-off, chemical spray drift and/or reduction of water table levels,

- Encouraging the introduction of a wider range of habitats within the arable areas, such as permanent grassland field margins and buffers alongside watercourses and wetland habitats, and linking them where possible to other semi-natural habitats to create more resilient networks and enable species movement, whilst also reducing sediment and nutrient run-off,

- Encouraging the use of land management practices and arable options that enhance conditions for farmland birds and invertebrates,

- Encouraging the use of land management practices such as overwintering stubble and introducing fallow into rotations, to improve soil structure and organic content especially on sandy soils, and improve resistance to erosion on peaty soils,

- Seeking opportunities to create species rich grassland along the many miles of floodbank, thus providing support for pollinating insects within the agricultural landscape.
Manage the landscape features such as semi-natural habitats and historic field patterns that reveal local variations in landscape character, often arising from underlying soils and history of drainage, to enhance people’s understanding and enjoyment of the landscape.

For example by:

- Managing and expanding existing semi-natural habitats, including floodplain grazing marsh, lowland heathlands, fens, wet woodlands, wet pastures and meadows so that the influences of the underlying soils and drainage are made evident, establishing connecting networks of semi-natural habitats where possible, and enhancing their biodiversity value and their contribution to landscape character,

- Conserving the internationally significant medieval strip fields on the Isle of Axholme and actively seeking ways of encouraging land managers to retain the evidence of the strips,

- Conserving the strong patterns of cables and warps, as around Thorne and Goole,

- Conserving the ridge and furrow fields and managing and strengthening the pastoral landscape around Fishlake and Sykehouse, with its hedges, pastures and meadows, and typical moated farmhouses,

- Conserving the medieval strip fields, meadows and pastures of the Lower Derwent valley, for their historic interest as well as their contribution to landscape character and biodiversity,

- Ensuring that the existing lowland heaths are under sound management to achieve a robust habitat with mosaics of diverse structure and vegetation, to protect soils from erosion and enhance their biodiversity and contribution to the landscape,

- Seeking opportunities to interpret the influence of underlying deposits and the history of drainage of the area on the landscape of today, to expand people’s understanding and enjoyment of the landscape.
Protect the open and expansive character of the landscape, its cultural features and sense of remoteness, by ensuring that new development is sensitively located, accommodates green infrastructure, retains long views and makes a positive contribution to biodiversity.

For example by:

- Ensuring that development associated with transport corridors, Robin Hood airport and other urban and industrial expansion includes provision of green infrastructure and addresses flood risk mitigation.
- Ensuring that new developments are located and designed with particular consideration for keeping long views open, and limiting the use of native tree and shrub planting to integrate structures but without unduly impacting on the open character of the area.
- Ensuring that local styles and materials such as Barton brick are used in the restoration of traditional vernacular buildings.
- Seeking opportunities in the transport corridors to create and improve linear connections between habitats, to aid species movements.
- Restoring sand and gravel extraction sites to semi-natural habitats where possible so that they enhance biodiversity interest and make a positive contribution to landscape character, whilst retaining exposures and providing access where appropriate so that understanding of geodiversity can be improved.
- Minimising light spill and noise through careful control and design, in particular to retain the tranquillity in the more remote rural areas.
- Avoiding development which would impact on the lowland raised mires, heathlands and floodplain meadows, where there is a particularly strong sense of remoteness and high levels of tranquillity.
- Maintaining the long and unbroken views to distant horizons.

Parts of the Levels function as flood storage areas, and the river Derwent, which has avoided canalisation, regularly floods on to the adjacent grasslands as here at Aughton Ings. In the background can be seen Drax and Eggborough power stations.
Additional opportunities

**Plan for the improved enjoyment and understanding of the landscape and its subtle variations, its inspirational qualities, its biodiversity, geodiversity and historic interest, its role in producing food and mitigating climate change.**

**For example by:**

- Maintaining and improving the recreational opportunities provided by the network of canals, paths along flood banks, and navigable waterways, seeking opportunities to create circular routes linked to local towns and villages
- Conserving the network of drainage ditches, dykes, canals and other watercourses with all their historic features such as brick bridges, pumphouses, sluices, and old river courses
- Measuring, monitoring and recording elements of the historic environment to improve understanding and provide interpretation of the history of the area for residents and visitors
- Encouraging sustainable access to selected semi-natural habitats such as the lowland heaths at Skipwith Common, and the Humberhead Peatlands National Nature Reserves, a flagship for access, education and public enjoyment
- Providing interpretation to reveal the connections between geodiversity, historic development and the landscape of today with its biodiversity interest, agricultural production and subtle variations in landscape character
- Seeking opportunities for more people to be inspired by the long views, open skies, sightings of birds and other wildlife, and links to past ways of living, including traditional wildfowling.
Supporting document 1: Key facts and data

1. Landscape and nature conservation designations

There are no national landscape designations within this National Character Area. However, the Isle of Axholme is considered of international significance as the mediaeval open field strips are still in evidence over an extensive area.

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

<table>
<thead>
<tr>
<th>Tier</th>
<th>Designation</th>
<th>Name</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>Ramsar</td>
<td>Lower Derwent Valley, Humber Estuary</td>
<td>843</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>European</td>
<td>Special Protection Area (SPA)</td>
<td>Thorne &amp; Hatfield Moors SPA; Lower Derwent Valley SPA; Humber Estuary SPA</td>
<td>3,359</td>
<td>3%</td>
</tr>
<tr>
<td>Special Area of Conservation (SAC)</td>
<td>Thorne Moor SAC; Hatfield Moor SAC; Lower Derwent Valley SAC; Skipwith Common SAC; Humber Estuary SAC; River Derwent SAC.</td>
<td>4,598</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>National</td>
<td>National Nature Reserve (NNR)</td>
<td>Humberhead Peatlands NNR, Lower Derwent Valley NNR, Skipwith Common NNR</td>
<td>3,752</td>
<td>2%</td>
</tr>
<tr>
<td>National</td>
<td>Site of Special Scientific Interest (SSSI)</td>
<td>A total of 40 sites wholly or partly within the NCA</td>
<td>5,742</td>
<td>3%</td>
</tr>
</tbody>
</table>

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 5,722 ha. designated as SSSI, which overlap with the designations of Ramsar, SPA and SAC to a very great extent. Over 3% of the area is designated SSSI, comprising mostly lowland bogs, lowland heaths, wetlands, meadows and sandpits.

There are 577 Local sites in the Humberhead Levels NCA covering 7,264 ha which is 4% 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](http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm)

Details of Local Nature Reserves (LNR) can be searched [http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp](http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp)

Maps showing locations of Statutory sites can be found at [http://magic.defra.gov.uk/website/magic/](http://magic.defra.gov.uk/website/magic/) -select ‘Rural Designations Statutory’
1.1.1 Condition of designated sites
A breakdown of SSSI conditions as of March 2011 is as follows:

<table>
<thead>
<tr>
<th>SSSI condition category</th>
<th>Area in condition (ha)</th>
<th>% of SSSI land in category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unfavourable declining</td>
<td>194 ha</td>
<td>3.5%</td>
</tr>
<tr>
<td>Favourable</td>
<td>882 ha</td>
<td>15%</td>
</tr>
<tr>
<td>Unfavourable no change</td>
<td>430 ha</td>
<td>7.5%</td>
</tr>
<tr>
<td>Unfavourable recovering</td>
<td>4,223 ha</td>
<td>74%</td>
</tr>
</tbody>
</table>

Source: Natural England (2011)

Details of SSSI condition can be searched at: [http://www.sssi.naturalengland.org.uk/Special/sssi/reportIndex.cfm](http://www.sssi.naturalengland.org.uk/Special/sssi/reportIndex.cfm)

2. Landform, geology and soils

2.1 Elevation
Elevation ranges from extensive areas at or just below sea level, to a few low undulations that rise above 10m. Mean elevation is around 6m, and the only extensive higher land is the low ridge of the Isle of Axholme, which rises to around 30m above sea level.

Source: Humberhead Levels Countryside Character description

2.2 Landform and process
The Levels are largely flat, with subtle rises in landform reflecting underlying deposits of sand and gravel.

Source: Humberhead Levels Countryside Character description

2.3 Bedrock geology
The solid geology is poorly visible within the Humberhead Levels, being largely obscured by superficial glaciolacustrine, glaciofluvial and alluvial deposits. The underlying bedrock geology comprises Permian rocks in the west, and Triassic Sherwood Sandstone and Mercia Mudstone groups, with the Lias group in the extreme east. There are significant aquifers in the Sherwood Sandstone group and Permian rocks. There are a few higher areas where ridges of the underlying sandstones or mudstones rise above the alluvium, notably the low ridge of the Isle of Axholme.

Source: British Geological Society

2.4 Superficial deposits
North of the river Aire there are glacial Lake Humber deposits of glaciolacustrine clays and glaciofluvial sand and gravel, with some till. South of the river Aire, the superficial deposits are alluvium and river terrace gravels of the Humber estuary and associated rivers, peat and blown sand, creating a largely flat landscape with local undulations. There are extensive areas of glaciofluvial and river terrace sands and gravels, which give rise to infertile free draining soils, some planted with conifers and others worked commercially, leaving a legacy of restored or partly restored gravel pits. Peat and peat soils occur along former river channels and flood areas, and Thorne and Hatfield Moors comprise the largest extent of lowland raised bog in England.

Source: Humberhead Levels Natural Area profile; British Geological Society
2.5 Designated geological sites

<table>
<thead>
<tr>
<th>Designation</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geological Site of Special Scientific Interest (SSSI)</td>
<td>2</td>
</tr>
<tr>
<td>Mixed Interest SSSIs</td>
<td>1</td>
</tr>
</tbody>
</table>

There are 18 local geological sites within the NCA

Details of individual Sites of Special Scientific Interest can be searched at [http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm](http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm)

Source: Natural England (2011)

2.6 Soils and Agricultural Land Classification

The soils vary considerably depending upon the underlying deposits. About half of the NCA has loamy and clayey soils, many of them with naturally high groundwater. Across much of the central low-lying area the water table is maintained at a low level to enable cultivation throughout the year by a very extensive system of pumping. There are small areas of deep peaty soils, notably at Thorne and Hatfield Moors. These soils are at risk of shrinkage and oxidation, and wind erosion where surfaces are bare. About 30% of the NCA has free draining sandy soils which are prone to water erosion on slopes, and wind erosion where bare.

The area contains some of the most productive soils in the country, with 43% classified as Grade 1 and 2, and only 15% below Grade 3 or non-agricultural.

Maps showing locations of Statutory sites can be found at: [http://magic.defra.gov.uk/website/magic/](http://magic.defra.gov.uk/website/magic/) - select ‘Landscape’ (shows ALC classification and 27 types of soils)

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

<table>
<thead>
<tr>
<th>Grade</th>
<th>Area in (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>16,736 ha</td>
<td>10%</td>
</tr>
<tr>
<td>Grade 2</td>
<td>55,874 ha</td>
<td>33%</td>
</tr>
<tr>
<td>Grade 3</td>
<td>71,260 ha</td>
<td>41%</td>
</tr>
<tr>
<td>Grade 4</td>
<td>14,764 ha</td>
<td>9%</td>
</tr>
<tr>
<td>Grade 5</td>
<td>3,405 ha</td>
<td>2%</td>
</tr>
<tr>
<td>Non-agricultural</td>
<td>4,165 ha</td>
<td>2%</td>
</tr>
<tr>
<td>Urban</td>
<td>5,415 ha</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: Natural England (2010)

39. Humberhead Levels

Supporting documents
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 Trent: 38 km
- River Idle: 38 km
- River Torne: 32 km
- River Aire: 32 km
- Aire and Calder Navigation: 26 km
- River Don: 24 km
- Stainforth and Keadby Canal: 24 km
- River Ouse: 24 km
- River Derwent: 19 km
- River Foulness: 19 km
- River Went: 14 km
- Dutch River: 10 km
- Market Weighton Canal: 9 km
- Selby Canal: 9 km
- New Junction Canal: 9 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.

Much of the central area lies close to or even below sea level, where continued settlement and agricultural activity is dependent upon a complex system of drainage, achieved through a network of ditches, drains and dykes. The lower stretches of several major rivers (above) cross the Levels to join the Humber estuary which flows east into the North Sea. There are also several navigable waterways crossing the area, emphasising its importance as a route for moving agricultural produce, raw materials and manufactured goods between the North Sea and the industrial hinterland. The western half of the area overlies the Sherwood Sandstone aquifer, an important water supply.

3.2 Water quality
The total area of Nitrate Vulnerable Zone is 125,408 ha, 73% of NCA.

Source: Natural England (2010)

3.3 Water Framework Directive

4. Trees and woodlands

4.1 Total woodland cover
The NCA contains 6,683 ha of woodland (4% of the total area), of which just 945 ha (1%) is ancient woodland, reflecting the fact that much of the land has been relatively recently reclaimed.

Source: Natural England (2010)

4.2 Distribution and size of woodland and trees in the landscape
Woodlands are limited in extent, except in the areas of sandy soils to the north and south where remnant birch (Betula spp) and oak (Quercus spp.) woods along with some extensive conifer plantations occur, and on Thorne and Hatfield Moors. There are few hedge or hedgerow trees, except in the more
pastoral enclosed landscape on clay soils around Fishlake and Sykehouse, where there are also some traditional orchards associated with farmsteads.

Source: Humberhead Levels Countryside Character description

### 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)

<table>
<thead>
<tr>
<th>Woodland type</th>
<th>Area in NCA</th>
<th>Proportion of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaved</td>
<td>3,812 ha</td>
<td>2%</td>
</tr>
<tr>
<td>Coniferous</td>
<td>1,440 ha</td>
<td>1%</td>
</tr>
<tr>
<td>Mixed</td>
<td>423 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Shrub / young trees</td>
<td>632 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Felled/land for prepared planting</td>
<td>377 ha</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Source: Natural England (2010)

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

<table>
<thead>
<tr>
<th>Woodland type</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient semi-natural woodland</td>
<td>301</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Ancient re-planted woodland (PAWS)</td>
<td>644</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>


5. Boundary features and patterns

#### 5.1 Boundary features

Many of the fields have been created on drained land, so boundaries are dykes and ditches. Hedges are only frequent in the pastoral enclosed landscape around Fishlake and Sykehouse, and in some of the other slightly higher and drier arable landscapes away from the central low-lying levels.

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

#### 5.2 Field patterns

Fields are generally large, regular and form strong geometric patterns. There are localised areas of other striking field patterns, notably the extensive open strip fields from mediaeval times on the Isle of Axholme, of international significance. There are also long thin cables near Thorne, long strips of warp lands near Goole and a complex of ancient strip-farmed meadows along the Lower Derwent Valley. Smaller irregular fields enclosed by hedges occur in the pastoral landscape around Fishlake and Sykehouse.

Source: Humberhead Levels 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
High input cropping systems dominate the area, with cereals and root crops predominating. There is limited livestock rearing, with only 13% of holdings involved in grazing livestock, and some specialist pig and poultry enterprises. Since 2000 there has been a reduction in general cropping, with a move towards more diverse cropping enterprises such as flax, borage, field beans, peas for dry harvesting, maize and miscanthus.

Source: Agricultural Census, DEFRA (2010)

6.2 Farm size
Farm holdings are generally large, with 24% of holdings over 100 ha. in size which make up 72% of the farmed area. However there is also a high number (24%) of holdings between 5 and 20ha. The number of holdings under 5 ha. (less than 0.5% of the area) has reduced considerably over the past decade and is now just 10% of holdings.

Source: Agricultural Census, DEFRA (2010)

6.3 Farm ownership
75% of the total farmed area is owner occupied, although there has been a slight increase in the tenanted farm area since 2000.

2009: Total farm area = 124,974 ha; owned land = 93,554 ha
2000: Total farm area = 131,136 ha; owned land = 99,842 ha

Source: Agricultural Census, DEFRA (2010)

6.4 Land use
The predominant land use is arable cropping – cereals, roots, oilseeds, stock feed and other arable crops – which accounts for 48% of the farmed area, with grassland and uncropped land accounting for just 22%. Oilseeds and other arable crops have increased in area while cash root crops have decreased. The loss of set-aside (included in the 2000 figures) has not had much impact, possibly because it was limited in extent within this NCA, usually confined to soils unsuitable for cropping.

Source: Agricultural Census, DEFRA (2010)

6.5 Livestock numbers
As a primarily arable cropping area, numbers of cattle and sheep are relatively low, and have stayed low over the past decade. Pigs are the most numerous livestock, but their numbers have decreased significantly from nearly 238,000 in 2000 to 133,800 in 2009.

Source: Agricultural Census, DEFRA (2010)

6.6 Farm labour
The majority of holdings are run by principal farmers, but since 2000 there has been a general trend towards a reduction in numbers of those engaged in agriculture, with significant reductions in full time farmers and casual workers.

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
There are important biodiversity resources associated with the variations in soils and hydrology. One of the most important are the lowland raised bogs of Thorne and Hatfield Moors, which support bog mosses (Sphagnum species), nightjars (Caprimulgus europaeus) and notable assemblages of invertebrates, including dragonflies and the mire pill beetle. The numerous watercourses and associated floodplains and wetlands are highly valued for the range of species that they support, in particular strong populations of water voles (Arvicola amphibious) and otters (Lutra lutra). They also have an important function as ecological networks across an intensively farmed landscape. Of particular note is the extensive and intact flood meadow landscape in the Lower Derwent Valley and Pocklington Canal. The wetlands support large assemblages of overwintering wetland birds such as lapwings (Vanellus vanellus) and ruff (Philomachus pugnax).

Intertidal and saline habitats along the Humber are also important for populations of waders, including bitterns (Botaurus stellaris). On free draining sandy soils remnants of lowland heathland have survived which comprise species such as heather (Calluna vulgaris), bog rosemary (Andromeda polifolia) and round leaved sundew (Drosera rotundifolia), alongside species such as cross leaved heath (Erica tetralix) in wetter areas. In addition the NCA contains important arable habitats. These support nationally important assemblages of arable birds.

Source: Humberhead Levels Natural Area Profile, Natural England (2012)

7.2 Biodiversity Action Plan (BAP) priority habitats
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.

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal &amp; floodplain grazing marsh</td>
<td>6,058 ha</td>
<td>4%</td>
</tr>
<tr>
<td>Broadleaved mixed &amp; yew woodland (Broad Habitat)</td>
<td>3,871 ha</td>
<td>2%</td>
</tr>
<tr>
<td>Lowland raised bog</td>
<td>3,103 ha</td>
<td>2%</td>
</tr>
<tr>
<td>Reedbeds</td>
<td>2,032 ha</td>
<td>1%</td>
</tr>
<tr>
<td>Lowland meadows</td>
<td>877 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Lowland dry acid grassland</td>
<td>734 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Fens</td>
<td>512 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Lowland heathland</td>
<td>487 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Purple moor-grass and rush pasture</td>
<td>94 ha</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Source: Natural England (2011)

7.3 Key species and assemblages of species
Maps showing locations of UK BAP Priority Habitats are available at: [http://magic.defra.gov.uk/website/magic/](http://magic.defra.gov.uk/website/magic/) – select ‘Habitat Inventories’

Maps showing locations of 541 species are available at [http://data.nbn.org.uk/](http://data.nbn.org.uk/)
8. Settlement and development patterns

8.1 Settlement pattern
The population is generally low, with a few large towns notably Doncaster, Selby, Thorne and Goole on the navigable rivers and canals. Goole still has working docks providing access to the Humber estuary and thus the North Sea. Elsewhere there are small towns and large villages on the slightly higher and thus drier land, and there are large dispersed farmsteads throughout the area.

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

8.2 Main settlements
Doncaster, Selby and Goole are the main settlements, but generally the low population is dispersed in small towns and large villages including Bawtry, Thorne, Stainforth, Askern, Howden, Epworth, Crowle, Gilberdyke, Belton, Holme on Spalding Moor, Eggborough, Church Fenton and Ranskill. The total estimated population for this NCA (derived from ONS 2001 census data) is: 363,270.

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

8.3 Local vernacular and building materials
Buildings in the villages tend to be of mixed materials and styles, with 2-storey farmhouses and combination barns in brick and pantile in the open countryside. 76% of historic farm buildings remain unconverted, of which about 77% are intact structurally.

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

9. Key historic sites and features

9.1 Origin of historic features
There is evidence of prehistoric settlement on sand and gravel deposits raising land above the marshes. Watercourses were important routes, and wetlands were used for hunting, fishing and summer grazing. In places the wet soils have preserved evidence well, as at Sutton Common. Roman farms, salterns and potteries have been recorded across the Levels, although there is only slight evidence for later Saxon use of the area. There are many historic villages with associated field systems and turbaries dating from Medieval times. Significant medieval towns include Selby, Thorne, Epworth and Howden. Moated sites are a feature around the Isle of Axholme and north of Doncaster. The Isle of Axholme retains extensive and important evidence of strip fields of this period. Ridge and furrow fields are a feature of the pastoral areas around Fishlake and Sykehouse. Large scale canalisation of key rivers and extensive drainage systems were introduced from the 17th century, resulting in the many dykes and drains, with associated bridges, pumphouses and sluices. Late 19th and 20th century airfields, water towers, power stations and windfarms are now features of the landscape.

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

9.2 Designated historic assets
This NCA has the following historic designations:
- 1 Registered Parks and Gardens covering 68 ha
- 1 Registered Battlefield/s covering 622 ha
- 91 Scheduled Monuments
- 1,552 Listed Buildings

Source: Natural England (2010)
10. Recreation and access

10.1 Public access

- Over 3% of the NCA 5,525 ha is classified as being publically accessible.
- There are 1,357 km of Public Rights of Way at a density of 0.8 km per km².
- There is 1 National Trail within the NCA. The Trans-Pennine Trail runs north of Doncaster, past Hatfield Moor and on to Selby and Howden.

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

<table>
<thead>
<tr>
<th>Access designation</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Trust (Accessible all year)</td>
<td>0 ha</td>
<td>0%</td>
</tr>
<tr>
<td>Common Land</td>
<td>2,110 ha</td>
<td>1%</td>
</tr>
<tr>
<td>Country Parks</td>
<td>0 ha</td>
<td>0%</td>
</tr>
<tr>
<td>CROW Access Land (OC and RCL)</td>
<td>1,949 ha</td>
<td>1%</td>
</tr>
<tr>
<td>CROW Section 15</td>
<td>334 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>CROW Access Land (Section 16 Dedicated)</td>
<td>91 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Village Greens</td>
<td>62 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Doorstep Greens</td>
<td>2 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Forestry Commission Walkers Welcome Grants</td>
<td>290 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Local Nature Reserves (LNR)</td>
<td>248 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Millennium Greens</td>
<td>10 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Accessible National Nature Reserves (NNR)</td>
<td>3,221 ha</td>
<td>2%</td>
</tr>
<tr>
<td>Agri-environment Scheme Access</td>
<td>5 ha</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Woods for People</td>
<td>2,035 ha</td>
<td>1%</td>
</tr>
</tbody>
</table>

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) the highest tranquillity values are around Thorne and Hatfield Moors, along the Lower Derwent Valley, and in rural areas around Fishlake and Sykehouse and north west of Selby. Tranquillity is reduced by the presence of motorways cutting across the area, and around the urban areas of Doncaster, Thorne, Goole, Selby and Bawtry.

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

<table>
<thead>
<tr>
<th>Category of tranquillity</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Value within NCA</td>
<td>102</td>
</tr>
<tr>
<td>Lowest Value within NCA</td>
<td>-70</td>
</tr>
<tr>
<td>Mean Value within NCA</td>
<td>3</td>
</tr>
</tbody>
</table>

Sources: CPRE (2006)

More information is available at the following address: http://www.cpre.org.uk/what-we-do/countryside/tranquil-places
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 the extent to which rural landscapes are ‘intruded on’ from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. Disturbed areas are those around the towns and motorways. The figures reveal significant increases in intrusion over the past 40 years, with disturbed and urban areas both doubling in extent. A breakdown of intrusion values for this NCA are detailed in the table below.

<table>
<thead>
<tr>
<th>Category of intrusion</th>
<th>1960s (%)</th>
<th>1990s (%)</th>
<th>2007 (%)</th>
<th>% change (1960s-2007)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disturbed</td>
<td>25%</td>
<td>48%</td>
<td>53%</td>
<td>28%</td>
</tr>
<tr>
<td>Undisturbed</td>
<td>72%</td>
<td>49%</td>
<td>43%</td>
<td>-19%</td>
</tr>
<tr>
<td>Urban</td>
<td>2%</td>
<td>2%</td>
<td>4%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are the doubling of the disturbed areas, arising from the M62, airport and other developments, and the increase in urban areas.

12 Data sources

National
- Joint Character Area GIS boundaries, Natural England (data created 2001)
- National Parks and AONBs GIS boundaries, Natural England (2006)
- Countryside Quality Counts Draft Historic Profiles, English Heritage (2004)*
- BAP Priority Habitats GIS data, Natural England (March 2011)
- Special Areas of Conservation data, Natural England (data accessed in March 2011)
- Special Protection Areas data, Natural England (data accessed in March 2011)
- Ramsar sites data, Natural England (data accessed in March 2011)
- Sites of Special Scientific Interest, Natural England (data accessed in March 2011)
- Source protection zones, Environment Agency (2005)
- 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.
Recent changes and trends

Trees and woodlands
- From 1999 to 2003 there was an increase in uptake of Woodland Management Grants and improved management of existing blocks, with about 20% of the woodland cover managed through a Woodland Grant Scheme.

Boundary features
- Field boundaries are generally ditches and dykes in the central low-lying areas, with hedges on slightly higher land to the north and south.

Agriculture
- Intensive cropping of arable and root crops continues, but with a decline in mixed farming and general cropping since 2000, and a move towards more diverse crops such as flax, borage and maize. There has also been a reduction in root crops, probably linked to the closure of the sugar beet factory near York.
- The size of holdings remains high, with 26% over 100 ha accounting for 72% of the farmed area, while small farm holdings (under 5 ha) have reduced in number.
- Livestock numbers remain relatively low, with a more substantial decline (44%) in pig numbers from 237,885 in 2000 to 133,798 in 2009.

Settlement and development
- There has been continued pressure on the rural character of the area as a result of growth pressures, with housing, transport infrastructure and industry expanding, in particular around Doncaster.
- Other recent developments include warehousing adjacent to motorway junctions, large agricultural buildings in rural areas, and transport infrastructure and industry related to the airport near Rossington. There has been a recent increase of the number of windfarms constructed in the area.

Semi-natural habitat
- The productive agriculture has continued to limit the network of semi-natural habitats. There are instances where the lowering of the water table as a result of drainage and pumping to abstract water for consumption and summer irrigation is causing the drying out of peat bogs and water dependent habitats.
- The Wetland Vision initiative has invested in habitat restoration and creation over recent years, and agri-environment schemes have targeted wetland creation, so the results of these initiatives should become evident in the near future.
Historic features

- The Heritage at Risk register indicates that there are currently 70 designated monuments at risk in this NCA. However, the historic field patterns, especially the open strip fields on the Isle of Axholme, remain vulnerable to amalgamation.

Coast and rivers

- Since 2007 the Water Framework Directive has monitored the ecological status of waterbodies, and the majority of surface water within this NCA is of moderate or poor quality. Rivers in the middle of the area are generally of good chemical status, although several other rivers in the north and south are failing to achieve good chemical status.
- The majority of groundwater sources are of poor chemical status. The Sherwood aquifer underlies part of the area to the south and west, and here abstraction levels are above those needed to achieve ‘good status’ in line with the Water Framework Directive, and deterioration of this resource may result from the continuation of over-abstraction and nutrient inputs.

Minerals

- Commercial peat cutting has now ceased on Thorne and Hatfield Moors, but elsewhere, and in particular in the south, extraction of sand and gravel deposits still occurs.

Drivers, future challenges and opportunities

Climate change

**Climate change is likely to result in:**

- Summer droughts leading to increased water demands in particular on groundwater supplies, resulting in greater pressure on the Sherwood Sandstone Aquifer and a possible increase in farm reservoirs.
- Hotter drier summers may lead to drying out of peat, of wetland habitats and ditches and increased incidence / severity of wildfires, and also could increase stress on small or isolated habitats, in particular wetland habitats, ditches, lowland raised mires and floodplain grazing marshes, and a tendency towards eutrophication in dykes and canals.
- A longer growing season potentially leading to double cropping, and a warmer climate leading to new crops.
- Wetter winters and more storm events may lead to increased frequency and magnitude of flooding in the lower catchment reaches, with the risk of over-topping defences, with consequent risk of poor water quality inundation and salinisation of quality agricultural land.
- Increased intensity of rainfall will also result in an increase in sediment loads and nutrient run-off from agricultural land into ditches, canals and rivers, and erosion of peat soils.
- Increased flood water flows will impact on the vulnerable lower reaches of many of the rivers, such as the lower Derwent, which will require improvements and management upstream to mitigate the effects.
- Increases in frequency of flooding and increased depth and speed of flood waters, especially on the Aire and Don catchments, will need additional washlands and flood storage, with the possibility of creating more permanent grassland and other semi-natural habitats.
Rising sea levels will put pressure on existing flood defences, which can lead to higher or more robust tidal defences being built, or opening up opportunities for more managed realignment and flood storage schemes, which could include creation of wetland habitats.

Future opportunities

Opportunities will arise to incorporate green infrastructure networks in new development, and to deliver high standards of sustainable design, for example in the areas around Thorne, Moorends, Stainforth, Hatfield, Armthorpe and Rossington, as well as in the principal towns of Doncaster, Selby and Goole.

Doncaster may develop as a nationally significant transport centre, with its proximity to motorways, the airport, the Humber and mainline rail, while there is likely to be significant development associated with Rossington as an inland rail port, with road and airport expansion, warehousing and housing.

There is likely to be an increase in traffic associated with the Doncaster – York and Doncaster – Immingham strategic transport corridors which pass through the area.

There may be an increase in water-borne freight along the navigable waterways which serve the Humber ports in the adjacent Humber Estuary NCA.

The extension of flood storage sites along the Aire and Don, along with new flood storage areas near Goole and Flixborough Grange, will open up opportunities for the creation of new wetland habitats.

There may be an increase in the number of small reservoirs on farms, built to increase water supply for irrigation in the summer.

Continued demand for sand and gravel may lead to further extraction, with opportunities for restoring existing and future sites so that they make a positive contribution to local landscape character and biodiversity.

The continuation of inappropriate cultivation practices on peaty soils will result in oxidation and erosion, causing lowering of soil levels and thus increasing the risk of flooding, along with a reduction in agricultural productivity, soil quality and sediment run-off.

The NCA is administered by five local authorities; Selby, Doncaster, East Riding of Yorkshire, North Lincolnshire and Bassetlaw, and thus whilst many of its systems and functions are connected, the area lacks a coherent approach to some resource management and land use issues.

Working and restored canals and paths alongside dykes will continue to provide attractive foci for recreational use, but lack of funding may limit the opportunities for further restoration and management.

There is likely to be a continued demand for renewable energy generation, which could result in further onshore wind turbines, new structures at the existing power station complexes, and the establishment of biomass crops, including Miscanthus and short rotation coppice.

The Levels are one of the most productive agricultural areas in England, with large rectangular fields often bounded by ditches.
Supporting Document 3: Analysis supporting Statements of Environmental Opportunity

The following analysis shows the projected impact of Statement of Environmental Opportunity on Ecosystem Service Provision:

<table>
<thead>
<tr>
<th>Statement of Environmental Opportunity</th>
<th>Food Provision</th>
<th>Timber Provision</th>
<th>Water Availability</th>
<th>Genetic Diversity</th>
<th>Biomass Energy</th>
<th>Regulating Climate Change</th>
<th>Regulating Water Quality</th>
<th>Regulating Water Quantity</th>
<th>Regulating Soil Quality</th>
<th>Regulating Soil Erosion</th>
<th>Pollination</th>
<th>Pest Regulation</th>
<th>Regulating Coastal Erosion</th>
<th>Recreational Opportunity</th>
<th>Inspiration/Sense of Place</th>
<th>Biodiversity</th>
<th>Goodwood</th>
<th>Tranquility</th>
<th>Sense of History</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Safeguard, manage and expand the wetland habitats, including the internationally important lowland raised bogs, the floodplain grazing marsh, reedbeds, wet pastures and watercourses, to protect and enhance biodiversity, contribute to landscape character, address climate change and reduce flood risks.</td>
<td>↓</td>
<td>← ←</td>
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<tr>
<td>2. Manage the agricultural landscape to retain its distinctive character and its productivity, whilst improving its contribution to biodiversity, the protection of vulnerable soils and palaeo-environmental evidence and the water resource.</td>
<td>↑</td>
<td>← ←</td>
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<tr>
<td>3. Manage the landscape features such as semi-natural habitats and historic field patterns that reveal local variations in landscape character, often arising from underlying soils and history of drainage, to enhance people’s understanding and enjoyment of the landscape.</td>
<td>← ←</td>
<td>← ←</td>
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<tr>
<td>4. Protect the open and expansive character of the landscape, its cultural features and sense of remoteness, by ensuring that new development is sensitively located, accommodates green infrastructure, retains long views and makes a positive contribution to biodiversity.</td>
<td>← ←</td>
<td>← ←</td>
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</tbody>
</table>

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

=National Importance; =Regional Importance; =Local Importance
### Landscape attributes

<table>
<thead>
<tr>
<th>Landscape attribute</th>
<th>Justification for selection</th>
</tr>
</thead>
</table>
| Low-lying, flat, large scale productive arable landscape with large geometric fields divided by ditches and dykes; central areas generally without trees or hedges. | - These features mark the area out as distinctive from adjacent cultivated areas. The open, treeless but productive landscape reveals the relatively recently reclamation of the land from marsh.  
  - 43% of the land is classified Grade 1 or 2 Agricultural Land.  
  - The network of ditches make a significant contribution to the landscape character, as well as providing important wetland habitats with potential for improved connectivity. |
| Variations in underlying drift deposits give rise to a mix of soils and habitats, notably lowland raised bogs of international significance, sandy deposits giving rise to heathland, and heavier clays giving rise to pastoral landscapes. | - Past management has responded to the underlying soil and drainage conditions, resulting in subtle variations in landscape character.  
  - Sandy infertile soils are revealed by areas of conifer plantations and heathland (as at Strensall Common), and bracken in the road verges; Skipwith Common is a National Nature Reserve and is designated SAC.  
  - The lowland bogs have developed their own specialised plant and animal communities, with two large areas, Thorne and Hatfield Moors are of international significance (SAC, SPA) and designated National Nature Reserves.  
  - Heavier soils give rise to more pastoral landscape around Fishlake and Sykehouse, with small fields bounded by hedges, narrow lanes and ponds. |
| Widespread evidence of reclamation and drainage history with an extensive network of ditches, dykes, canals and rivers, with flood banks, bridges, pumping stations and evidence of old river courses. | - 7 canals cross the area in addition to the many navigable rivers.  
  - 91 scheduled monuments include several moated sites, and there are 1,552 listed buildings.  
  - Strong network of ditches, dykes and canals are visually very obvious, and also provide opportunities for access to quiet stretches as well as viewing the historic features themselves. |
| Important historic landscapes, most notably the Isle of Axholme with its medieval open strip fields, linked to surrounding turbaries and marshes; warps near Goole; cables near Thorne and Goole; medieval open fields and flood meadows along the Lower Derwent valley. | - English Heritage describes the Isle of Axholme as ‘a special landscape of medieval origin. This is the largest and most varied survival of open field strip cultivation in the country, characterised by nucleated settlements, extensive areas of narrow hedgeless cultivated strips or ‘lands’ often arranged in a contrasting patchwork of differently aligned groups or furlongs. Associated with the strip field landscapes are areas of peat moor enclosed from the medieval period onwards’.  
  - Cable field patterns similarly reveal earlier practices in cultivation.  
  - Warps reveal the connection between the farmed land and its reclamation from the rivers and marshes, and use of ‘warping’ (periodic flooding) to bring sediments in to enrich the farmland. |
| Lowland raised bogs at Thorne and Hatfield Moors, create distinctive wetlands with some woodland, with a strong sense of remoteness and wildness. | - The lowland raised bogs are of international significance, with Thorne & Hatfield Moors designated as National Nature Reserves, SPAs and SACs. |
Important and distinctive wetlands associated with watercourses, including flood meadows, fens and wet woodlands, and intertidal habitats along the Humber estuary.

- Lower Derwent valley is designated as a Special Protection Area for its birdlife, a Special Area of Conservation for its biodiversity, and is a Ramsar site for its value overall as a wetland; it is also a National Nature Reserve. It is a distinctive riverine landscape, with extensive medieval open field patterns. Thorne & Hatfield Moors comprise rich combinations of wetland habitats, also designated SPA and SAC.
- The designations of SPA and SAC covering the Humber Estuary reach up into this NCA; the estuary is also a Ramsar site.
- Extensive networks of ditches and dykes to drain the area now form important connecting links between wetland habitats, as well as significant habitats and landscape features in themselves.

Clear settlement pattern with small villages and large farms on slightly higher drier land; large settlements of Doncaster, Goole, Selby and Bawtry.

- Clear and visible connection between drainage and settlement patterns over time.

Waterlogged soils hold internationally significant palaeo-archaeological deposits.

- An extensive example of well preserved organic remains dating from the Iron Age have been uncovered at Sutton Common.
- Intact palaeo-environmental evidence of occupation through time remains under the meadows along the Pocklington canal, for example at Grange Ings.

Long views to distant horizons, with big expansive skies; the more robust semi-natural habitats provide good opportunities for accessing and enjoying the lowland landscape, and raised flood defences provide slight elevations to provide walkers with extensive views across the flat landscape.

- Although a relatively low density of footpaths, those routes that do exist, including elevated flood banks alongside watercourses and canal towpaths, provide good views and experiences of remote and rural countryside.
- The Trans Pennine trail crosses the area and the Peatlands Way provide access opportunities near Doncaster.
- The Humberhead Peatlands NNR is a flagship reserve for public access, education and enjoyment.
Landscape opportunities

- Protect the open character of the landscape with its long and expansive views, big skies.
- Protect areas with a strong sense of remoteness, ‘wildness’ and tranquillity, including Thorne and Hatfield Moors, lower Derwent valley, and lowland heaths.
- Manage and expand wetland habitats, including wet pastures, fens, reedbeds and, where appropriate, wet woodland.
- Protect palaeo-archaeological evidence, especially within peaty soils, and the widespread artefacts and evidence of drainage history.
- Seek opportunities to interpret the particular landscape character and history, and provide opportunities for more people to understand and enjoy the landscape.
- Conserve the high quality and productive soils for continued agricultural production whilst ensuring that the agricultural landscapes make a greater contribution to wildlife, especially farmland birds, avoiding or reducing cultivation where there are archaeological features.
- Ensure that the important network of ditches is managed to encourage emergent vegetation thus forming important landscape features and wildlife corridors.
- Manage the water table levels so that existing wetland habitats are protected and opportunities to extend them or create buffering pastures can be developed.
- Conserve and interpret the important historic landscapes, especially the Isle of Axholme, the Lower Derwent Valley and Thorne and Hatfield Moors, and the distinctive differences in historic management including warps, cables and turbaryes, and the pastoral landscape around Fishlake and Sykehouse.
- Conserve, manage and expand semi-natural habitats that reveal the influence of underlying soils and hydrological conditions, especially lowland heath, lowland raised bogs, wet woodlands, birch / oak woodlands, fens, intertidal and saline habitats.
- Ensure that managed realignment sites, new flood storage areas or where flood defences are allowed to occasionally over-top, are managed to create wetland habitats including wet pastures that contribute both to landscape character and biodiversity.
- Ensure a high level of design so that any new or reinforced flood defences, or new irrigation reservoirs, are constructed with minimal adverse impact on the landscape, and provide new habitat creation opportunities where possible.
- Protect the open character of the landscape with its long and expansive views, big skies.
- Ensure that managed realignment sites, new flood storage areas or where flood defences are allowed to occasionally over-top, are managed to create wetland habitats including wet pastures that contribute both to landscape character and biodiversity.
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 analysis and opportunities may change upon publication of further evidence and better understanding of the inter-relationship between services at a local level.

<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
<th>Main beneficiary</th>
<th>State</th>
<th>Analysis</th>
<th>Opportunities</th>
<th>Principle services offered by opportunities</th>
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</table>
| Food Provision  | Cultivation of cereals and other arable crops | National         | Fertile soils, with 10% of the land classified as Grade 1, 33% as Grade 2, and a further 41% classified as Grade 3.¹ | To retain the current levels of productivity, need to ensure that soils remain fertile; peaty soils in particular are vulnerable to desiccation and erosion. Also water table level management and availability of water for irrigation, especially in the summer, need to be addressed. The generally high levels of nutrient input can lead to issues around nutrient run-off into ditches and wetlands. Some soils, especially peaty ones, are prone to erosion and oxidation if intensively cultivated; different cultivation practices or crop selection could reduce these impacts. Wildfowling, and to a lesser extent fishing, are local activities providing food. | Encourage sustainable land management practices such as over-wintering stubble, to avoid leaving peaty soils exposed. Encourage the introduction of break crops or fallow into rotations, to improve soil structure and organic content especially on sandy soils, and to improve resistance to erosion on peaty soils. Consider the selection of crops to reduce impacts on soils. Maintain wetland and riparian habitats and water quality to enable continued fishing and wildfowling. | Food provision  
Soil quality  
Regulating soil erosion  
Water quality  
Climate change mitigation |
| Timber Provision| Existing woodland cover                        | Local            | Existing woodland covers just 4% of the area, and is limited to small scattered woodlands, with some blocks of conifers in the south | There is limited potential for increasing the timber production in this area by bringing all existing woodlands under management to increase their productivity. The scope for new woodland is limited, as the predominant land use is agriculture | Ensure that existing woodlands are under management to produce timber, primarily for local use | Timber provision  
Soil erosion  
Soil quality  
Climate change mitigation |

¹ Agricultural Land Classification 1:250,000 Map, Defra (2002)
### Service | Assets/attributes: main contributors to service | Main beneficiary | State | Analysis | Opportunities | Principle services offered by opportunities
--- | --- | --- | --- | --- | --- | ---
**Biomass** | Existing woodland cover | Local | The existing woodland cover (4%) offers only limited potential for the provision of biomass through bringing unmanaged woodland under management. The straw produced from the extensive cereal cropping could be considered as a source of biomass. | Local power stations, including Drax, are all exploring ways of achieving more energy production through use of renewable biomass sources, and their decisions may impact on the crops grown in close proximity. There is a medium potential yield for Short Rotation Coppice, and high potential yields for Miscanthus throughout the NCA.² | Encourage the establishment of biomass crops including Miscanthus and short rotation coppiced willow, locating them on the less fertile soils (to reduce impact on agricultural production), and avoiding any adverse impacts on long views or historic landscapes. | Climate change mitigation  
Carbon sequestration  
Timber provision

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2 Defra’s Opportunities and optimum sitings for energy crops within the Yorkshire and Humber region [http://archive.defra.gov.uk/foodfarm/growing/crops/industrial/energy/opportunities/yh.htm](http://archive.defra.gov.uk/foodfarm/growing/crops/industrial/energy/opportunities/yh.htm)

3 Ibid
## 39. Humberhead Levels

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<tbody>
<tr>
<td>Water Availability</td>
<td>Major river systems including Ouse, Trent, Aire, Derwent, Don, Idle, Torne and Went. Sherwood Sandstone Aquifer underlies western half of the area.</td>
<td>Regional</td>
<td>The western half of the NCA overlays the major Sherwood Sandstone aquifer, which provides a strategically important source of public water supply, as well as industrial and agricultural abstractions. Surface water sources are over abstracted in the southern half of the NCA. The rivers Torne and Idle in the south of the NCA are over-abstracted, and the Environment Agency aims to reduce actual abstraction from both surface and groundwater sources. There is no water available along the River Don, while the only resource available for additional abstraction is the River Foulness in the northeast, although this will be downgraded to ‘no water available’ by 2015 if there is shown to be demand for abstraction.</td>
<td>The whole of the Sherwood Sandstone aquifer is currently over licensed and is expected to remain over-licensed to at least 2015. There is no groundwater available for abstraction within the Selby area, as groundwater levels have dropped below sea level. Thus the replenishing of the Sherwood Aquifer needs to be addressed, as does the issue of potential salination of groundwater supplies. Further abstractions would risk the availability of water to existing license holders and may lead to the introduction of saline water, and therefore are to be prohibited. Throughout the aquifer, abstractions will only be allowed where groundwater levels are above sea level.</td>
<td>Seek opportunities to increase areas of semi-natural habitats, especially grassland, to improve water infiltration. Encourage the restoration of peat bogs to increase their capacity to store water. Work with Internal Drainage Boards and land owners/managers to manage watercourses and allow water table levels to rise where appropriate. Ensure that new irrigation reservoirs are assimilated into the local landscape, and are designed to contribute to biodiversity where possible. Adopt agricultural practices on sandy soils to build up a good soil structure and increase the organic matter content to improve permeability.</td>
<td>Water quality, Food provision, Soil quality, Carbon sequestration</td>
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| Genetic diversity | No information provided as not considered to be commercially important in this NCA |

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### Analysis of Regulating Services

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<tr>
<td><strong>Climate Regulation</strong></td>
<td>Peat and peaty organic soils Wetlands Woodland cover</td>
<td>Regional</td>
<td></td>
<td>Significant carbon regulation is offered by the peat and peaty soils (30%) with their high carbon content soils. The wetlands, including floodplain grazing marsh, reedbeds and fens (5%), also contribute. The relatively low woodland cover (4%) makes a limited contribution.</td>
<td>Peat and peaty soils should be managed so that they are actively sequestering and storing carbon. Peaty soils under cultivation are highly vulnerable to oxidation, as well as wind and water erosion; cultivation practices should avoid leaving them exposed. Such soils can be protected by keeping the water table levels high and managing as permanent grassland. The carbon content of mineral soils can be increased under permanent grassland and managed on an extensive regime that reduces or excludes the use of artificial fertilisers. Woodlands can be managed to increase their productivity, thus improving their efficacy in carbon sequestration. The natural regeneration of woodlands on wet peaty soils would effectively capture carbon.</td>
<td>Maintain lowland bogs and peaty soils in favourable condition. Encourage the natural regeneration of wet woodland on peaty soils where appropriate. Adopt agricultural practices that do not require ploughing, or that reduce the frequency of ploughing, such as including fallow in rotations, and avoid soils being left exposed by, for instance, retaining stubble over-winter. Increase the area of permanent grassland and other semi-natural habitats, and manage them on a low-input basis. Improve management of existing woodlands.</td>
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<td><strong>Regulation of Soil Erosion</strong></td>
<td>Loamy and clayey soils Peat and peaty soils (8%) Sandy soils (30%)</td>
<td>National</td>
<td></td>
<td>Just over half of the NCA has soils that are at low risk of soil erosion, covering the slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils, loamy and clayey soils of coastal flats with naturally high groundwater, and the loamy and clayey floodplain soils with naturally high groundwater. In addition, the loamy soils with naturally high groundwater are at low risk of erosion except where coarser textured variants occur on sloping or uneven ground. Deep peat and peaty soils cover some 8% of the area, and where cultivated are vulnerable to wind and water erosion and oxidation. Sandy soils cover 30% of the area.</td>
<td>Responses need to be different to respond to the two main concerns with soil erosion in this NCA. Peat and peaty soils are at risk of both wind and water erosion when left bare, and of loss through shrinkage and oxidation. The free draining sandy soils are light textured and prone to erosion on sloping ground where cultivated land is left bare, and especially when organic matter levels are low following continuous cultivation or compaction. There is also widespread potential for erosion of sandy soils from rapid run-off during storm events or where compacted. Oxidation of peaty soils and erosion of all soils needs to be addressed here, as the soils underpin the importance of the area for food provision.</td>
<td>Ensure that on peaty soils agricultural practices encourage minimum cultivation and avoid leaving surfaces exposed, for example by introducing fallow into rotations, over-wintering stubble, or reversion to permanent grassland. Encourage agricultural practices that retain cover and build up organic matter especially on free draining sandy soils</td>
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### 39. Humberhead Levels

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| **Regulation of Soil Quality** | Wide range of soil types                          | Regional          | This NCA has 13 main soilscape types: Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (24%). Loamy and clayey soils of coastal flats with naturally high groundwater (22%). Naturally wet very acid sandy and loamy soils (14%). Freely draining slightly acid sandy soils (11%). Loamy soils with naturally high groundwater (8%). Loamy and clayey floodplain soils with naturally high groundwater (6%). Loamy and sandy soils with naturally high groundwater and a peaty surface (4%). Fen peat soils (2%). Raised bog peat soils (2%). Freely draining slightly acid loamy soils (2%). Freely draining lime-rich loamy soils (1%). Slightly acid loamy and clayey soils with impeded drainage (1%). Freely draining very acid sandy and loamy soils (1%). | The slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils may suffer compaction and / or capping as they are easily damaged when wet. This may lead to increasingly poor water infiltration and diffuse pollution as a result of surface water run-off. Management measures that increase organic matter levels can help reduce these problems. The loamy and clayey soils of coastal flats with naturally high groundwater (22%) have a high agricultural potential but this is dependent on the continued ability to pump drain and protect the soils from sea flooding / saline intrusion. With continued abstraction, locally some soils are at risk of becoming saline; these soils are also vulnerable to sea level rise. Where there is a high silt / fine sand content, compaction and / or capping may be an issue which can be reduced by increasing soil organic matter content. The freely draining slightly acid sandy soils (11%) have potential for increasing organic matter levels by management interventions, which would also help to minimise erosion risk. The quality of the more fertile soils here needs to be maintained, as it underpins the importance of the area for significant food production. | Encourage agricultural practices that build up organic matter, especially on the free draining sandy soils. Ensure that agricultural practices do not further deplete peaty soils, for instance, by avoiding leaving surfaces bare and thus vulnerable to drying out and oxidation. | Climate regulation
Regulation of soil erosion |
### 39. Humberhead Levels

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<tr>
<td>Regulation of Water Quality</td>
<td>Sherwood Aquifer in western part Groundwater Major rivers and dykes</td>
<td>Regional</td>
<td>The quality of the lower stretches of the major rivers is largely determined by inputs and land management activities further upstream.</td>
<td>The aquifer, other groundwater sources and all the watercourses are vulnerable to nutrient pollution. With the predominance of arable cropping in this area, it is essential to ensure that nutrient inputs are matched to needs. The rivers form important corridors for migrating salmonids, so good water quality and lack of barriers are essential to enable this movement of species.</td>
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<td></td>
<td>Encourage arable reversion and the establishment of permanent grassland, especially alongside watercourses, with low input management, to reduce nutrient run-off and aid water infiltration. Encourage management of farmland under principles established under the Catchment Sensitive Farming Delivery initiative. Adopt management that encourages emergent vegetation along ditches, and introduce reedbeds and other wetland habitats, that help to filter water.</td>
<td>Regulating soil erosion Regulating soil quality Food provision Biodiversity</td>
</tr>
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<tr>
<td>Regulating Water (river flooding)</td>
<td>Lower stretches of major rivers including Ouse, Aire, Derwent, Don, Idle, Torne and Went, as well as the River Humber into which they all flow</td>
<td>Regional</td>
<td>This NCA encompasses the open, flat plain that is dominated by the major river systems of the Aire, Ouse and Trent, which flow from surrounding higher ground south, north and east into the Humber estuary. Some land is now close to sea-level and is maintained as agricultural land by pumping. Most stretches of the rivers are contained between flood banks to prevent flooding of adjacent land.</td>
<td>The majority of the NCA is at risk from fluvial flooding, exacerbated by combinations of high rainfall within the extensive catchments of the rivers with high tides and rising sea level. The major flood risk in the Aire and Don catchments arise through an increased frequency of flooding and greater depth and speed of flood water, which can be mitigated by further washlands and additional flood storage. Settlements at risk include Doncaster, Goole and Selby. The Lower Derwent valley is vulnerable to increased flood water flows, which can be mitigated by changes in management upstream, including improvements to floodbanks and washlands. Drainage from development can be managed by reducing new developments within flood risk areas. Sites suitable for allowing occasional over-topping of flood defences will also need to be identified.</td>
<td>Work with key partners and landowners to identify suitable sites for flood storage and occasional over-topping of flood defences. Optimise design and implementation of future flood storage areas to create new wetland habitats, such as floodplain grazing marsh, and creating links with existing semi-natural habitats. Manage water bodies, including ditches, to increase structural diversity which will help to retain winter floodwater for longer and provide refuges for species vulnerable to inundation events. Encourage agricultural practices that build up organic matter and reduce the risk of soil compaction and thus improving water infiltration. Restore and expand wetland habitats on floodplains, including wet pastures, reedbeds, traditionally grazed alluvial flood meadows, to attenuate flood flows. Find ways of assimilating new or reinforced flood defences into local landscapes with minimum visual impact and disruption to existing habitats or species movement. Adopt strategic approaches to increasing the capacity of catchments to retain water, including addressing river management upstream to reduce impacts on landscapes downstream, notably the vulnerable floodplain of the Lower Derwent Valley. Allow watercourses to revert to natural, dynamic courses where possible, thus allowing the energy of the water flow to dissipate.</td>
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<tbody>
<tr>
<td>Regulation of coastal flooding</td>
<td>Upper reaches of Humber estuary</td>
<td>Regional</td>
<td>Much of the NCA is at risk from coastal flooding. The protection of the area depends upon flood defences along the Humber, which in places are at risk of overtopping. Over 36,000 properties are at risk, including land in the floodplains, in particular of the rivers Ouse and Aire, and the whole of the town of Goole. To protect these properties, the lower reaches of the River Trent and the River Ouse, and the Humber are confined by flood defences.</td>
<td>The risk of coastal flooding is exacerbated by combinations of high rainfall within the extensive river catchments flowing down to meet high tides and increases in sea level, which in turn are exacerbated by low atmospheric pressure and on-shore winds. Future plans include maintaining the flood defences, eg. around Goole, but accepting occasional overtopping of defences, eg. from Brough Haven to Weighton Lock; Faxfleet to Saltmarshe; Goole Fields and Crowle. Possible sites for increasing flood storage are under consideration near Goole and Flixborough Grange.12 Allowing the development of intertidal habitats such as reedbeds and salt marsh are an effective way of dissipating wave energy and thus providing coastal flood defence, and reducing the costs of maintenance of flood banks. Thus managed realignment schemes are a cost effective flood defence strategy, in addition to proving new intertidal habitat which enhance biodiversity.</td>
<td>Seek opportunities to expand inter-tidal habitats along the Humber to offset coastal squeeze. Seek opportunities for managed realignment of the estuary banks, to increase the capacity of the estuary to hold flood waters, and restoring suites of inter-tidal and wetland habitats in the process. Measure, monitor and record elements of the historic environment to enable a prioritised response to rising sea levels and increased inundation events.</td>
<td>Biodiversity Sense of place Sense of history</td>
</tr>
<tr>
<td>Pollination</td>
<td>Semi-natural habitats</td>
<td>Local</td>
<td>Limited extent of semi-natural habitats throughout the area, with substantial blocks of raised bog and lowland heath. With extensive areas of cereal and general cropping, there are limited sites currently supporting pollinating insects. Floodbanks contain most of the main rivers, and could provide pollinating support if the sward comprised a greater range of flowering species.</td>
<td></td>
<td>Seek opportunities to introduce species rich grassland, pollen and nectar strips, margins along arable field edges and alongside watercourses within the agricultural landscape, to encourage and support pollinating insects. Seek opportunities to create species rich grassland on floodbanks.</td>
<td>Biodiversity Sense of place Food provision</td>
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## Analysis of cultural services

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<tbody>
<tr>
<td><strong>A sense of place/ Inspiring Places</strong></td>
<td>Open, large scale low-lying intensively farmed landscape, with extensive network of ditches and dykes Variation introduced by slight changes in soils and elevation Long views, big skies</td>
<td>Regional</td>
<td>A sense of place is created by the generally flat, low-lying intensively farmed landscape, divided by ditches into large regular fields, with variation introduced by slight changes in soils and elevation, giving rise to lowland heathlands and raised bogs. The watercourses form a key part of the landscape, with the extensive network of ditches and dykes, large rivers contained within floodbanks, and wide river floodplains. 13</td>
<td>This is a distinctive large scale open landscape, dominated by agriculture, providing striking contrasts to the upland landscapes of the region. Its general lack of hedges, long views and openness create a strong sense of place.</td>
<td>Retain long views and the experience of big skies. Ensure that the network of ditches and dykes are managed so that they contribute visually to the landscape, by encouraging emergent vegetation, and thus also provide effective linking habitats with diverse vegetation and wildlife. Adopt cultivation practices that will ensure the long term sustainability of agriculture. Seek opportunities to bring attention to the rivers and their role of water in shaping the landscape, especially where rivers are concealed behind flood defences. Retain the contrasts with the local differences in landscape character, notably the more enclosed pastoral landscape north of Doncaster, and the wild and remote feel to the lowland bogs and heaths and the lower Derwent valley. Protect and enhance the biodiversity interest, so that more people can enjoy the sights of overwintering birds, of water voles, marsh harriers, nightjars and bitterns, dragonflies and butterflies, and all the plant and animal communities associated with the important semi-natural habitats.</td>
<td><strong>Food provision</strong> <strong>Biodiversity</strong> <strong>Water quality</strong> <strong>Water regulation (river flooding)</strong></td>
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13 Countryside Commission, Countryside Character Vol. 3 Yorkshire & the Humber, 1998
### 39. Humberhead Levels

#### National Character

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<tbody>
<tr>
<td>A sense of history</td>
<td>Artefacts associated with drainage history Areas of distinct field patterns eg. warps, cables Isle of Axholme medieval open strip fields</td>
<td>National</td>
<td>A sense of history is revealed through all the many features associated with the reclamation and control of the drainage of the area, such as dykes, floodbanks, berms, bridges, canals, pumping stations, disused windmills, water towers and old river courses. The watercourses and canals were also important communications and trading routes linking the industry inland with the North Sea and Europe. More recently, the several power stations reflect the close links between the plentiful water supply and underlying coal supplies. The historic landscape character is further reinforced by the contrasts between the large rectilinear fields of relatively recent reclamation, and more intimate areas such as the enclosed pastoral landscape around Fishlake and Sykehouse. Also there are strong field patterns notably the remnant medieval open field patterns of the Isle of Axholme, the cables near Goole and the warps near Thorne. The landscape at Haxey and Epworth Turbaries also reveals past practices of peat cutting, while the Lower Derwent valley still maintains some of the medieval strip field meadow system.</td>
<td>The distinctive field patterns are of note, and can be retained through sympathetic farming practices. The open strip fields on the Isle of Axholme are particularly vulnerable to amalgamation. Palaeo-environmental evidence is vulnerable to drying out of peaty soils through continued or increased pumping and cultivation.</td>
<td>Protect the evidence of different histories of land management, land use and settlement, including field patterns, turbaries. Protect the internationally significant historic landscape of the Isle of Axholme and its setting. Protect palaeo-archaeological evidence by maintaining and managing water table levels, and protect historic field features, including ridge and furrow, through appropriate land management, eg. arable reversion to permanent pasture. Protect and interpret the history of the area, in particular that of its drainage history, and the significance of the Humber in linking hinterland with north west Europe. Encourage use of local building materials in new build, and ensure appropriate materials and styles are used in restoration of traditional vernacular buildings.</td>
<td>Sense of history Sense of place Water quality Regulation of soil erosion Soil quality Recreation</td>
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14 JCA statements of historic interest, English Heritage, 2007 (unpublished)
A sense of tranquillity

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<tbody>
<tr>
<td>A sense of tranquility</td>
<td>Pockets of tranquillity around Thorne and Hatfield Moors, Lower Derwent valley</td>
<td>Local</td>
<td>The area has experienced a significant decline in tranquillity since the 1960s. Undisturbed areas have decreased from 72% in the 1960's to 43% in 2007. Remaining areas of tranquillity are concentrated around Thorne and Hatfield Moors and the Lower Derwent valley.</td>
<td>The extensive bogs of Thorne and Hatfield Moors provide a particularly strong sense of remoteness and ‘wildness’, as do the smaller scale riverine landscape of pasture, flood meadows and small woodlands along the Lower Derwent, and to a lesser extent the pastoral landscapes around Fishlake and Sykehouse.</td>
<td>Protect those areas with a strong sense of remoteness and ‘wildness’, notably Thorne and Hatfield Moors and the Lower Derwent Valley, from further intrusion and development, including unnecessary night lighting.</td>
<td>Sense of tranquillity, escapism, recreation Sense of place, inspiration</td>
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Recreation

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<th>Opportunities</th>
<th>Principle Services Offered by Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreation</td>
<td>Paths along floodbanks Thorne &amp; Hatfield Moors National Nature Reserves</td>
<td>Local</td>
<td>The NCA offers a network of rights of way totalling 1,357km at a relatively low density of 0.8km per km² and open access land covering 1,949 ha or just over 1% of the NCA.</td>
<td>Particular recreational opportunities are associated with paths alongside canals and along floodbanks, which offer elevated views out over the flat landscape, and the Trans Pennine Trail and the Peatlands Way around Doncaster. Thorne &amp; Hatfield Moors NNRs are flagship reserves for access and enjoyment of their special qualities. Angling and wildfowling are popular and long established activities in the area.</td>
<td>Seek opportunities to provide links to the existing rights of way network. Develop Thorne and Hatfield Moors as flagship National Nature Reserves for access and enjoyment of their special qualities. Provide interpretation of the history, biodiversity and other aspects of the landscape in well visited locations.</td>
<td>Sense of place Sense of history</td>
</tr>
</tbody>
</table>

15 CPRE, Intrusion Map, 2007
16 See supporting data in ‘Facts & Data’, 39 Humberhead Levels, Natural England
### 39. Humberhead Levels

#### National Character

**Area profile:**

<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
<th>Main beneficiary</th>
<th>State</th>
<th>Analysis</th>
<th>Opportunities</th>
<th>Principle Services Offered by Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biodiversity</strong></td>
<td>2 Ramsar sites 3 SPAs 6 SACs 3 National Nature Reserves 40 SSSIs 577 local sites</td>
<td>National</td>
<td>5,729 ha (3%) of the area is designated Site of Special Scientific Interest, which largely overlap with European and international designations of Ramsar, Special Protection Areas and Special Areas of Conservation. Over 85% of the SSSI area is in either favourable or unfavourable recovering condition. Supporting the international and national designated sites are 577 Local Wildlife Sites of biodiversity interest which cover another 7,264 ha, or 4.2% of the area.</td>
<td>Continued or increased pumping or other abstraction of water will impact on existing sites, especially the lowland raised mires, and will limit the possibilities for expanding wetland habitats. The existing network of ditches and dykes provides an important resource for wildlife to penetrate agricultural areas and connect with other semi-natural habitats. The management of water quality is necessary to enable the migration of important salmonid species along the rivers.</td>
<td>Ensure that sites of particular biodiversity interest are protected and managed, and that surrounding areas are managed to create buffers and reduce impacts of pollutants and sediment run-off, so that the biodiversity interest is protected and enhanced. Work with groups of landowners and Internal Drainage Boards to manage water table levels to support a wider range of semi-natural habitats and permanent grassland. Increase the connectivity and permeability between semi-natural habitats, especially along the network of watercourses, making links with other semi-natural habitats, to improve habitat resilience and enable species movement.</td>
<td>Water quality Regulation of soil erosion Sense of place Recreation Water availability</td>
</tr>
</tbody>
</table>

| **Geodiversity** | 2 geological SSSIs and 1 mixed interest (Humber Estuary) 18 local geological sites | Local | The main geological interest of the area is the influence of the post-glacial Lake Humber and the laying down of deposits. Also of interest is the development of peat which now contains much palaeo-environmental evidence. The underlying coal beds were exploited from Selby until 2004. | Extraction of sand and gravel deposits has taken place in several locations. The deep coal beds were exploited from Selby until 2004. The combination of a local source of coal with plentiful water supplies in the main rivers gave rise to the construction of several large power stations. | Ensure palaeo-environmental evidence is retained and protected where possible. Ensure that sand and gravel extraction sites are restored to contribute to local landscape character and enhance biodiversity, providing improved access where possible. | Geodiversity Biodiversity Recreation |
Natural England is here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England’s traditional landscapes are safeguarded for future generations.

Catalogue Code: NE339

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40. Holderness

National Character
Area profile:

Introduction & Summary  Description  Opportunities  Key facts and data  Landscape change  Analysis

www.naturalengland.org.uk
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

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**Summary**

Holderness is a rural, low-lying, undulating plain with the broad, shallow valley of the River Hull flowing southwards through the centre towards Hull. The river eventually joins the expansive Humber Estuary where it becomes tidal, enclosed by flood banks, and drains into the North Sea.

The National Character Area (NCA) is bounded by the dip slope of the Yorkshire Wolds to the north and west, while eastwards, beyond the coastline of soft boulder clay cliffs, lies the North Sea. Rapid erosion of these cliffs is a conspicuous feature of this NCA, and forms part of an important coastal process of sediment transfer. Holderness is the single most important source of sediment in the southern North Sea: the sediment is carried south to the Humber, the Lincolnshire coast and the Wash, where it feeds beaches and through accretion helps intertidal habitats to adjust to rising sea levels.

Holderness shares an underlying chalk aquifer with the Yorkshire Wolds and is an important water resource for the area. The springs and streams flowing from the Wolds are part of the most northerly chalk streams in Britain, and they merge to form the River Hull in Holderness. The River Hull’s headwaters are designated as a Site of Special Scientific Interest (SSSI) for marginal riparian habitats. Holderness has six SSSI which provide evidence of the glacial and post-glacial history of the area. These consist of exposures in cliffs and gravel pits, and also include the remnants of bogs and meres. Hornsea Mere is a large, natural lake and is designated as an SSSI for its marginal habitats and as a Special Protection Area for populations of wintering wildfowl.

An extensive network of rivers, ditches, becks, dykes and canals drains the River Hull. The river’s flood plain, of mainly base-rich loamy and clayey soils, is important for food production, with vegetables and root crops grown in the shallow valley and arable farming taking place on higher land in the west and the south-east, near the coast. The high-quality agricultural land comprises large field patterns bounded by drainage ditches on the River Hull flood plain, and there are hedgerows on higher ground. Rare remnants of species-rich grassland occur around Hornsea and Lambwath meres, where low-lying, seasonally flooded hay fields are maintained by traditional farming practices.

Long views over the flat landscape and the relatively dispersed nature of settlement instil a sense of tranquillity, which is reinforced by sparse woodland cover and open views along the coastline. In contrast to this, there are some large caravan sites at certain points along the coast and the seaside resorts of Hornsea, Withernsea and Bridlington can be busy in the summer. Small, traditional villages are dispersed throughout the area, many of which have village greens, ponds and churches, some dating back to Norman times. Beverley is the largest inland settlement in the NCA and is distinctive for its large minster and historic expanses of open access grazing land – Beverley Westwood, Figham and Swinemoor.

Key challenges in this area include groundwater management, coastal flooding and coastal management. Ensuring a sustainable approach to flood and coastal risk management and enabling the coast to continue to provide sediment to other areas will be important considerations for the future.
Statements of Environmental Opportunity

- **SEO 1**: Conserve, manage and enhance the River Hull and associated river system with its many associated drains, dykes and streams to improve water quality and supply, sustainably address flood risk management, and enhance biodiversity and the historic environment through a strategic, landscape-scale approach.

- **SEO 2**: Work with landowners and land managers to support sustainable food production while enhancing and strengthening the network of farmland features; create and expand habitats in the farmed environment to enhance biodiversity and improve soil and water quality; strengthen resilience of habitats to climate change; and enhance landscape character.

- **SEO 3**: Allow essential coastal processes to occur, including erosion of the soft clay cliffs, while respecting policies that reduce erosion and flood risk in relation to key coastal settlements.

- **SEO 4**: Enhance people’s understanding and enjoyment of the geodiversity, historic sites, seaside character and remoteness that contribute to the varied sense of place and valuable recreational assets that the area provides.
Description

Physical and functional links to other National Character Areas

Holderness is a low-lying, broad, undulating plain with the River Hull flowing south through the centre towards Hull. Eastwards lies the North Sea with the large expanse of the Humber Estuary to the south, while to the north and west the land rises to the dip slope of the Yorkshire Wolds.

Holderness shares a coastline with the adjoining Yorkshire Wolds where the resistant, hard chalk headland of Flamborough Head provides a sheltered bay. By contrast, the Holderness coastline is dominated by a long stretch of rapidly eroding soft cliffs of glacial till. Erosion of these cliffs is part of the coastal process, whereby sediment is transferred further south into the Humber Estuary National Character Area (NCA), contributing to estuarine sediments, the creation of important intertidal habitats and reduction of flood risk in the Humber. Even further south on the Lincolnshire coast, it helps to form beaches and reduces erosion.

Holderness and the adjoining Yorkshire Wolds share a major chalk aquifer of national importance which is used extensively for private and public water supply, businesses and agriculture. It also provides much of the base flow of the River Hull and its headwaters which are located within Holderness, while the upper tributaries of the River Hull arise from calcareous springs in the Yorkshire Wolds NCA. The Hull headwaters form the most northerly chalk stream system in Britain and are designated as a Site of Special Scientific Interest (SSSI). The River Hull runs southwards through a shallow valley, dominating the western landscape of Holderness. At its southernmost end, towards Hull, it increases in salinity, becoming tidal. Other key waterbodies include the Leven Canal which stretches for 5 km between Leven and the River Hull and Tophill Low Reservoir, an important water storage area.

Eastwards along the dip slope of the Yorkshire Wolds, views are extensive in this predominantly flat, open and gently undulating plain which extends over the valley of the River Humber and runs south to Hull. The Humber Estuary is visible but with restricted views where there are flood embankments. Towards the coast, the proximity of the sea is scarcely apparent due to the low-lying cliffs. a, provide a backdrop of upland views.
Key characteristics

- A broad, gently undulating plain which is centred on the valley of the River Hull and is drained by a network of canals, ditches and canalised tributaries.

- Long views with arable farmland sloping upwards bounded by the dip slope of the Yorkshire Wolds to the north and west.

- Glacial landscape of boulder clay, gravels and alluvium over chalk with many glacial features including hummocky terrain, moraine-like ridges and kettle holes. Low, rapidly eroding coastline of soft clay cliffs.

- Sparse tree and woodland cover leading to a generally open landscape with long views, enclosed by the Wolds to the north and west.

- High-quality agricultural land used predominantly for large-scale arable cultivation and some livestock farming.

- Large field patterns bounded by drainage ditches on the River Hull flood plain, and hedgerows on higher ground.

- Highly fragmented remnants of semi-natural vegetation including carr, swamp and wet grassland and Hornsea Mere, a large, natural lake designated for its associated habitats and bird species.

- Gently undulating land towards the coastal strip, characterised by arable farmland, wind-pruned trees, holiday homes, caravan parks and some historical sites.

- Inland, the agricultural landscape is separated from the North Sea by a line of soft boulder clay cliffs with long views out to sea along a sweeping coastline with the Chalk headland of Flamborough visible in the north.

- The interaction between different currents at the Flamborough Front provides good feeding grounds for fish, birds and marine mammals.

Continued on next page...
A wide range of seabirds (such as razorbill and gannet) visible throughout inshore waters, dispersing from nesting sites further north. At certain times of the year large numbers of little gull are present at Hornsea Mere. Little tern forages along the Holderness coast.

A network of minor winding roads and lanes, linking dispersed villages and hamlets, with village churches providing prominent landmarks in the flat landscape. Many villages have a variety of buildings grouped around ponds and village greens.

The principal towns of Holderness are Driffield, Beverley and the coastal resort of Bridlington, together with the smaller coastal settlements of Hornsea and Withernsea. Part of the urban fringe of the City of Hull extends northwards into Holderness.

Traditional farmsteads, houses and other buildings characterised by red brick and pantiles. Occasional buildings towards the coast constructed from Holderness cobbles and older buildings including churches often built in limestone.

Beverley Minster, a large gothic building completed in 1425, and Burton Constable, an Elizabethan country house whose parkland was landscaped by Lancelot ‘Capability’ Brown, are key heritage assets.

The adjoining Yorkshire Wolds NCA has provided inspiration to artists and poets, the most notable being David Hockney.
Holderness is a productively farmed, low-lying landscape located east of the Yorkshire Wolds. A broad, undulating plain, centred on the valley of the River Hull, this largely rural area is shaped by modest changes in topography, tree cover and land use.

The gentle terrain undulates from the Wolds to the North Sea and contains widespread remnants of glacial features. Deposits of boulder clay and alluvium cloak the underlying Chalk strata, creating rich, loamy and clayey soils which support arable cultivation. Dried-out post-glacial meres are common, and Hornsea Mere, designated as an SSSI for its marginal habitats of species-rich fen, carr woodland and reed swamp, is one of the few post-glacial meres that retain any water. It is also a Special Protection Area (SPA) for populations of wintering wildfowl including gadwall, goldeneye and pochard, and the reedbeds provide habitat for hundreds of breeding pairs of reed warbler, and roosting areas for large numbers of starling and swallow.

The River Hull, the most northerly chalk river system in Britain, originates on the southern edge of the Yorkshire Wolds before entering the alluvial flood plain of Holderness. Its headwaters are designated as an SSSI as its calcium-rich waters support scarce plant species such as flat-stalked pondweed and river water-dropwort. Otters are also re-colonising in the upper reaches. Within the wider Hull Valley, drainage ditches and semi-improved flood plain pastures at Swinemoor and Figham Common provide wildlife habitats. The Hull Valley supports important bird species including lapwing, snipe and redshank. There are rare remnants of species-rich grassland occurring around Hornsea and Lambwath Meadows, where low-lying, seasonally flooded hay fields are maintained by traditional farming practices.

Fens are found along the upper reaches of the River Hull between Driffield and Wansford and reed swamp at Pulfin Bog. Man-made waterbodies such as the Leven Canal and Tophill Low Reservoir retain water and drain the land for agriculture. In 1802, former meres and fens of Leven Carrs were dug to construct the Leven Canal, stretching 5 km between Leven and the River Hull.
Evidence of this connectivity with the former surrounding marshland survives through the rich aquatic and water-margin flora that these waterbodies support. Tophill Low Pumping Station, south of Driffield, contains two artificial reservoirs which are havens for wintering wildfowl. Former sand and gravel pits such as those at Brandesburton and Pulfin now act as wetland habitats as well as providing recreation by way of fishing and water sports.

Arable cultivation accounts for 82 per cent of land cover. Mainly cereals and root crops are grown on the lower slopes of the Wolds and the slightly raised land between Hull and the North Sea, while in the lower reaches of the Hull Valley root crops and vegetables are grown. Arable farmland also supports a number of declining farmland birds, mainly grey partridge, skylark, barn owl, corn bunting, yellowhammer, linnet and tree sparrow. Fragmented patchworks of grasslands, ditches, small copses, hedgerow trees and hedgerows remain in some parts of the NCA, providing habitats for farmland birds.

Fields are generally large and woodland cover sparse, and in the Hull Valley the large fields, bounded by ditches and dykes, contribute to an open landscape character with long and open views throughout. Where woods do occur, they provide enclosure and structure, but areas of ancient woodland are limited.

Eastwards, the coastal area is characterised by a strip of coastal farmland, extensive caravan parks, holiday homes, wind-pruned trees and visible evidence of coastal erosion. Material eroded from the soft clay cliffs of the Holderness coastline is carried south by waves and currents to Spurn Head and to offshore sand banks at the mouth of the Humber Estuary, where the silt and mud contribute to estuarine sediments. Further south along the Lincolnshire coast, this sediment transfer helps the Humber to adjust to sea level rise and reduces erosion in Lincolnshire.

In the marine environment around Holderness, the North Sea is an important shellfish ground of significance to the local economy, with the largest port located at Bridlington and additional landings at Hornsea and Withernsea.
In the sparsely populated areas, there is a strong sense of rural character owing to farmland, dispersed villages and hamlets. Village ponds and greens are a common feature and church spires are prominent landmarks in this flat, open landscape. Farmsteads are often large and widely dispersed. Brick and pantiles are the common building materials and are of a soft, rich red colour, long and narrow in shape. Limestone imported from the Southern Magnesian Limestone ridge appears in some buildings such as Beverley Minster where the slender west towers can be seen above the surrounding countryside from kilometres around.

Coastal towns and villages are dotted along the coastline with Bridlington being the largest, where older buildings are constructed with the distinctive herringbone pattern of beach cobbles of Holderness. A number of churches along the coastal belt are built from this material, sometimes used in combination with brick. Small market towns such as Beverley and Driffield have strong agricultural associations and west of Beverley is a historic area of common grazing land known as Beverley Westwood. This includes mature trees dotted across an open, grazed landscape with Burton Bushes providing a small patch of remnant ancient woodland. Southwards, the urban settlement of Hull expands into Holderness with its extensive development of housing, industry, roads and pylons contrasting against the lightly settled rural areas.

A small number of active sand, gravel and chalk quarries are located south of Brandesburton, near Keyingham and south-west of Beverley. Brandesburton Pits are generally used for fishing and watersports and the borrow pits at Pulfin (the largest one known as High Eske) are a nature reserve managed by the Environment Agency. Aggregate dredging occurs far offshore in licensed zones near the southern part of the coast which extends into the Humber Estuary NCA.

There is a low density of public rights of way but minor roads and quiet lanes link settlements, enabling walking, cycling and horse riding opportunities. The Trans Pennine Trail, an important strategic route, provides links with Hull in the adjoining Humber Estuary NCA. Following the 24-kilometre Hull–Hornsea Rail Trail to Hornsea, this former railway line has recently been upgraded to a bridleway. A short stretch of the National Cycle Route, the Way of the Roses, runs through the adjoining Yorkshire Wolds into Bridlington and an 80-kilometre long-distance walking route, the Minster Way, runs between York and Beverley minsters. Coastal access along parts of the Holderness coast is currently limited owing to caravan sites and rapid erosion. Any opportunities identified to extend access would have to include ‘roll back’ provision. The seaside resort of Bridlington is the home of David Hockney who, in partnership with Welcome to Yorkshire, has created an official Hockney tourist trail featuring a number of sites across Yorkshire, particularly focusing on places that he has painted in the adjoining Yorkshire Wolds NCA.
The landscape through time

Chalk underlies Holderness and is deeply buried beneath younger glacial deposits, which consist of boulder clay, gravels and sands, thickening towards the coast. They were deposited by ice sheets, which reached as far as the Wolds. In retreat, the ice sheets left an uneven terrain of hummocky ground, low moraine ridges and kettle holes. Evidence of the conditions at the time is provided by the cliff exposures at Flamborough Head SSSI, Dimlington Cliff SSSI and the gravel pits of Kelsey Hill. Post-glacial meres formed in the uneven ground and hollows left by the glaciers. The sediments deposited in the meres provide evidence of the post-glacial climate and vegetation history. Pollen from Skipsea Bail Mere SSSI includes that of the water chestnut and indicates a post-glacial climatic optimum about 2°C higher than at present. Hornsea Mere is the only surviving example of a large post-glacial lake, and is a remnant of the meres and marshland that were once common in the area.

Along the coastline, the Holderness cliffs are some of the fastest eroding in Europe. Over the last 1,000 years, 26 villages which were recorded in Domesday Book of 1086 have been lost to coastal erosion. The coastline is retreating at an average rate of 1.5 to 2.5 m a year, although coastal erosion can be unpredictable and larger losses than this can occur, with a number of properties at risk.

Evidence suggests that the first settlers arrived in Neolithic times, when the plain probably consisted of lakes, marshes, islands and woodland. Wetland areas spread inland as sea levels rose and the climate cooled over the Bronze Age, this being particularly marked towards the end of the second millennium BC, enabling the use of waterways as a communication link to the Pennines and via the Trent into the Midlands. Fishing, fowling and other marsh-edge activities represented important additional sources of income in these former wetland areas where, prior to enclosure and drainage, the lush grasslands provided a source of summer grazing for surrounding communities.

Settlement was concentrated on the high areas of hills and ridges. Early drainage occurred in medieval times and continued until the mid-18th century when the last reaches of the River Hull were drained. Ancient enclosure occurred in Holderness on the glacial tills, while the fertile peaty carr lands in the Hull Valley continued to be used in common. Open field villages survived until the 17th
century when the landscape must have been a mix of enclosed land, common pastures and open fields, supporting production of grass, corn, hay, sheep and cattle. Parliamentary enclosure introduced a similar pattern of dispersed farmsteads set apart from the villages and areas of large, regular fields enclosed by thorn hedges. The coastal farmland from Hornsea to Bridlington was enclosed early in the 19th century with straight roads and tracks, and the formation of new farmsteads. Large and widely dispersed 18th- and 19th-century farmsteads occurred and industrial-scale pig rearing developed after 1940.

The formation of the low woodland cover of today's landscape began with clearance from the Neolithic period and, by the 11th century, the survival of woodland cover was low except for shelterbelts in coastal farmland and boundary trees and hedges. Ancient woodland is very limited and most woods are of relatively recent origin. A few examples that may link back to the ancient forests include Low Wood with its extensive alder and willow carr, Bail Wood near Aldbrough, and Burton Bushes in Beverley Westwood with its canopy of oak and understory of field maple, wych elm and holly.

Although the buildings no longer remain, there are several sites of medieval interest including Meux Abbey, a Cistercian monastery east of Beverley founded in 1150 on flat, marshy land in the flood plain of the River Hull. Along the coastline there is evidence of deserted medieval villages and a moated motte-and-bailey castle at Skipsea. The coastline was thought vulnerable to invasion during the two world wars and was heavily fortified. Evidence of this can be seen in the First and Second World War pillboxes and beach defence emplacements along the coastline. These are vulnerable to coastal erosion and are now often found on the beaches themselves, such as at Fraisthorpe beach.

The most common building material is brick and pantiles and this has historic links to the brick making industry in Hull and Beverley, which dates back to the 14th century, possibly owing to connections with the Low Countries where the industry was established. Limestone is used in some older buildings such as village churches, some of which date back to Norman times, as at Lockington. The grandest limestone building is found in the historic town of Beverley which has developed around its minster, originally the site of a monastery. Work began on the current structure in 1220 and was completed in 1425. It is regarded as one of the finest examples of perpendicular design, particularly the twin towers of the west front which inspired the design of Westminster Abbey.
Farming is predominantly arable with cereal production covering 38,997 ha. The area is also notable, as are other parts of eastern England further south, for the early use of brick. A fine example of the use of red brick materials for building is Burton Constable, an Elizabethan country house located north of Sproatley village. It was originally a brick manor house built around 1500 with a deer park, the creation of which entailed the clearance of a village. In the 1560s Sir John Constable demolished most of the manor house to build the Elizabethan mansion that we see today: this was completed by the end of the 16th century. The parkland surrounding the house was designed by Lancelot ‘Capability’ Brown who was commissioned from 1772 to 1782 to landscape the park: this involved joining up fish ponds to create two lakes separated by a dam-cum-bridge, tree clumps, sunken fences and a ha-ha.

Most of Holderness remains predominantly rural but there is evidence of housing, road and retail development outside urban and fringe areas along corridors such as the A614 in the north and the A1079, north of Hull and around Beverley. The coastal resorts around Bridlington, Hornsea and Withernsea are influenced by holiday homes and several large caravan parks. At Dimlington, there is gas production with large pipelines stretching 25–30 km offshore to the gas terminal at Easington in the Humber Estuary.

Ecosystem services

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

Provisioning services (food, fibre and water supply)

- **Food provision**: Agricultural land covers more than 71,000 ha (82 per cent of the NCA). Farming is predominantly arable with cereal production covering 38,997 ha (45 per cent of the NCA). Grade 2 land covers 42 per cent of the NCA and is found mainly on the lower slopes of the Wolds along the western edge of Holderness and on slightly raised land. However, the flood plain of the Hull Valley is predominantly Grade 3 land and the lower reaches are farmed to produce vegetables and root crops.
Only 23 per cent of farm holdings manage livestock, including some specialist pig and poultry units. The largest numbers of livestock are pigs totalling 219,500 animals and this food provision is concentrated on a relatively small number of specialised holdings. As few as 10 per cent of agricultural holdings rear pigs and poultry (2009 figures).

- **Water availability**: The chalk aquifer, shared with the Yorkshire Wolds, underlies the NCA and is one of the main contributors of water to the Yorkshire and Humber region, used extensively by businesses and agriculture and for public and private water supply. It also provides much of the base flow of the River Hull and its headwaters and areas of water storage such as the reservoir at Tophill Low. The aquifer is over-abstracted, particularly in the north-eastern area and further south near Hull where abstraction is reduced to prevent saline intrusion.

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

- **Regulating soil erosion**: The main soil types are slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils (48 per cent of the NCA) and slightly acid, loamy and clayey soils with impeded drainage (24 per cent). These soils are vulnerable to erosion and are easily compacted by machinery or livestock, which also carries the risk of surface water run-off in wet conditions and sediment build-up in rivers and other watercourses. Management measures to maintain good soil structure on cultivated land include increasing organic matter content by growing green cover crops, introducing fallow into rotations, retaining stubble over winter and conversion to grassland. Carefully timed activities using farm machinery, particularly during very wet periods, and implementing extensive grazing regimes where feasible will help.

- **Regulating soil quality**: The slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils (48 per cent of the NCA) may suffer compaction and/or capping as they are easily damaged when wet. In turn, this may lead to increasingly poor water infiltration and diffuse pollution as a result of surface water run-off. Management measures on cultivated land that increase organic matter content can help to reduce these problems. Similarly, the slightly acid, loamy and clayey soils with impeded drainage (24 per cent of the NCA) are easily poached by livestock and compacted by machinery when the soil is wet. Weak topsoil structures can easily be damaged. Careful timing of activities is required to reduce the likelihood of soil compaction as well as adopting cultivation practices such as increasing the organic content of soils, introducing fallow into rotations and overwinter stubbles, and avoiding overstocking or using machinery where it would lead to the compaction of vulnerable soils.

- **Regulating water quality**: Holderness falls within the Hull and East Riding Catchment. Within this catchment 73 per cent of waterbodies are classed as moderate, 6 per cent are poor and 3 per cent are bad. The main factor affecting water quality is high nitrate levels leaching into the water, the causes of which include agriculture, industry and sewage disposal systems (private). Solutions include following good agricultural practice such as adherence to nitrate vulnerable zone guidelines and planting cover crops/buffer strips to prevent run-off. By contrast, coastal bathing water quality is good and should be maintained.
Regulating water flow: Groundwater flooding in this NCA can last for several months at a time; once groundwater levels have risen, there is little that can be done to reduce high levels until they fall naturally. The agricultural productivity of the area is dependent on pumped drainage, as it would be naturally waterlogged for much of the time.

Pumped drainage on the River Hull helps protect agricultural land from flooding.

Flooding along the course of the River Hull can affect properties, businesses, the transport infrastructure and farming. This is particularly prevalent around Beverley, and further south in and around the City of Hull and the Humber Estuary where flood events can be heightened by tidal influences. Policies to prevent inappropriate development within flood plains should be supported, farming practices should be modified to safeguard soil resources where there is frequent water inundation and the expansion of flood storage areas should be implemented where appropriate.

Regulating coastal flooding and erosion: The Holderness cliffs erode at an average rate of 1.5 to 2.5 m a year which is part of the important coastal process occurring within the NCA and beyond. This eroded material is transported southwards to contribute to the beaches and intertidal habitat in the Humber Estuary and along the Lincolnshire coast. Current climate change modelling suggests that sea level rise and more frequent storm events may exacerbate coastal erosion and increase the scale of flood events. Where possible, natural processes should be allowed to continue and any modification to sea defences should seek to recognise the importance of naturally eroding cliffs in the NCA.

Cultural services (inspiration, education and wellbeing)

Sense of place/inspiration: A range of factors contribute to the sense of place in the area: its largely flat topography and open views across the sea; low tree cover; the broad, shallow valley of the River Hull with its large field patterns bounded by drainage ditches; the expansive coastline; and coastal towns. Light settlement patterns in rural areas of dispersed villages and hamlets (many with village ponds) and prominent church spires produce a sense of tranquillity and remoteness. The local vernacular of red brick buildings, pantile roofs and local Holderness cobbles for buildings constructed near the coast strengthen the character of the area.
**Sense of history:** The open character of the area with its distinctive boundaries and range of natural and historic features retains a strong sense of having been reclaimed from the sea and marsh over thousands of years, and indeed recently in the prominence of its isolated farmsteads. Monastic sites and granges such as Meux Abbey, a Cistercian monastery east of Beverley, provide witness to medieval colonisation as do deserted medieval villages to the high point and then partial desertion of medieval settlement in the 13th century. The coastline with its anti-invasion defences is highly evocative of its vulnerability to attack during the two world wars.

The 14th-century heritage of brick making in Hull and Beverley can be seen in the Elizabethan country house of Burton Constable, north of Sproatley village. Limestone is used in older buildings such as village churches, the grandest limestone building being Beverley Minster which was begun in 1220 and completed in 1425; it is one of the finest examples of perpendicular design and inspired the construction of Westminster Abbey.

**Tranquillity:** Although the proportion of areas that are undisturbed remains high, they have declined from 82 per cent in the 1960s to 60 per cent in 2007. Strong contributors to tranquillity include the flat, low-lying topography and extensive views, sparse settlement patterns in rural areas, the farmed landscape, inaccessible parts of the coast, and long, distant sea views towards and from the coastline. Tranquillity is reduced around expanding urban settlements and main transport corridors.

**Biodiversity:** There are 15 SSSI designated for their nature conservation value including the River Hull headwaters, the most northerly chalk stream system in Britain, and Hornsea Mere, the largest surviving post-glacial, natural lake in Yorkshire. This is also designated as an SPA owing to the large numbers of wintering wildfowl and nationally important numbers of little gull.

The network of watercourses throughout the NCA provides corridors linking important wetland habitats, thus supporting the protection of designated sites and a diverse range of bird species. Important waterways include the River Hull headwaters, the Leven Canal, Tophill Low Reservoir, Lambwath Meadows and Hornsea Mere, although the last is affected by eutrophication as a result of physical modifications for land drainage and diffuse pollution.

There is scope to maintain, create and restore a range of semi-natural wetland habitats by working with landowners and farmers on sustainable management interventions and exploring environmental stewardship options.

**Geodiversity:** There are currently five nationally designated geological sites (SSSI) and one of both geological and biological interest. These consist of cliffs, gravel pits, bogs and meres, and provide evidence of the environment and conditions during the last glaciation, as well as a post-glacial vegetational history preserved in the peats of the now largely dried-out meres. Interpretation and developing research into the geodiversity of the NCA will contribute to the furthering of scientific understanding of the late Pleistocene and Holocene history of Holderness and surrounding NCAs. Sediment from erosion of the Holderness coast is also essential in sustaining the geomorphological site of Spurn, in the Humber Estuary NCA.
Statements of Environmental Opportunity

**SEO 1: Conserve, manage and enhance the River Hull and associated river system with its many associated drains, dykes and streams to improve water quality and supply, sustainably address flood risk management, and enhance biodiversity and the historic environment through a strategic, landscape-scale approach.**

**For example, by:**

- Maintaining and improving water quality and provision from the chalk aquifer by working with landowners and farmers to adopt sustainable farming practices that will improve filtration into the ground and reduce nutrient run-off by creating a network of meadow grasslands including grass field margins and grass buffers to watercourses and areas of open water.

- Encouraging the growth of crops that require less irrigation and increase on-farm water storage.

- Managing the network of drains, ditches and dykes on rotation so that they continue to function while retaining vegetation to form effective habitats for species such as water voles, thus providing links between wetland and other semi-natural habitats, improving water quality and preserving key landscape features.

- Ensuring that the small number of drains, ditches or dykes in the National Character Area (NCA) that are monastic in origin are managed in such a way as to preserve their archaeological value.

- Seeking opportunities to increase and link wetland habitats within the River Hull corridor including open water, reedbed, fen and wet grassland.

- Seeking opportunities to maintain and increase flood plain grazing marsh owing to its role in storing carbon, ensuring that sites are managed to enhance their biodiversity value.

- Encouraging agricultural practices such as planting winter cover crops, in-field grass areas to prevent run-off, permanent grassland with low inputs, and buffer strips on cultivated land adjacent to watercourses, improving infiltration of rainwater.

- Where feasible, through partnership, seeking opportunities to support habitat enhancement and wildlife opportunities, managing flood risk and avoiding saline intrusion in relevant areas by creating permanent grassland, wet grassland and wet woodlands, and expanding or creating flood storage areas.

**Continued on next page...**
SEO 1: Conserve, manage and enhance the River Hull and associated river system with its many associated drains, dykes and streams to improve water quality and supply, sustainably address flood risk management, and enhance biodiversity and the historic environment through a strategic, landscape-scale approach.

... continued from previous page

- Seeking opportunities to create woodland to reduce flood flows.

- Seeking opportunities to develop joint strategies in relation to the delivery of the Shoreline Management Plan and Catchment Flood Management Plan, ensuring that flood risk from the coast and waterways inland is managed effectively and protecting settlements within the Hull and Coastal Streams Catchment.

- Encouraging nature conservation management and the conservation of geological features of ex-gravel and borrow pits alongside their other uses, which include recreation.
For example, by:

- Encouraging cultivation practices that will benefit wildlife such as farmland bird species (grey partridge, skylark, barn owl, corn bunting, yellowhammer, linnet and tree sparrow) as well as pollinating insects by adopting land management interventions such as fallow within rotations, overwintering stubbles, uncropped field margins, creating pollen and nectar strips, and planting bird seed mixtures.

- Taking opportunities to reduce habitat fragmentation by creating networks, corridors and stepping stones of semi-natural habitats, increasing the resilience of species and habitats to climate change, notably by creating more hedgerows on higher ground and pasture land, managing flood plain grazing marsh, and creating buffer strips of permanent grassland alongside watercourses as well as pollen and nectar strips.

- Working with landowners and farmers to create marginal habitats around designated sites such as reedbed, fen and carr woodland.

- Ensuring that all existing woodlands are brought under sound management and that those with links to ancient woodlands are managed to improve their biodiversity and heritage interest.

- Developing an integrated package of catchment sensitive farming initiatives along the River Hull including the chalk streams of the Yorkshire Wolds to benefit the local farming community and encourage best practice.

- Improving soil and crop management by encouraging the practice of increasing green cover crops such as grasslands on cultivated or bare soil and field margins and adopting appropriate grazing regimes on soils that are vulnerable to compaction.

- Seeking opportunities, notably along the River Hull and the surrounding flood plain and in and around Hornsea, to extend unimproved species-rich grassland and other riparian habitats around key waterways and designated sites, thereby improving water quality and providing wildlife corridors for water voles and bird species including wading birds such as lapwing, snipe and redshank, and other bird species such as yellow wagtail and sedge warbler.

- Seeking new opportunities with landowners and the aggregates industry to maintain and create more wetland habitats associated with sand, gravel and chalk quarries which make a positive contribution to biodiversity, geodiversity and landscape character.
For example, by:

- Responding to rising sea levels, storm events and flooding by promoting coastal adaptation measures and supporting planning policies that avoid development in flood-prone areas.

- On undefended coastlines (where the policy is ‘No Active Intervention’), allowing natural processes to occur so that sediment can provide natural sea defences at Spurn, in the Humber Estuary and on the Lincolnshire coast. This also creates important habitats such as salt marsh, mud and sand flats.

- Seeking opportunities to study post-glacial meres on the Holderness plain to gain an understanding of post-glacial environments before the coastline encroaches.

- Supporting existing partnerships that are working to maintain the high standard of bathing waters in the NCA.

- Ensuring that the expansion of gas pipelines or development of renewable energy schemes is carefully managed to avoid reducing rates of erosion, and to achieve minimum disturbance to marine life and impact on seascape views.
For example, by:

- Working with local communities and schools to interpret the area's historic landscapes: its glacial history of moraine ridges, kettle holes and sediments at Dimlington and Withow Gap; the post-glacial history of the meres; evidence of medieval settlements along the coast (Skipsea Castle, Meux Cistercian Abbey and Watton Gilbertine Priory); and its First and Second World War coastal defences.

- Appropriately managing the historic environment for its contribution to local character and sense of identity and as a framework for habitat restoration and sustainable development.

- Conserving and interpreting archaeological earthworks and sub-surface archaeology, while recognising the high potential for undiscovered remains in this area.

- Seeking opportunities to enable local communities and visitors to enjoy access to the coast and recreation there, including provision of good facilities at its resorts and access to its geological heritage, eroding coastline and wildlife.

- Ensuring that significant built developments do not adversely impact on the open character of the area, helping to maintain viewpoints where there are strong visual links between the chalk ridge of the Wolds and the Holderness plateau as well as sea views from coastal areas.

- Ensuring that woodland planting schemes and biomass crops are carefully located, considering archaeological potential as well as impacts on long, open views.

- Seeking opportunities to work with the farming community by encouraging the maintenance and creation of semi-natural habitats that contribute natural features to the rural landscape, thereby helping to maintain the high levels of tranquillity found in the rural areas that are associated with farmed landscapes away from larger settlements.

- Using understanding of the area's traditional and historic architecture, and its distinct patterns of settlement, to inform appropriate conservation and use of historic buildings, and to plan for and inspire any environmentally beneficial new development which makes a positive contribution to local character and retains key views.

- Carefully ensuring that light spill is minimised through lighting design in new developments to minimise the impact on dark skies.
Additional opportunity

1. Improve access to public enjoyment of the open, rural landscape, the coast and wildlife by improving green infrastructure links between urban and rural/coastal areas and within urban settlements.

For example, by:

- Seeking opportunities to improve access to the natural environment from urban areas by identifying new permissive routes and improving existing rights of way networks to link to the countryside and to coastal resorts.

- Developing initiatives to encourage local communities, particularly in deprived areas, to enjoy their local green space, to take action to improve it and to benefit from the recreation and health benefits that it affords them, including providing wildlife corridors to improve the resilience of species to climate change.

- Incorporating green spaces in new developments such as around the urban fringe of Hull and areas within Bridlington, Hornsea and Withernsea, ensuring a connection of green spaces with semi-natural habitats to benefit wildlife while providing communities with recreational green space.

- Seeking opportunities for community engagement to expand woodland cover in appropriate areas and increase public accessibility to existing woodlands such as Burton Bushes in Beverley Westwood.

- Exploring the potential to develop shorter circular routes linked to existing cycle routes, bridleways and strategic routes.

Bishop Burton. Many villages in Holderness have village ponds which contribute to the strong sense of place.
Supporting document 1: Key facts and data

1. Landscape and nature conservation designations

There are no designations or landscape management plans in this NCA except for a very small proportion of the Flamborough Headland Heritage Coast forming less than 1 per cent of the area.

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

<table>
<thead>
<tr>
<th>Tier</th>
<th>Designation</th>
<th>Name</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>Ramsar</td>
<td>Humber Estuary</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>European</td>
<td>Special Protection Area (SPA)</td>
<td>Hornsea Mere SPA; Humber Estuary SPA</td>
<td>232</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>Special Area of Conservation (SAC)</td>
<td>Flamborough Head SAC; Humber Estuary SAC</td>
<td>7</td>
<td>&lt;1</td>
</tr>
<tr>
<td>National</td>
<td>National Nature Reserve (NNR)</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Site of Special Scientific Interest (SSSI)</td>
<td>A total of 15 sites wholly or partly within the NCA</td>
<td>543</td>
<td>1</td>
</tr>
</tbody>
</table>

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.

Most of the area designated for nature conservation, 232 ha, falls within Hornsea Mere all of which is designated SPA, SAC and SSSI.

There are 210 local sites in the Holderness NCA covering 1,869 ha which is 2 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

<table>
<thead>
<tr>
<th>SSSI condition category</th>
<th>Area (ha)</th>
<th>Percentage of NCA SSSI resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unfavourable declining</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Favourable</td>
<td>205</td>
<td>38</td>
</tr>
<tr>
<td>Unfavourable no change</td>
<td>194</td>
<td>36</td>
</tr>
<tr>
<td>Unfavourable recovering</td>
<td>138</td>
<td>25</td>
</tr>
</tbody>
</table>

**Source:** Natural England (March 2011)

Details of SSSI condition can be searched at: [http://www.sssi.naturalengland.org.uk/Special/sssi/reportIndex.cfm](http://www.sssi.naturalengland.org.uk/Special/sssi/reportIndex.cfm)

2. Landform, geology and soils

2.1 Elevation
Holderness is a low-lying, predominantly flat or gently undulating plain at sea level and rising to 65 m on the lower slopes of the Yorkshire Wolds in the west.

**Source:** Natural England 2010

2.2 Landform and process
Holderness forms a low-lying, broad, flat or gently undulating plain, centred on the valley of the River Hull which flows south to Hull. It is bounded by the North Sea to the east, by the Humber Estuary to the south and the dip slope of the Yorkshire Wolds to the west and north.

**Source:** Holderness Countryside Character Area Description

2.3 Bedrock geology
Holderness is underlain by Cretaceous Chalk, most of which is deeply buried beneath later glacial deposits which have been influential in fashioning the landscape.

**Source:** Holderness Countryside Character Area Description

2.4 Superficial deposits
Glacial deposits, including tills, boulder and glacial lake clays, sands and gravel have formed a low-lying, slightly undulating plain, with evidence of glacial features such as subdued moraine ridges, kettle holes and former meres.

**Source:** Holderness Countryside Character Area Description

2.5 Designated geological sites

<table>
<thead>
<tr>
<th>Tier</th>
<th>Designation</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>Geological Site of Special Scientific Interest (SSSI)</td>
<td>5</td>
</tr>
<tr>
<td>National</td>
<td>Mixed Interest SSSIs</td>
<td>1</td>
</tr>
<tr>
<td>Local</td>
<td>Local Geological Sites</td>
<td>25</td>
</tr>
</tbody>
</table>

**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](http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm)

2.6 Soils and Agricultural Land Classification
The glacial till and alluvium which cloak the underlying Chalk strata, create generally rich loamy and clayey soils which support intensive arable cultivation. Grade 2 agricultural land is found on the lower slopes of the Wolds along the western edge of the NCA, and on slightly raised land elsewhere; especially
between Hull and the North Sea coast. Fertile soils also occur in the lower reaches of the valley north of Hull, where drainage enables cultivation of vegetables and root crops. The soil composition of Holderness breaks down as follows: slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils, covering 48 per cent of the area; slightly acid loamy and clayey soils with impeded drainage covering 24 per cent; loamy and clayey soils of coastal flats with naturally high groundwater over 8 per cent; loamy and sandy soils with naturally high groundwater and a peaty surface covering 7 per cent; freely draining lime-rich loamy soils, 4 per cent; freely draining slightly acid loamy soils, 3 per cent; loamy and clayey flood plain soils with naturally high groundwater, 3 per cent; and freely draining slightly acid but base-rich soils, 2 per cent.

Source: Holderness Countryside Character Area Description, Natural England (2010)

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

<table>
<thead>
<tr>
<th>Grade</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Grade 2</td>
<td>36,547</td>
<td>42</td>
</tr>
<tr>
<td>Grade 3</td>
<td>43,985</td>
<td>50</td>
</tr>
<tr>
<td>Grade 4</td>
<td>1,661</td>
<td>2</td>
</tr>
<tr>
<td>Grade 5</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Non-agricultural</td>
<td>1,087</td>
<td>13</td>
</tr>
<tr>
<td>Urban</td>
<td>3,898</td>
<td>45</td>
</tr>
</tbody>
</table>

Source: Natural England (2010)

### 3. Key water bodies and catchments

#### 3.1 Major rivers/canals

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

- Driffield Canal 8 km
- Frodingham Beck 3 km
- Gypsey Race 2 km
- Holderness Drain 20 km
- Kelk Beck 9 km
- Leven Canal 5 km
- Monk Dike 8 km
- Old Howe 8 km
- River Hull 36 km
- Watton Beck 5 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 upper tributaries of the River Hull arise from calcareous springs originating from the Yorkshire Wolds NCA and flowing east to enter the plain. The Hull headwaters form the most northerly chalk stream system in Britain and are designated a SSSI. The River Hull runs southwards through a shallow valley which dominates the western landscape of Holderness and supports a diverse range of plants and animals. The southernmost end of the River Hull towards Hull becomes tidal with an increase in salinity. These lower reaches of the river are enclosed by floodbanks to protect adjoining farmland. The Leven Canal stretches for 5 km between Leven and the River Hull supporting a remnant of the flora and fauna formerly found in what was surrounding marshland prior to drainage for cultivation.

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).
3.2 Water quality
The total area of Nitrate Vulnerable Zone is 80,807 ha, or 93 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:


4. Trees and woodlands

4.1 Total woodland cover
The NCA contains 2,273 ha of woodland, 3 per cent of the total area, of which 79 ha is ancient woodland.

4.2 Distribution and size of woodland and trees in the landscape
The NCA is a very sparsely wooded landscape with small scattered blocks, often occurring on sandy deposits, and as shelterbelts around farmsteads. The sparse woodland cover, few of them of ancient origin, is testament to the woodland clearance and drainage for crop cultivation that began with the earliest settlers. A small number of ancient woodlands remain such as Low Wood with its extensive alder and willow carr characteristic of ‘wet’ areas at Hornsea Mere, Bail Wood near Aldbrough, and Burton Bushes at Beverley.
Source: Holderness Countryside Character Area Description; Natural England (2012)

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

<table>
<thead>
<tr>
<th>Woodland type</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaved</td>
<td>1,526</td>
<td>2</td>
</tr>
<tr>
<td>Coniferous</td>
<td>202</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Mixed</td>
<td>180</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Other</td>
<td>365</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

Source: Forestry Commission (2011)

<table>
<thead>
<tr>
<th>Type</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient semi-natural woodland</td>
<td>79</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Planted Ancient Woodland (PAWS)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

5. Boundary features and patterns

5.1 Boundary features
Fields are often divided by ditches, especially on the flood plain of the River Hull, and by hedgerows on higher ground. Between 1999 and 2003 27 km or just 2 per cent of the estimated length of boundary features in the NCA were in Countryside Stewardship schemes. Capital agreements for linear features included fencing (31 km), hedgerow management (20 km), hedgerow planting and restoration (63 km), and restored boundary protection (13 km). Currently 932 km of the NCA boundary features are now in Environmental Stewardship schemes, with the highest proportion being hedgerow options.

Source: Holderness Countryside Character Area description; Countryside Quality Counts (2003), Natural England (2011)

5.2 Field patterns
Fields are generally large, bounded by ditches in some areas, especially on the flood plain of the River Hull. Field patterns around settlements often show evidence of medieval enclosure, with larger more rectilinear fields a result of later enclosure and drained flood plains.

Source: Holderness 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
Farm holdings are predominantly arable, general cropping and horticulture, accounting for 459 holdings, 58 per cent of all holding, in 2009. This figure has remained relatively stable between 2000 and 2009, only slightly increasing in numbers. Only 85 or 11 per cent of farm holdings are livestock. This figure has remained relatively stable between 2000 and 2009, slightly increasing in numbers. There are some specialist pig and poultry holdings, 10 per cent, but dairy production only accounts for 2 per cent of holdings.

Source: Agricultural Census, Defra (2010)

6.2 Farm size
Large farms over 100 ha are the most common farm size, accounting for 224 units and the large majority of the farmed land, 75 per cent. Nearly half of all holdings are over 50 ha and account for 90 per cent of the area of farmed land. While there are 261 holdings under 20 ha they account for just 2 per cent of the area of farmed land. Between 2000 and 2009, trends show a decrease in numbers of all sizes of farm holdings except for those between 20 and 50 ha which have shown a small increase. The biggest decrease is of small holdings of 5 ha by 28 holdings.

Source: Agricultural Census, Defra (2010)
6.3 Farm ownership
2009: Total farm area = 71,153 ha; owned land = 51,483 ha
2000: Total farm area = 71,632 ha; owned land = 49,907 ha

Seventy-two per cent of the farmed area is owned land which is relatively high within the region.

Source: Agricultural Census, Defra (2010)

6.4 Land use
The land is predominantly used for arable and horticultural farming; accounting for 59 per cent of the farmed area which is relatively high, with a further 21 per cent put down to cash roots, oilseeds and other arable crops. Grass and uncropped land accounts for 17 per cent of the land. Between 2000 and 2009 the area of arable farming (cereals and oilseed) increased from 49,421 ha to 50,239 ha, mainly due to an increase in oilseed crops.

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers
There were 219,500 pigs in the NCA in 2009, which represents a drop in numbers from 298,300 in 2000 or a 3 per cent decline. The number of sheep has decreased by 2 per cent from 24,200 in 2000 to 23,100 in 2009. The number of cattle has dropped by 1 per cent from 21,600 in 2000 to 18,400 in 2009.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour
In 2009 the largest number of holdings, 1,197, was managed by principal farmers covering 49 per cent of the farmed area. Since 2000 they have fallen slightly in numbers by 220. In 2009 there were 120 salaried managers, while the numbers of other workers were: full time workers, 552, casual/gang workers, 345, part time workers, 173. Between 2000 and 2009 the number of full time workers had fallen significantly by 476, while casual/gang workers fell by 139, part time workers by 48 and salaried managers by 15.

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
The main habitats are wetlands, unimproved grasslands, woodlands and scrub. Semi-natural vegetation is fragmented due to land drainage and the predominance of arable farming, but there is some unimproved neutral grassland on the boulder clays. Tree and woodland cover is sparse while marshland and other post-glacial features were once common with Hornsea Mere being the largest surviving example of a natural lake. Waterways now provide important habitats with the River Hull and its headwaters flowing from north to south supporting a diverse range of plants and animals. The Driffield and Leven Canal is also an important corridor stretching for 5 km. The proximity of the coast and Humber estuary has an important influence on the landscape and its biodiversity.

River Hull and riparian fringes
The River Hull headwaters are the most northerly chalk stream system in Britain and designated SSSI. The upper reaches support species such as water crowfoot *Ranunculus penicillatus*, lesser water parsnip *Berula erecta*, mare's-tail *Hippuris vulgaris* and spiked water milfoil *Myriophyllum spicatum*. The scarce river water-dropwort occurs in the middle reaches where it is at the northern limit of its British range. Along the River Hull aquatic and marginal vegetation provide habitats for a range of invertebrates. Otter *Lutra lutra* have recently re-colonised the upper reaches of the river and its headwaters, but the once-common water vole *Arvicola terrestris* is now confined to a few isolated populations.

Influenced by the River Hull the riparian habitats are of great value for wildlife such as species-rich wet grassland and in the upper reaches marsh is quite extensive between Driffield and Wansford.

The diversity of the River Hull valley is reflected in the range of bird species that it supports including several waders such as; lapwing *Vanellus vanellus*, snipe *Gallinago gallinago* and redshank *Tringa tetanus*. More widely occurring bird species include wildfowl such as mallard *Anas platyrhynchos* and mute swan *Cygnus olor*, together with yellow wagtail *Motacilla flava*, sedge warbler *Acrocephalus schoenobaenus*, reed warbler *Acrocephalus scirpaceus* and reed bunting *Emberiza schoeniclus*. The grasslands adjacent to the watercourses are important for barn owl *Tyto alba* and in winter, short-eared owl *Asio flammeus*.

Mere and other wetlands
Once part of the extensive wetland that covered Holderness, Hornsea Mere remains as the largest surviving post-glacial natural lake in Yorkshire. It is a refuge for wintering wildfowl such as gadwall *Anas strepera*, shoveler *A. clypeata*, goldeneye *Bucephala clangula*, pochard *Aythya ferina* and tufted duck *A. fuligula*. Nationally important numbers of little gull *Larus minutus* also congregate in large numbers in autumn, while the fringes hold important numbers of reed warbler *Acrocephalus scirpaceus*. The national and international significance of this habitat and the species is reflected by its designations of Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA).

Marginal habitats found around the fringes of Hornsea Mere, the River Hull (between Driffield and Wansford) and at Pulfin Bog along the Leven Canal, contain species-rich fen, carr woodland and reed swamp, the latter of entomological interest supporting a number of scarce craneflies, danceflies, snail-killing flies and wainscot moths.
The Leven Canal constructed in 1802 stretches for 5 km between Leven and the River Hull and supports a remnant of the flora and associated fauna that would have been found in the surrounding marshland prior to its drainage for cultivation. The nationally rare narrow small-reed *Calamagrostis stricta*, a relict sub-arctic species, grows along the Canal where it also hybridises with purple small-reed *Calamagrostis canescens*.

Extraction of sand and gravel deposits has created pits that have filled with water and re-vegetated, such as the linear pits at Brandesburton and borrow pits by the River Hull at Pulfin, which support what may be the only native population of water soldier *Stratiotes aloides* in Yorkshire.

At Tophill Low pumping station two artificial reservoirs built close to the River Hull, south of Driffield, have become a haven for wintering wildfowl supporting nationally important populations of gadwall *Anas strepera*, shoveler *A. clypeata* and tufted duck *Aythya fuligula*, demonstrating how artificial waterbodies for water storage can also provide valuable habitats for wildlife.

**Farmland**
The predominantly arable farmland in the NCA is intensively managed grassland with the majority of farmland having lost important features for wildlife such as, winter stubbles, uncropped field margins and boundary habitats. Typical farmland species survive where there is a patchwork of arable, grassland, ditches, small copses and hedgerows. Species associated with such arable areas are barn owl *Tyto alba* and corn bunting *Emberiza calandra* as well as grey partridge *Perdix perdix*, skylark *Alauda arvensis*, tree sparrow *Passer montanus* and hare *Lepus capensis*. After crops have been sown on the large open arable fields in the autumn, important numbers of golden plover and lapwing congregate.

**Neutral grassland**
Unimproved species-rich grassland occurs on soils with a neutral pH with notable remnants around Hornsea and Lambwath Meres. The most significant of which occurs along the valley of the Lambwath Stream near Withernwick where low-lying, seasonally flooded hay fields are maintained by traditional farming practices of hay-cutting followed by aftermath grazing.

**Woodland, hedgerows and scrub**
The landscape of Holderness with its long views, large arable fields and sparse woodland is due to clearance and drainage by early settlers. The few remaining woods that may have had links to ancient forests are Low Wood with its extensive alder and willow carr, characteristic of ‘wet’ areas at Hornsea Mere, Bail Wood near Aldbrough and Burton Bushes at Beverley.

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

More information about Biodiversity 2020 can be found at:

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.

<table>
<thead>
<tr>
<th>Access designation</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal and flood plain grazing marsh</td>
<td>3,106</td>
<td>4</td>
</tr>
<tr>
<td>Broadleaved mixed and yew woodland (broad woodland)</td>
<td>422</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Maritime cliff and slope</td>
<td>163</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Lowland meadows</td>
<td>50</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Fens</td>
<td>13</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Reedbeds</td>
<td>13</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Purple moor grass and rush pastures</td>
<td>1</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

Sources: Natural England (2011)

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8. Settlement and development patterns

8.1 Settlement pattern

Settlements are generally located on higher ground, often surrounded by smaller fields. Hamlets and villages are widely dispersed, with some closely packed and nucleated, while others are strung out along roads. Much of the area is predominantly rural with widely dispersed large farmsteads. There is more recent development on urban fringe areas, such as north of Hull and around Beverley, and along transport routes such as the A614 in the north and the A1079. The coastal landscape around Bridlington and Hornsea is influenced by holiday homes and caravan parks.

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

8.2 Main settlements

The main towns and cities within the NCA have the following populations: Beverley 29,110, Bridlington 33,000, Driffield 11,477 and Hornsea 8,243. The city of Hull lies close to the southern boundary of the NCA with the largest population of 243,589. The total estimated population for this NCA (derived from ONS 2001 census data) is: 230,792.


8.3 Local vernacular and building materials

Local buildings are commonly constructed from red brick, flint and distinct Holderness ‘cobbles’, (the latter found near the coast), with pantile or fishscale roofs. Limestone is also used in some buildings.

Source: Holderness Countryside Character Area description; Countryside Quality Counts (2003)
9. Key historic sites and features

9.1 Origin of historic features
There was widespread clearance of woodland from the Neolithic period. Wetland areas spread inland as sea levels rose and climate cooled over the Bronze Age.

There has been a long history of mixed arable and pasture, and extensive use as summer grazing on land surrounding settlements prior to drainage and enclosure. Arable intensified in tandem with drainage from the 18th century with the cultivation of root crops and vegetables.

Field patterns around settlements often show evidence of medieval enclosure, with larger more rectilinear fields a result of later enclosure and drained flood plains.

The coastal farmland from Hornsea to Bridlington was subject to extensive early-to mid-19th century enclosure, with straight roads and tracks, and the formation of new farmsteads.

Large and widely dispersed farmsteads and large-scale piggeries, mostly of mid-19th century date, occur across the area; industrial-scale pig rearing has developed in the post-1940 period.

The historic town of Beverley has developed around its Minster.

Along the river valleys, deposited fluvial soils contain important palaeoenvironmental remains of past land use and changes in sea levels.

Erosion of soft boulder clay leads to the exposure of new archaeological sites as well as the loss of existing sites, settlements and agricultural land. Archaeological sites have also been identified along the beach during seasons of sand movement.

There are a small number of historic parklands, such as at Burton Constable and Thwaite Hall.

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

9.2 Designated historic assets
This NCA has the following historic designations:

- 2 Registered Parks and Gardens covering 404 ha
- 0 Registered Battlefields
- 87 Scheduled Monuments
- 1,300 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
- Just greater than half a per cent of the NCA or 482 ha is classified as being publically accessible.
- There are 623 km of public rights of way at a density of 0.7 km per km².
- There are no national trails within the NCA.

**Sources: Natural England (2010)**

The area of publically accessible land in the NCA is very low. The coast offers tourism and recreation opportunities at Bridlington and Hornsea where there are holiday homes and caravan parks, and beaches.

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

<table>
<thead>
<tr>
<th>Access designation</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Trust (Accessible all year)</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Common Land</td>
<td>425</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Country Parks</td>
<td>77</td>
<td>&lt;1</td>
</tr>
<tr>
<td>CROW Access Land (Section 4 and 16)</td>
<td>482</td>
<td>&lt;1</td>
</tr>
<tr>
<td>CROW Section 15</td>
<td>12</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Village Greens</td>
<td>5</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Doorstep Greens</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Forestry Commission Walkers Welcome Grants</td>
<td>16</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Local Nature Reserves (LNRs)</td>
<td>22</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Millennium Greens</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Accessible National Nature Reserves (NNRs)</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Agri-environment Scheme Access</td>
<td>24</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Woods for People</td>
<td>102</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

**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) the NCA has high levels of tranquillity found in the rural areas away from the larger settlements and main roads.

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

<table>
<thead>
<tr>
<th>Category of tranquillity</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest value within NCA</td>
<td>46</td>
</tr>
<tr>
<td>Lowest value within NCA</td>
<td>-68</td>
</tr>
<tr>
<td>Mean value within NCA</td>
<td>6</td>
</tr>
</tbody>
</table>

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 the areas of highest intrusion are found around the settlements of Beverley, Driffield, Bridlington and Hull (the latter in the adjoining NCA) and along connecting transport routes mainly A164, A165, A1035 and A1033.

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

<table>
<thead>
<tr>
<th>Category of intrusion</th>
<th>1960s (%)</th>
<th>1990s (%)</th>
<th>2007 (%)</th>
<th>% change (1960s-2007)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disturbed</td>
<td>17</td>
<td>26</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td>Undisturbed</td>
<td>82</td>
<td>71</td>
<td>60</td>
<td>-21</td>
</tr>
<tr>
<td>Urban</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are an increase of 18 per cent disturbance with a small increase in urbanisation of 3 per cent. However, 60 per cent of the area remains largely undisturbed which contributes to its largely remote and rural character.

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

- Joint Character Area GIS boundaries, Natural England (data created 2001)
- National Parks and AONBs GIS boundaries, Natural England (2006)
- National Forest Inventory, Forestry Commission (2011)
- Countryside Quality Counts Draft Historic Profiles, English Heritage (2004)*
- BAP Priority Habitats GIS data, Natural England (March 2011)
- Special Areas of Conservation data, Natural England (data accessed in March 2011)
- Special Protection Areas data, Natural England (data accessed in March 2011)
- Ramsar sites data, Natural England (data accessed in March 2011)
- Sites of Special Scientific Interest, Natural England (data accessed in March 2011)

- Source protection zones, Environment Agency (2005)
- 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.
Recent changes

Trees and woodlands
- Data from Countryside Quality Counts for the period 1999 to 2003 indicates that a significant expansion of woodland cover occurred resulting from woodland grant scheme agreements.
- New planting is mostly in small, scattered blocks or shelterbelts.
- In some locations, an aging population of hedgerows trees is not being replanted, weakening the mosaic of farmland habitats and impacting on the character of the landscape.

Boundary features
- While many of the field boundaries are ditches and dykes, the data from Countryside Quality Counts for the period 1999 to 2003, shows that countryside stewardship agreements were for fencing, hedge management, planting and restoration, totalling 127 km (2 per cent of the estimated boundary length of the NCA).
- Data from Natural England (March 2011), shows an increase from 2 per cent to 14 per cent of the estimated boundary length of the NCA as being managed under agri-environment agreements. These are mainly for ditches, hedgerows, stone walls and woodland.

Agriculture
- During the period 2000–2009, arable, general cropping and horticulture remained dominant, specialist pig units remained unchanged but there was a reduction by 54 per cent in specialist poultry.
- During the period 2000–2009, there was a slight increase from 70 per cent to 72 per cent of the farmed area in private ownership. Overall, this is relatively high within the region.
- Large farms (over 100 ha) were the most common size, although between 2000 and 2009, they have decreased in number by 5 per cent. Only 0.3 per cent of the farmed area was covered by small holdings under 5 ha, and these have decreased by 20 per cent.
- During the period 2000–2009, the largest number of holdings was managed by principal farmers covering 49 per cent of the farmed area, but these have fallen in number by 16 per cent since 2000. The number of full time workers has fallen by 46 per cent.

Settlement and development
- There is evidence of road, retail and housing development in urban and fringe areas along route corridors, mainly the A614 in the north, the A1079 north of Hull and around Beverley (including a new by-pass).
- There is an increasing number of proposals for both on and offshore wind farms.
Semi-natural habitat

- The main habitats are wetlands, unimproved grasslands, woodlands and scrub. Semi-natural vegetation is fragmented due to land drainage, canalised waterways and the predominance of arable farming. However, there is scope to maintain, create and restore a range of wetland, semi-natural habitats by working with land owners and farmers on management interventions and exploring environmental stewardship options.

- Semi-natural habitats designated for nature conservation cover only 1 per cent of the NCA. Overall, only 38 per cent of SSSI are in favourable condition, 25 per cent in unfavourable recovering condition and 36 per cent in unfavourable, no change. However, by creating, restoring and maintaining waterways and their associated riparian habitats such as species-rich, wet grasslands for wildlife, an important network of habitats will have been created as part of the landscape-scale approach to biodiversity, thereby addressing habitat fragmentation and ultimately helping SSSI reach favourable condition.

- The River Hull Headwaters SSSI, the most northerly chalk stream in Britain supports a diverse range of plants and animals as does Hornsea Mere SSSI, the latter also being an important glacial feature. However, these habitats are currently unable to reach favourable condition due to physical modifications of land drainage and eutrophication from diffuse pollution.

- The most common countryside stewardship agreements in 2003 were for lowland pastures on neutral/acid soils (254 ha), regeneration of grassland/semi-natural vegetation (212 ha), and stubble.

- More recently, through the Higher Level Stewardship Scheme, 932 km of boundary features are covered by agreements, with the highest proportion being hedgerow options. Other options include non-payment option for permanent grassland (1,131 ha), organic management (686 ha), permanent grassland with low inputs (350 ha), maintenance of grassland for target features (260 ha), management of archaeological features on grassland (183 ha) and buffer strips (138 ha).

Historic features

- In 1918 approximately 2 per cent of the NCA was historic parkland, but by 1995 it is estimated that 51 per cent had been lost, with 31 per cent of the remaining parkland supported by historic parkland grants and 39 per cent in agri-environment schemes.

- It is estimated that 82 per cent of historic farm buildings remain unconverted and 89 per cent are structurally intact.

Coast and rivers

- The Holderness coastline is fast-eroding but forms an essential part of the coastal system between Flamborough Head and Gibraltar Point, allowing sediment to be transported from the Holderness shoreline to be deposited southwards, in the Humber Estuary and the Lincolnshire Coast.

- The bathing waters along the Holderness coastline are of high standard with the main resorts of Hornsea, Withernsea, and Bridlington North Bay, holding ‘Keep Britain Tidy’ Blue Flag awards (2012). This is likely to be maintained through partnership work involving the Environment Agency, Yorkshire Water, and local authorities.
A network of artificial drains (Beverley, Barmston and Holderness) are regulated by pumping stations helping to alleviate flood risk while optimising drainage and enabling a large area of the East Riding of Yorkshire to be effectively farmed. The Hull Valley and Holderness drains lie within the catchment sensitive farming priority area for the county. Much of the drainage system in individual fields and those managed by internal drainage boards has been improved to take advantage of the infrastructure.

In 1995, the biological river water quality was predominantly excellent and the chemical water quality predominantly very good. However, the Water Framework Directive (WFD) classifications (2009) show that of the 68 water bodies designated in the Hull and East Riding catchment, 20 are classed as natural and 48 are artificial. Biological and chemical data shows that 50 water bodies (73 per cent) in the Hull and East Riding catchment are moderate, 4 (6 per cent) are poor and 2 (3 per cent) are bad.

Minerals
- The Yorkshire and Humber aggregate mineral resources map shows a small number of active sand, gravel and chalk quarries south of Brandesburton, near Keyingham and south-west of Beverley.
- Aggregate dredging takes place offshore in licensed zones and there are a number of sites located adjacent to the southern part of the coast and in the Humber Estuary NCA.

Drivers of change

Climate change
- Climate change trends suggest sea level rise and more frequent storm events. If realised, these climatic conditions would exacerbate coastal erosion and increase flooding. Planning policies should advocate coastal adaptation measures and avoid inappropriate developments in flood-prone, vulnerable areas.
- Increased summer droughts could result in greater demands from groundwater resources associated with the underlying chalk aquifer. Low groundwater levels will reduce river flows to the headwaters of the River Hull and its ecology.
- Increased rainfall may cause ground water flooding and a number of semi-natural habitats to change. For example, increased water in flood plain meadows could change the habitat to species-poor swamp, attracting different birds and invertebrates.
- Small or isolated habitats may be lost, changes to species range migration may occur, changes in tide levels would affect coastal and flood plain grazing marsh and should increased coastal erosion occur, it may reduce (or possibly increase), the extent of maritime cliffs and slopes.
- Longer growing seasons could potentially lead to double cropping or the introduction of new crops, more resilient to climatic/meteorological extremes changing the agricultural landscape. The possibility of more severe winter cold, (a suggested consequence of the loss of the north polar ice cap), could limit extension of the growing season and reduce attractiveness of the area to overwintering wildlife.
There is increasing demand for renewable energy. A number of on- and off-shore wind farm proposals are in development as well as a proposed expansion of natural gas storage at Aldborough including installation of a monopile offshore structure. These should be carefully managed for minimum disturbance to marine life and impact on seascape views, and on land, viewpoints should be maintained where there are strong visual links between the chalk ridge of the Wolds and the Holderness plateau.

Expansion of gas pipelines or development of renewable energy schemes may need to be carefully managed to avoid reducing rates of erosion, for minimum disturbance to marine life and impact on seascape views.

Crops that can be used for biofuels, such as oilseed rape, are common across the NCA and may increase if there is further demand, along with crops such as miscanthus. Planting of miscanthus should be sensitive taking into account areas where there may be an impact on long, open views.

Other key drivers

- The chalk aquifer underlying Holderness is used extensively for public water supply, industry and agriculture and provides the base flow of the River Hull and its headwaters. Protection of water resources may be required as the aquifer is over-abstracted, with ‘no water available’ in some areas. In the south and east, restrictions are in place to prevent saline intrusion.

- 93 per cent of Holderness is designated a nitrate vulnerable zone (NVZ) and the chalk aquifer beneath the Yorkshire Wolds and Holderness is affected by nitrates and sewage which may continue to affect water quality. Opportunities to address water quality issues include; delivering catchment sensitive farming initiatives/encouraging good practice and ensuring adequate maintenance of private sewage treatments.

- A number of settlements within the Hull and coastal streams catchment may be vulnerable to frequent flooding from rivers and the sea, particularly when water is unable to drain into the Humber Estuary during high tides, and inland from surface water due to the low-lying topography.

- Flood risk management assets in the Hull and Holderness valleys are constantly assessed by the Environment Agency for value for money and adaptation to climate change, which may lead to some pumping stations being categorised as uneconomic. Partnership working with a range of organisations and land managers to manage flood risk effectively including accessing appropriate funding mechanisms, should be sought.

- Long term trends identified in the shoreline management plan predict a slow cliff recession in some areas of Holderness on unprotected cliffs, which may bring conservation opportunities regarding re-naturalisation of the coastal strip.

- Post-glacial meres on the Holderness coast form low points with peat deposits which are prone to coastal erosion. Where they are associated with watercourses flowing inland, coastal flood defences may be required such as those at Tunstall.

- Flow patterns of the River Hull, are affected by river profile, dredging, habitat make-up, sedimentation and installation of structures such as weirs and locks. Accumulatively these could discourage fish populations to thrive by reducing good fishery habitats or by directly impeding fish passage further upstream.
Biological and chemical data from the WFD classifications show that Hornsea Mere is poor. A sluice regulating the outfall from Hornsea Mere regulates overflows to the receiving watercourse (Stream Dyke) and drains an outlying area of Hornsea. Lacking mains drainage, there is potential for private sewage disposal treatments to enter watercourses. This will affect bathing water quality.

Farmland features have declined including winter stubble, uncropped field margins, ditches and hedgerows. Encouraging land managers to take up environmental stewardship should incorporate farmland habitats and develop networks of linked habitats to help retain farmland features and enhance habitats for wildlife, particularly farmland birds.

Ancient woodland is scarce in Holderness and should be preserved.

The Marine and Coastal Access Act 2009 should provide opportunities to protect the marine environment whilst ensuring access to all parts of the coast by working in partnership with landowners.

The towns of Beverley and coastal resorts of Bridlington, Hornsea and Withernsea are important settlements for recreation and tourism and further opportunities should be explored.

Continued expansion of industry and housing in urban areas and along route corridors will increase pressure on land and increase light saturation of dark skies. Opportunities for incorporating accessible green infrastructure and use of local vernacular for construction of buildings should be sought.

Further development of mineral/aggregates extraction should include conserving interesting geological features exposed by mineral workings and the creation of opportunities for biodiversity enhancement through restoration schemes from minerals planning.

Nationally important gas supplies from as far away as Norway are transported to the Holderness coast through a network of pipelines which come ashore at Dimlington. These are then linked to the Easington Gas terminal in the Humber Estuary NCA. If gas extraction pipelines are expanded to meet increasing energy demands, careful management should be employed to minimise disturbance to sea life, coastal processes and views over seascapes.

Along the Holderness coast, those First and Second World War coastal defences (pillboxes and beach defence emplacements) that are at risk from coastal erosion and should be recorded.
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.
# 40. Holderness

## National Character Area profile:

- **Introduction & Summary**
- **Description**
- **Opportunities**
- **Key facts and data**
- **Landscape change**
- **Analysis**

### Statement of Environmental Opportunity

**SEO 1:** Conserve, manage and enhance the River Hull and associated river system with its many associated drains, dykes and streams to improve water quality and supply, sustainably address flood risk management, and enhance biodiversity and the historic environment through a strategic, landscape-scale approach.

<table>
<thead>
<tr>
<th>Ecosystem Service</th>
<th>Food provision</th>
<th>Timber provision</th>
<th>Water availability</th>
<th>Genetic diversity</th>
<th>Biomass provision</th>
<th>Climate regulation</th>
<th>Regulating water quality</th>
<th>Regulating water flow</th>
<th>Regulating soil quality</th>
<th>Regulating soil erosion</th>
<th>Pollination</th>
<th>Pest regulation</th>
<th>Regulating coastal erosion</th>
<th>Sense of place/inspiration</th>
<th>Sense of history</th>
<th>Tranquility</th>
<th>Recreation</th>
<th>Biodiversity</th>
<th>Geodiversity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEO 1</strong></td>
<td><strong>↑↑↑</strong></td>
<td><strong>↑↑↑</strong></td>
<td><strong>↑↑↑</strong></td>
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</tr>
</tbody>
</table>

**SEO 2:** Work with landowners and land managers to support sustainable food production while enhancing and strengthening the network of farmland features; create and expand habitats in the farmed environment to enhance biodiversity and improve soil and water quality; strengthen resilience of habitats to climate change; and enhance landscape character.

<table>
<thead>
<tr>
<th>Ecosystem Service</th>
<th>Food provision</th>
<th>Timber provision</th>
<th>Water availability</th>
<th>Genetic diversity</th>
<th>Biomass provision</th>
<th>Climate regulation</th>
<th>Regulating water quality</th>
<th>Regulating water flow</th>
<th>Regulating soil quality</th>
<th>Regulating soil erosion</th>
<th>Pollination</th>
<th>Pest regulation</th>
<th>Regulating coastal erosion</th>
<th>Sense of place/inspiration</th>
<th>Sense of history</th>
<th>Tranquility</th>
<th>Recreation</th>
<th>Biodiversity</th>
<th>Geodiversity</th>
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<tr>
<td><strong>SEO 2</strong></td>
<td><strong>↑↑↑</strong></td>
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</table>

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**

**SEO 3:** Allow essential coastal processes to occur, including erosion of the soft clay cliffs, while respecting policies that reduce erosion and flood risk in relation to key coastal settlements.

<table>
<thead>
<tr>
<th>Ecosystem Service</th>
<th>Food provision</th>
<th>Timber provision</th>
<th>Water availability</th>
<th>Genetic diversity</th>
<th>Biomass provision</th>
<th>Climate regulation</th>
<th>Regulating water quality</th>
<th>Regulating water flow</th>
<th>Regulating soil quality</th>
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</table>

**SEO 4:** Enhance people’s understanding and enjoyment of the geodiversity, historic sites, seaside character and remoteness that contribute to the varied sense of place and valuable recreational assets that the area provides.

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
### 40. Holderness

**Introduction & Summary**

**Description**

<table>
<thead>
<tr>
<th>Landscape attribute</th>
<th>Justification for selection</th>
</tr>
</thead>
</table>
| Broad, shallow River Hull valley with large field patterns bounded by drainage ditches and an extensive network of canals and canalised tributaries | - The River Hull, the most northerly chalk stream in Britain, drains into the Humber Estuary to the south and is designated as an SSSI for habitats of reed swamp, fen, carr, and flood plain grassland.  
- The Hull Valley supports important bird species including: lapwing, snipe and redshank.  
- Otter is re-colonising in the upper reaches of the River Hull.  
- The valley is dominated by arable farming mainly vegetables and root crops grown on the drained flood plain.  
- Low-lying flood plain meadows such as at Lambwath are scarce habitats that are seasonally flooded and involve traditional practices of aftermath grazing.  
- Riparian habitats along the watercourses; species-rich wet grassland, species-rich fen, carr woodland and reed swamp.  
- Tophill Low Reservoir attracts large populations of gadwall, shoveler and tufted duck.  
- The watercourses including the Level Canal play a key role in draining the low-lying, surrounding farmland managed by a pumped system, although the area can suffer from groundwater flooding.  
- Sand and gravel pits in the vicinity of Brandesburton, High Eske and Watton Carrs form a series of manmade open water with marginal habitats valuable for wildlife as well as recreation opportunities. |
| A landscape of glacial features of meres, hummocky terrain inland and sweeping, coastline of soft, boulder clay cliffs with some designated sites of geological interest. | - Post-glacial meres forming peat deposits on the coast are historic remnants of once common landscape features including geological SSSI around Skipsea (relict mere with peat deposits).  
- Hornsea Mere is the only significant water-retaining mere in Holderness and largest natural lake in Yorkshire. Designated as an SSSI surrounded by reedbeds, fen and carr woodland and an SPA for overwintering wildfowl.  
- A coastline of narrow beaches and constantly changing, rapidly-eroding cliffs essential for transporting sediment to form beaches and areas of intertidal habitat along the coast to key sites further south (Humber Estuary and on the Lincolnshire coast).  
- Seabirds from adjoining NCAs with SPA designations forage frequently along the Holderness coast.  
- Many small field ponds originate from glacial kettle-holes and depressions in the generally flat landscape separating the moraine ridges running north–south on Holderness.  
- Dimlington Cliffs SSSI and Withow Gap SSSI are designated for the glacial and late glacial sediments respectively, providing insights into environmental conditions during the last glaciation. Both sites are features of geomorphological and geological interest to science and provide opportunities for education as well as further research. |
### 40. Holderness

**Landscape attribute**

<table>
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<tbody>
<tr>
<td>Large-scale arable farming and some livestock production with fields bounded by drainage ditches and some hedgerows on higher ground and pasture land.</td>
</tr>
<tr>
<td>- Large, rectangular arable fields bounded by ditches, marked by lines of reeds and occasional willows on lower land and clipped hedgerows on higher ground to the east and west providing important wildlife corridors.</td>
</tr>
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<td>- Arable farmland supports a number of declining farmland birds - mainly grey partridge, skylark, barn owl, corn bunting, yellow hammer, linnet and tree sparrow.</td>
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<td>- Arable cultivation accounts for 83 per cent of land cover as the deposits of glacial till and alluvium, which cloak the underlying Chalk strata have created rich soils. Holderness is a producer of cereals and root crops, with pigs, notably within the lower reaches of the Hull Valley. Forty two per cent of the land is Grade 2 and 50 per cent is Grade 3.</td>
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<td>An open landscape of low-lying, predominantly flat or gently undulating rural land, sloping gently eastwards towards the North Sea. Sea views along the eastern fringes and long, open rural views over the area from the Wolds to the north and west.</td>
</tr>
<tr>
<td>- Strong visual links between the chalk ridge of the Wolds and the Holderness plateau.</td>
</tr>
<tr>
<td>- Sparse tree and woodland cover create a generally open landscape with long views.</td>
</tr>
<tr>
<td>- The inland, agricultural landscape is separated from the coast.</td>
</tr>
<tr>
<td>- Coastal views include a long stretch of rapidly-eroding, soft clay cliffs with views of Flamborough, chalk headland in the north.</td>
</tr>
<tr>
<td>- Along some parts of the coast, views of the gently undulating land towards the coastal strip is also characterised by arable farmland, wind-pruned trees, holiday homes and caravan parks.</td>
</tr>
<tr>
<td>Strong sense of rural character in remote areas of arable farmland, dispersed villages and hamlets linked by minor roads and lanes. Towns and villages located along the coastline and the larger settlements of Bridlington, Driffield and Beverley provide more urban character, as do the outskirts of Hull.</td>
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<tr>
<td>- Local vernacular characterised by red brick and pantiles, and buildings towards the coastline constructed from Holderness 'cobbles'.</td>
</tr>
<tr>
<td>- Church spires from towns and villages are prominent in the flat landscape including views of Beverley Minster.</td>
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<tr>
<td>- Some villages and hamlets are designated as Conservation Areas.</td>
</tr>
<tr>
<td>- The distinctive market town of Beverley has historic character and a medieval minster.</td>
</tr>
<tr>
<td>- Coastal character in resorts such as Bridlington, Hornsea and Withernsea.</td>
</tr>
<tr>
<td>- Expansion of road, retail and housing development outside the larger settlements of Bridlington, Driffield and Beverley.</td>
</tr>
</tbody>
</table>
### Landscape attribute

#### Limited network of public rights of way and very little open access land so that access for recreation from urban areas to the countryside and coast is poor.

- Green infrastructure strategies, development of coastal access and new links to existing rights of way.
- Hull to Hornsea disused railway line is a strategic route (part of the Trans Pennine Trail) and potentially provides wildlife corridors linking to semi-natural habitats.
- The coastal town of Bridlington ranks as one of the worst areas experiencing multiple deprivation.
- Short stretch of the national cycle route, the 'Way of the Roses', runs through the adjoining Yorkshire Wolds into Beverley and a 80 km long distance walking route, 'The Minster Way', runs between York and Beverley minsters.
- Coastal access is fragmented in some areas due to coastal erosion and extensive caravan parks.
- Rural lanes linking villages provide quiet rural routes which are popular for cycling, horse riding and walking.

#### Land gently undulating eastwards towards the sea where the coastal strip from Withernsea in the south, past Hornsea to Bridlington in the north, is characterised by arable farmland, sparse tree cover, holiday homes and caravan parks, and some historical sites.

- Prominent seaside resorts of Bridlington, Hornsea and Withernsea with static caravan parks.
- Historic coastline with visible evidence of military sea defences dating from the First and Second World Wars.
- Dimlington gas pipelines are large structures extending offshore and may impede coastal processes (erosion) and impact on sea views.
- Several sites of medieval interest including Meux Abbey, a Cistercian monastery east of Beverley. Along the coast are several deserted medieval villages and a moated motte-and-bailey castle at Skipsea.

#### Sparse woodland cover restricted to a few remaining woodlands linked to ancient forests and small pockets of deciduous woodland and shelter belts.

- Alder and willow carr woodland is the native woodland characteristic of the wetland corridor.
- Low Wood with its extensive alder and willow carr, characteristic of ‘wet’ areas at Hornsea Mere, Bail Wood near Aldbrough and Burton Bushes on Beverley Westwood historic grazing land.
- Copses and woodlands spread through the farmland outside the River Hull valley.

#### Tourism and recreation opportunities related to historic buildings, seaside and art.

- The grand, medieval minster located in the historic town of Beverley was constructed between 1220 and 1425. It inspired the design of Westminster Abbey.
- Burton Constable Elizabethan country house with landscaped gardens designed by Lancelot 'Capability' Brown.
- Popular seaside resorts include Hornsea and Bridlington. The latter is home to renowned artist, David Hockney.
Landscape opportunities

- Manage, enhance and restore the network of riparian and other wetland habitats in the Hull Valley by encouraging land managers to adopt sustainable management interventions and produce good quality habitats that form links between wetlands and other semi-natural habitats such as wet grassland, reedbeds and small-scale woodland or scrub.

- Manage, enhance and restore the network of watercourses in the Hull Valley by working with land managers to improve biodiversity, water quality and reduce flood risk while enhancing these landscape features by creating or maintaining marginal habitats around watercourses and creating buffer strips of wet grassland.

- Conserve and protect the post-glacial remnants of features that would have once been commonplace in a wetter landscape including Hornsea Mere SSSI, by creating and restoring marginal habitats associated the mere and through interpretation and education of geological SSSI for local communities and visitors.

- Plan to allow natural coastal processes to continue in appropriate areas along the Holderness coastline to allow essential sediment transportation to create other intertidal habitats and natural sea defences further south.

- Plan to extend coastal access where feasible by working in partnership including caravan park owners and ensuring provision for roll back so that rights of way are adaptable to the effects of coastal erosion.

- Plan for sea level rise and increased storm events by seeking opportunities to support soft defences such as meres so that they will allow natural coastal processes and enhance the landscape character of the coast.

- Manage, enhance and restore declining farmland features such as grasslands, networks of ditches, small copses and hedgerows, providing roosting and feeding areas for barn owl, corn bunting and tree sparrow, by encouraging the take-up of environmental stewardship options.

- Protect the open, exposed and low-lying landscape in rural areas and on the coast with its long views.

- Manage the historic environment for its contribution to local character and sense of identity and as a framework for habitat restoration and sustainable development.

- Plan opportunities to provide links between the urban settlements in Holderness (including Hull) to the surrounding countryside so that people in urban areas can enjoy the tranquillity of the rural areas, its history and the coast and including development of more green spaces within the towns and cities.

- Protect quiet rural areas by encouraging sensitive development, respecting long and open views, strong rural character of the area and local vernacular.

- Use understanding of the area's traditional and historic architecture and its distinct patterns of settlement, to plan for and inspire any environmentally beneficial new development, which makes a positive contribution to local character and retains key views.
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.

<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
<th>State</th>
<th>Main beneficiary</th>
<th>Analysis</th>
<th>Opportunities</th>
<th>Principal services offered by opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food provision</strong></td>
<td>Root crops, Oil seeds, Vegetables, Livestock (mainly pigs and poultry), Soils, Water</td>
<td>Rich, loamy, clayey soils support intensive arable cultivation. 42 per cent of the NCA is Grade 2 agricultural land, mainly on the lower slopes near the adjoining Yorkshire Wolds along the western edge of the NCA and on the slightly raised land especially in the south-east of the NCA extending towards the North Sea coast.</td>
<td>Regional</td>
<td>Food provision is an important service but commercial scale arable cultivation, pig production and free-range poultry may be making a significant contribution to a loss of water quality due to diffuse pollution. Although there may be scope for increasing food provision, issues around water quality, soil erosion and flooding provide limitations. Extensive arable land and lack of/fragmented semi-natural habitats reduce the range of nectar sources for pollinating insects.</td>
<td>Encourage sustainable farming practices to reduce the impact on water and soil quality while providing opportunities for biodiversity and pollination by promoting compliance with nitrate vulnerable zones (NVZ) to reduce the impact on soil and water quality. Ensure the waste of pig and poultry units is managed to avoid impacting on water quality.</td>
<td>Food provision, Regulating water quality, Water availability, Biodiversity, Climate regulation, Regulating soil erosion, Regulating soil quality, Sense of place / inspiration</td>
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</table>
## 40. Holderness

### Food provision cont.

<table>
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<tr>
<th>Service</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Food provision cont.</td>
<td>... continued from previous page</td>
<td>Over 81 per cent of the NCA is farmed. Over 55 per cent of the farmed area is arable but along the lower reaches of the valley north of Hull, drainage enables cultivation of vegetables and root crops comprising 5 per cent. The largest numbers of livestock are pigs and recently, there is growing demand for poultry holdings.</td>
<td></td>
<td></td>
<td>Support the creation and restoration of habitats that provide a network of nectar sources such as hedgerows, species-rich grassland, carr and wet woodland.</td>
</tr>
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</table>

### Timber provision

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<thead>
<tr>
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<tbody>
<tr>
<td>Timber provision</td>
<td>There is very limited scope for commercial timber production. Woodland only covers 1 per cent of the NCA. Sparse woodland cover is due to woodland clearance and drainage for crop cultivation. Some scattered woodland blocks occur as do shelterbelts around farmsteads. There are few areas of ancient woodland linked to ancient forests mainly Hornsea Mere, Bail Wood near Aldbrough and Burton Bushes on Beverley Westwood.</td>
<td>Local</td>
<td>New woodland planting should occur where this does not restrict long and open views. There may be potential for woodland planting to reduce flood flows downstream.</td>
<td>Seek opportunities to bring appropriate woodlands into management to produce timber. Explore opportunities to maintain ancient woodlands such as Low Wood near Hornsea Mere, Bail Wood near Aldbrough and Burton Bushes near Beverley. Explore opportunities to plant woodlands alongside watercourses and in flood plains, to increase surface roughness and slow flood flows where this does not affect areas where there are long and open views.</td>
<td>Timber provision Climate regulation Regulating soil erosion Regulating water flow Regulating water quality Regulating water flow Biodiversity</td>
</tr>
</tbody>
</table>
## 40. Holderness

### National Character Area profile:

### Introduction & Summary

### Description

### Opportunities

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<tbody>
<tr>
<td>Water availability</td>
<td>Chalk aquifer&lt;br&gt;Network of watercourses including River Hull, Kelk Beck, Holderness Drain and Leven Canal&lt;br&gt;Semi-natural habitats</td>
<td>A major chalk aquifer underlies Holderness and Yorkshire Wolds NCAs, supplying water to the region for industry, agriculture and drinking. It also helps to form the base flow of the River Hull and its headwaters.&lt;br&gt;Two water storage reservoirs are located at Tophill Low pumping station.</td>
<td>Regional</td>
<td>The majority of the chalk aquifer (which also underlies the adjoining Yorkshire Wolds NCA), is classified as no water available, with part of the north-eastern area of the Chalk being over-licensed. In the Hull area in the Humber Estuary NCA, but also straddling Holderness, no consumptive abstractions* are granted in order to prevent saline intrusion.&lt;br&gt;The upper reaches of the River Hull, from its headwaters at Driffield to Hempholme Weir, is 'over licensed'. Kelk Beck, one of the headwater tributaries to the River Hull running east of Driffield, has &quot;no water available&quot; for additional abstraction.&lt;br&gt;The River Hull headwaters are spring-fed from the chalk aquifer and the Tophill Low reservoirs are filled directly from the river for public water supply.</td>
<td>Work with farmers, landowners and businesses to use and manage water sustainably and encourage adoption of land management practices including creating water storage areas, increase semi-natural habitats for infiltration such as grassland strips along water courses and recreation of flood plain grazing marsh.</td>
</tr>
</tbody>
</table>

| Genetic diversity   | N/A | N/A | N/A | N/A | N/A | N/A |

*Whereby a significant proportion of the water is not returned to the source of supply after use.
### Opportunities

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</thead>
<tbody>
<tr>
<td>Biomass energy</td>
<td>Existing woodland</td>
<td>There is limited scope for biomass production from existing woodlands as coverage is sparse (only 1 per cent of the NCA).</td>
<td>Local</td>
<td>There are limited opportunities for biomass provision by managing existing woodland to provide wood fuel for local boilers.</td>
<td>Ensure appropriate, existing woodlands are managed to produce surplus timber as wood fuel for local use.</td>
<td>Biomass energy</td>
</tr>
<tr>
<td></td>
<td>Miscanthus</td>
<td></td>
<td></td>
<td>There is future potential for increasing biomass crops as the area offers high potential yields for miscanthus and medium potential for short rotation coppice throughout the NCA.</td>
<td>Explore opportunities to increase the growing of miscanthus and short rotation coppice in appropriate areas respecting areas with long and open views.</td>
<td></td>
</tr>
</tbody>
</table>

For information on the potential landscape impacts of biomass plantings within the NCA, refer to [http://archive.defra.gov.uk/foodfarm/growing/crops/industrial/energy/opportunities/index.htm](http://archive.defra.gov.uk/foodfarm/growing/crops/industrial/energy/opportunities/index.htm)
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<tr>
<td>Climate regulation</td>
<td>Flood plain grazing Marsh and woodland Peaty topsoils and loamy, clay soils Marine environment</td>
<td>There is low soil carbon content at (0-5 per cent) throughout most of the NCA, especially where there is extensive, arable cultivation. West of the centre of the NCA, there is a higher carbon content of 10-20 per cent associated with the peaty topsoils, and the loamy and clayey flood plain soils with naturally high groundwater. Semi-natural habitats help to mitigate against climate change, the most extensive in the NCA being flood plain grazing marsh (3,106 ha). Woodland cover is low at 1 per cent of the NCA. A number of off and onshore wind farm proposals are in development as well as a proposed expansion of natural gas storage at Aldborough (including installation of a monopile offshore structure).</td>
<td>Regional</td>
<td>Carbon content/storage may be improved by increasing organic matter content and by reducing the frequency/area of cultivation. It will be important to conserve the more organic-rich, peaty topsoils and loamy, clayey flood plain soils. Carbon storage will be provided by the 3,106 ha of flood plain grazing marsh which store high levels of organic matter, although some of these may be lost through predicted sea level rise. Climate change trends suggest sea level rise and more frequent storm events so that species will need networks of semi-natural habitats and corridors to be able to move in response to those changes. Increased rainfall and water in flood plain meadows could create more wetland habitats thus providing increased opportunities for carbon storage.</td>
<td>Increase opportunities to manage and protect the soil resource by building up organic matter by establishing areas of permanent grassland and other uncultivated land such as semi-natural habitats. Through appropriate environmental stewardship options, maintain, restore and create flood plain grazing marsh, increase areas of permanent grassland and allow inundation of grassland in flood plains where this is feasible. Introduce fallow in rotation and plant green cover crops to reduce nitrate leaching. Adopt cultivation practices that reduce reliance on high levels of fertiliser application and where used, encourage adherence to government guidelines (NVZ regulations). Encourage woodland creation but ensure woodland planting is sensitive to the potential impacts on areas where there are long, open views.</td>
<td>Climate regulation Regulating soil quality Regulating soil erosion Regulating water quality Water availability Biodiversity Timber provision</td>
</tr>
</tbody>
</table>
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<td>Climate regulation cont.</td>
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<td></td>
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<td></td>
<td>The very low woodland cover (1 per cent) makes a limited contribution.</td>
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<td></td>
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<td></td>
<td></td>
<td>The installation of off-shore wind turbines and gas pipelines in the marine environment should be carefully managed to avoid disturbance to marine life and coastal processes.</td>
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<tr>
<td>Regulating water quality</td>
<td>High nitrate levels are found in the chalk aquifer which also includes the adjoining Yorkshire Wolds NCA. The springs emerge that feed into the River Hull in Holderness. Since 2003, the Water Framework Directive has been established. Semi-natural habitats are found in Holderness, including the Yorkshire Wolds NCA.</td>
<td>Regional</td>
<td>Diffuse nitrate pollution occurs in the adjoining Yorkshire Wolds NCA and affects watercourses in Holderness, the latter of which falls within the ‘East Riding of Yorkshire Priority Catchment’ and are noted to be failing river quality due to eutrophication. All surface waters contain high levels of phosphate and most rivers suffer from high nitrates and pesticides. This is also exacerbated by physical modifications for land drainage. In addition to diffuse pollution from excessive sediments from agriculture, other sources include sewage. Without mains drainage, there is potential for private sewage disposal systems to enter watercourses. Within agricultural areas, measures can be taken to reduce nutrient and sediment runoff. Establishing permanent grass to act as a buffer along watercourses.</td>
<td>Encourage land managers to develop good agricultural practices by working with them on nutrient management planning, precision farming, NVZ updates and providing one-to-one training. Plant winter cover crops, in-field grass areas to reduce soil run-off, permanent grassland with low inputs and grass buffer strips on land adjacent to watercourses to reduce nutrient run-off and aid water infiltration. Bathing water quality should be maintained through partnership work involving the Environment Agency, Yorkshire Water, and local authorities aiming to maintain excellent water quality and investigating sources of pollution to afford effective solutions. Explore ways of reducing nutrient inputs into Hornsea Mere such as creating/ managing reedbeds and supporting measures to improve small private discharges where private sewage disposal contributes to poor water quality. Through landscape-scale partnerships, undertaking joint initiatives in the adjoining Yorkshire Wolds and River Hull Valley by working with landowners, farmers and other businesses to protect the water quality and supply of groundwater.</td>
<td></td>
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<td></td>
<td>Hornsea Mere SSSI suffers from eutrophication. A sluice regulating the outfall from Hornsea Mere regulates overflows to the receiving watercourse (Stream Dyke) and also drains an outlying area of Hornsea. Bathing waters along the Holderness coastline are of a high standard with the main resorts Hornsea, Withernsea, and Bridlington North Bay, holding ‘Keep Britain Tidy’ Blue Flag awards (2012).</td>
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### 40. Holderness

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</thead>
<tbody>
<tr>
<td>Regulating water flow</td>
<td>Groundwater flooding can last for several months once levels have risen.</td>
<td>Regional</td>
<td>Flooding from the River Hull and tidal influences on the water courses puts properties, businesses and infrastructure at risk, particularly around Beverley, and further south in Hull and the Humber Estuary.</td>
<td>Identify areas where there is an opportunity for attenuation to reduce water levels during flood events.</td>
<td>Regulating water flow</td>
</tr>
<tr>
<td></td>
<td>Flow patterns of the River Hull, which is tidal in its lower reaches, are affected by river profile, dredging, habitat make-up, sedimentation from agriculture and installation of structures such as weirs and locks.</td>
<td></td>
<td>Accumulatively, issues affecting flow patterns could discourage fish populations to thrive by affecting fish habitats or by directly impeding fish passage further upstream.</td>
<td>Protect undeveloped flood plains from inappropriate development to manage future flood risk adequately.</td>
<td>Regulating coastal erosion</td>
</tr>
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<td></td>
<td>In some low-lying areas in the Hull valley, agricultural productivity is dependent on a system of pumped drainage in an otherwise naturally waterlogged area. Drainage of the low-lying farmland has enabled the fertile alluvial soil to be cultivated and arable crops became the predominant land use.</td>
<td></td>
<td>Regular flooding is likely to affect agriculture and may result in the introduction of new crops or livestock that are more adaptable to flood prone areas.</td>
<td>Adopt farming practices that are adaptable to conditions where flooding is unavoidable and/or managed as part of an agreed flood management strategy, for example grazing with suitable livestock and the creation of more permanent grassland.</td>
<td>Biodiversity</td>
</tr>
<tr>
<td></td>
<td>Flooding is primarily a threat through tidal locking of the River Hull and of the numerous drains which cross the area. This is particularly relevant when water is unable to drain into the Humber Estuary during high tides and inland from surface water due to the low-lying topography.</td>
<td></td>
<td>Management of flood risk in the NCA is constantly assessed which may lead to some pumping stations being categorised as uneconomic and this may also impact on agriculture. Funding mechanisms for capital schemes are available but will require partnership working with a range of organisations and land managers to manage flood risk effectively.</td>
<td>Manage the network of ditches and drains to ensure that whilst operating effectively to drain the land, they also make a positive contribution to biodiversity and landscape character and act as links between other semi-natural habitats.</td>
<td>Regulating water quality</td>
</tr>
<tr>
<td></td>
<td>Continued on next page...</td>
<td></td>
<td></td>
<td></td>
<td>Food production</td>
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</tbody>
</table>

**Supporting documents**

- **National Character**
  - **Area profile:**
    - **Key facts and data:**
      - **Introduction & Summary**
      - **Opportunities**
      - **Landscape change**
      - **Analysis**
### 40. Holderness

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</thead>
<tbody>
<tr>
<td>Regulating water flow cont.</td>
<td>... continued from previous page</td>
<td></td>
<td>In the Eastern Drains, the height of the tide is important in understanding the level and duration of flooding in the area, as this determines the impact of tidal locking on surrounding land and properties. In the future, rising sea levels will result in rivers and drains being tide locked for a longer duration and therefore needs to be considered within the flood risk management strategy. Woodland planting alongside watercourses in flood plains may help to reduce flood flows.</td>
<td>Support the alignment of the flood risk management strategy and shoreline management plan taking a long-term approach to flood risk management. Explore opportunities to plant woodlands alongside watercourses and in flood plains, to reduce flood flows downstream, where this does not affect areas where there are long and open views. Explore opportunities to expand or create flood storage areas where appropriate.</td>
</tr>
</tbody>
</table>

Mappleton and the gas terminal at Easington (in adjoining Humber Estuary NCA) are defended from coastal erosion and flooding.
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</thead>
<tbody>
<tr>
<td>Regulating soil quality</td>
<td>Soils</td>
<td>The slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils (48 per cent of the NCA) may suffer compaction and/or capping as they are easily damaged when wet. In turn this may lead to increasingly poor water infiltration affecting water quality and leading to diffuse pollution as a result of surface water run-off. The slightly acid, loamy and clayey soils with impeded drainage (24 per cent of the NCA) are easily poached by livestock and compacted by machinery when the soil is wet.</td>
<td>National</td>
<td>Management measures on cultivated land that increase organic matter content can help reduce compaction and capping by improving soil structure and water infiltration. To avoid damage of weak topsoil structures from machinery and poaching by livestock, use of machinery for land management activities should be carefully timed and extensive grazing regimes considered.</td>
<td>Increase organic content of soils by introducing fallow into rotations, conversion to grassland and avoiding overstocking or using machinery when it would lead to the compaction of vulnerable soils. Encourage carefully timed activities such as avoiding use of farm machinery, during very wet periods. Take up of extensive grazing regimes will reduce soil compaction.</td>
<td>Regulating soil quality</td>
</tr>
<tr>
<td></td>
<td>Sustainable farming practices</td>
<td></td>
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<td></td>
<td>Food provision</td>
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<td>Regulating soil erosion</td>
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<td></td>
<td>Climate regulation</td>
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<td>Regulating water flow</td>
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<td>Regulating water quality</td>
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<td></td>
<td></td>
<td>Biodiversity</td>
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<td>--------------------------------------------</td>
</tr>
<tr>
<td>Regulating soil erosion</td>
<td>Loamy and clayey soils</td>
<td>The soils across 60% of this NCA are not subject to soil erosion</td>
<td>Regional</td>
<td>Many of the slightly acid loamy and clayey soils with impeded drainage and the freely draining, slightly acid but base-rich soils are prone to capping/slaking and are easily compacted by machinery or livestock if accessed when wet, it increases the risk of soil erosion by surface water run-off. The entire NCA lies within Defra’s ‘East Riding of Yorkshire and North Lincolnshire’ priority catchment but soil erosion is not generally identified as a problem. However, a priority is to reduce sedimentation of watercourses as a result of soil erosion caused by grazing animals having access to stream banks, in the headwaters of the River Hull.</td>
<td>Increase organic matter content to improve soil structure by growing green cover crops or converting to grassland. Create buffer strips of permanent grassland alongside watercourses to reduce sediment run-off. Ensure well-timed cultivations (early autumn) and access onto land by machinery and stock to prevent compaction and poaching. Employ minimum tillage methods such as direct drilling to avoid damage to soil structure. Through the Catchment Sensitive Farming Scheme, work with farmers on nutrient management planning, precision farming, NVZ updates and one-to-one training. Encourage extensive grazing regimes to reduce poaching, ensure animal feeding areas are carefully placed to avoid pollution of watercourses.</td>
<td>Food provision, Regulating soil erosion, Regulating soil quality, Climate regulation, Regulating water flow, Regulating water quality, Biodiversity</td>
</tr>
<tr>
<td></td>
<td>Loamy and sandy soils with peaty surface</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Semi-natural habitats</td>
<td></td>
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</tr>
</tbody>
</table>

National Character Area profile:

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Supporting documents

Food provision

Regulating soil erosion

Regulating soil quality

Climate regulation

Regulating water flow

Regulating water quality

Biodiversity

Increase organic matter content to improve soil structure by growing green cover crops or converting to grassland.
Create buffer strips of permanent grassland alongside watercourses to reduce sediment run-off.
Ensure well-timed cultivations (early autumn) and access onto land by machinery and stock to prevent compaction and poaching. Employ minimum tillage methods such as direct drilling to avoid damage to soil structure.
Through the Catchment Sensitive Farming Scheme, work with farmers on nutrient management planning, precision farming, NVZ updates and one-to-one training.
Encourage extensive grazing regimes to reduce poaching, ensure animal feeding areas are carefully placed to avoid pollution of watercourses.
### 40. Holderness

#### National Character Area profile:

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<tbody>
<tr>
<td>Pollination</td>
<td>Flood plain grazing marsh</td>
<td>Semi-natural vegetation is fragmented due to land drainage and the predominance of arable farming with its large field patterns bounded largely by drainage ditches, (particularly on the River Hull flood plain).</td>
<td>Local</td>
<td>Pollinating insects are supported by a range of semi-natural habitats, in particular species-rich grassland which are few in the NCA, however, flood plain grazing marsh is the most extensive semi-natural habitat and should be restored and maintained.</td>
<td>Create, restore and maintain semi-natural habitats such as flood plain grazing marsh, coastal grassland and hedgerows. Encourage sustainable farming practices such as uncropped field margins and planting of pollen and nectar mixes that will also enhance landscape character and increase landscape connectivity.</td>
<td>Pollination, Food production, Pest regulation, Biodiversity, Sense of place / inspiration</td>
</tr>
<tr>
<td></td>
<td>Hedgerows</td>
<td>Hedgerows are generally found on higher ground but the most extensive semi-natural habitat and nectar source is flood plain grazing marsh which covers 3,106 ha.</td>
<td></td>
<td>Sensitive management of hedges and verges to allow plants to flower and improve availability to pollinators.</td>
<td>Carefully time the management of boundary features and roadside verges to extend flowering time.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Riparian grassland</td>
<td></td>
<td></td>
<td>There are potential nectar sources from the marginal riparian habitats along the canals, rivers and other waterways and in the small areas of ancient woodland near Hornsea Mere, Aldbrough and Burton Bushes (Beverley).</td>
<td>Encourage partnership working with a range of organisations to manage road side verges so that they produce a range of flowering species and form a network of nectar sources.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ancient woodland</td>
<td></td>
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<tr>
<td></td>
<td>Roadside verges</td>
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<td></td>
<td>Pollinating insects</td>
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Semi-natural vegetation is fragmented due to land drainage and the predominance of arable farming with its large field patterns bounded largely by drainage ditches, (particularly on the River Hull flood plain). Hedgerows are generally found on higher ground but the most extensive semi-natural habitat and nectar source is flood plain grazing marsh which covers 3,106 ha. Pollinating insects are supported by a range of semi-natural habitats, in particular species-rich grassland which are few in the NCA, however, flood plain grazing marsh is the most extensive semi-natural habitat and should be restored and maintained. Sensitive management of hedges and verges to allow plants to flower and improve availability to pollinators. There are potential nectar sources from the marginal riparian habitats along the canals, rivers and other waterways and in the small areas of ancient woodland near Hornsea Mere, Aldbrough and Burton Bushes (Beverley). Create, restore and maintain semi-natural habitats such as flood plain grazing marsh, coastal grassland and hedgerows. Encourage sustainable farming practices such as uncropped field margins and planting of pollen and nectar mixes that will also enhance landscape character and increase landscape connectivity. Carefully time the management of boundary features and roadside verges to extend flowering time. Encourage partnership working with a range of organisations to manage road side verges so that they produce a range of flowering species and form a network of nectar sources.
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<tr>
<td>Pest regulation</td>
<td>Flood plain grazing marsh</td>
<td>A variety of semi natural habitats support populations of pest-regulating species (invertebrates, birds and mammals). In the NCA these are fragmented due to land drainage and the predominance of arable farming with its large field patterns bounded largely by drainage ditches, (particularly on the River Hull flood plain). The extent of species-rich grassland is low but hedgerows are generally found on higher ground, riparian grassland is found along the canals and other waterways and the most extensive semi-natural habitat is flood plain grazing marsh which covers 3,106 ha.</td>
<td>Local</td>
<td>Semi-natural habitats within the NCA are fragmented. The existing field boundary hedgerows are sparse and increasing diversity in species and structure of field margins will increase the ability for these areas to support populations of pest-regulating species.</td>
<td>Encourage sustainable farming practices to manage existing semi-natural habitats and create new areas of habitat; mainly hedgerows, woodlands, flood plain grazing marsh and riparian grassland along waterways. Opportunities to improve the network of semi-natural habitats across the NCA should be sought.</td>
<td>Pest regulation, Food production, Pollination, Biodiversity</td>
</tr>
<tr>
<td>Service</td>
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</tr>
<tr>
<td>Regulating coastal erosion and flooding</td>
<td>Coastal processes (sediment transfer)</td>
<td>The Holderness soft, clay cliffs are eroding rapidly at an average rate of 1.5-2.5 metres per year with generally lower rates of erosion near Bridlington in the north. Holderness is the single most important source of sediment in the southern North Sea. Climate change trends suggest sea level rise and more frequent storm events that may exacerbate coastal erosion and flooding.</td>
<td>Regional</td>
<td>Essential coastal processes occurring on the Holderness coast carry sediment south to the Humber, the Lincolnshire Coast and the Wash, where it feeds beaches and through accretion helps inter-tidal habitats adjust to rising sea-levels. However, hard defences on the coastline interrupt this natural sediment transfer to downdrift coastlines. Where possible, natural processes should be allowed to continue and any modification to sea defences should seek to recognise the importance of naturally eroding cliffs in the NCA in retaining sediment transfer rates. Post-glacial meres on the Holderness coast form low points with peat deposits which are prone to coastal erosion. Where they are associated with watercourses flowing inland, coastal flood defences may be required such as those at Tunstall. Planning policies should advocate coastal adaptation measures and avoid inappropriate developments in flood-prone, vulnerable areas.</td>
<td>Allow natural processes to continue along the frontage as far as possible, maintaining sediment supplies to the coastline further south. Allow beaches/intertidal habitats to build up in front of coastal defences to provide natural flood defences supporting man-made structures. Support planning policies that include coastal adaptation measures and avoidance of development in flood-prone areas.</td>
<td>Regulating coastal erosion and flooding Sense of place / inspiration Biodiversity Geodiversity</td>
</tr>
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40. Holderness

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<tbody>
<tr>
<td>Regulating coastal erosion cont.</td>
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<td>... continued from previous page</td>
<td>Shoreline management policy along this coastline aims to ensure the continued protection from coastal flooding of the towns of Bridlington, Hornsea and Withernsea, while allowing the continuation of natural processes along the remainder of the coast. Long term trends identified in the Shoreline Management Plan predict a slow cliff recession in some areas of Holderness on unprotected cliffs, which may bring conservation opportunities regarding re-naturalisation of the coastal strip.</td>
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### 40. Holderness

#### Sense of place/inspiration

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</thead>
<tbody>
<tr>
<td>Sense of place/inspiration</td>
<td>Flat topography and open views across the sea Low woodland cover</td>
<td>Local</td>
<td>The low-lying, open landscape character means that the sky features strongly in any view accentuated by the windswept nature of the plain and fast-eroding character of the coastline. There are strong visual links between the chalk ridge of the Wolds and the Holderness plateau. Feelings of escapism and tranquility are associated with quiet, undeveloped areas along some parts of the coast, views across Hornsea Mere and long views over the Hull valley to the sea.</td>
<td>Ensure that development respects local settlement patterns, using traditional building materials where possible. Retain long, expansive viewpoints. Maintain and restore village and field ponds as important features in the landscape.</td>
</tr>
</tbody>
</table>

#### Description

- **Introduction & Summary**
- **Analysis**
- **Opportunities**
- **Key facts and data**
- **Landscape change**
- **Supporting documents**

#### Opportunities

- **Principal services offered by opportunities**
  - Sense of place / inspiration
  - Tranquillity
  - Recreation
  - Regulating coastal erosion
  - Biodiversity
  - Geodiversity
  - Sense of history

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**continued on next page...**

- **Local**
  - Open, exposed character due to low-lying coastal topography and absence of vegetation.
  - A number of on and off-shore wind farm proposals are in development.
  - Predominantly flat, open and gently undulating plain centred on the valley of the River Hull with large-scale arable farming and large field patterns bounded by drainage ditches.
  - Eastwards, a long, eroding, clay cliff stretches along the North Sea. Coastal resorts of Bridlington and Hornsea are influenced by holiday homes and caravan parks.
  - A predominantly rural area with dispersed settlements linked by winding roads, and churches often providing important landmarks. Villages are scattered, with buildings grouped around ponds and village greens.
  - **Continued on next page...**
### Sense of place/inspiration cont.

**State**

... continued from previous page

Large, sometimes isolated, farmsteads are commonly located on higher ground. Buildings are largely built of red brick and pantiles except for Holderness beach cobbles along the coast.

There are a number of small field ponds around Hornsea and these are a traditional feature in a number of villages.

**Main beneficiary**

The tradition of brick making in the area contributes to the built character as do the Holderness cobbles.

**Analysis**

Villages often traditional contain village greens and ponds and some carry Conservation Designation Area status.

**Opportunities**

Principal services offered by opportunities
### 40. Holderness

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<tr>
<td>Sense of history</td>
<td>Several mires existed within this landscape, which have now been drained. Large, rectilinear fields typical of 19th century enclosure as well as the drained flood plains. Farmsteads are often large and widely dispersed. Brick and pantiles are the common building material and are of a soft, rich red colour, long and narrow in shape. Medieval settlement sites; Skipsea Castle, Meux Cistercian Abbey and Watton Gilbertine Priory. Along the Holderness coast are many First and Second World War coastal defences. Brick making in England began around Hull and Beverley in the 14th century. Rich, red brick was used for buildings, except in coastal areas where Holderness 'cobble' were commonly used as well as limestone for building churches.</td>
<td>Regional</td>
<td>The glacial features of the past potentially provide the best palaeoenvironmental material within the area of the Humber Wetlands. Characteristic medieval field patterns around settlements and hedgerows along parish boundaries have survived in some areas showing evidence of medieval enclosure. Evidence of early enclosure with regular rectangular hedged fields imposed on a previously open landscape. Straight roads with verges were laid out, and large new farms protected by shelter belts were located away from villages. A number of medieval sites remain along the coast as well as evidence of late 19th and 20th century military defences (pillboxes and beach defence emplacements) which may be at threat from coastal erosion. The use of traditional building materials are reflected in key historic buildings including Beverley Minster in the historic market town of Beverley and Burton Constable Hall (with parkland designed by Lancelot 'Capability' Brown) located north of Sproatley village.</td>
<td>Develop opportunities for research into and interpretation of palaeoenvironmental remains/glacial features in the NCA. Develop visitor opportunities to historic places and towns in the NCA. Develop good quality interpretation/education about habitats, wildlife, geology and history at key sites including working with schools and other educational institutions. Encourage work by local community groups to record evidence of the historic coastal defences. Seek opportunities through grant schemes to enhance and conserve traditional farm buildings, and the use of traditional building materials where appropriate.</td>
<td>Sense of history Sense of place/inspiration Recreation Tranquility Geodiversity</td>
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</table>
### Service: Tranquility

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<tr>
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<tr>
<td>Flat, low-lying topography providing extensive views</td>
<td>Although undisturbed areas remain high, they have declined from 82 per cent in the 1960s to 60 per cent in 2007 according to CPRE intrusion mapping.</td>
<td>Local</td>
<td>The main source of disturbance is associated with the larger settlements and route corridors such as Beverley, Driffield and the outskirts of Hull involving the development of housing, industry, road building and pylons which reduced levels of tranquility. A sense of remoteness characterises stretches of coast inaccessible by car and further inland in the rural areas. This is less evident around Bridlington and Hornsea where there are holiday homes and caravan parks.</td>
<td>Encourage sensitive development respecting long and open viewpoints and strong rural character of the area. Also see opportunities to enhance the sense of place. Minimise light spill, particularly in areas classes as 'undisturbed' on CPRE intrusion maps</td>
</tr>
<tr>
<td>Sparse settlement patterns</td>
<td>Remote areas along some parts the coast and inland in rural areas</td>
<td></td>
<td></td>
<td>Sense of place / inspiration</td>
</tr>
<tr>
<td>Long, distant sea views towards and from the coastline</td>
<td></td>
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<td>Recreation</td>
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**Analysis Opportunities**

- Encourage sensitive development respecting long and open viewpoints and strong rural character of the area. Also see opportunities to enhance the sense of place.
- Minimise light spill, particularly in areas classes as 'undisturbed' on CPRE intrusion maps
## 40. Holderness

### National Character Area profile:

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<tr>
<td>Recreation</td>
<td>Only 0.55 per cent of the area is open access land. There are 627.03 km of rights of way at a density of 0.72 km per km² in the NCA.</td>
<td>Regional</td>
<td>Generally an agricultural area with very limited access to the rural landscape but there may be opportunities to extend access to the coast under the Coastal Access Plan. Where woodland occurs there is often limited public access but west of Beverley, at Beverley Westwood, common grazing land includes mature trees dotted across an open, grazed landscape and Burton Bushes which is a small patch of remnant ancient woodland. The coastline, coastal resorts and historic towns offer recreation opportunities for local communities and visitors. The settlements classified as having a high index of Multiple Deprivation would benefit from improved access to the countryside and urban greenspace. Identify opportunities to create new permissive routes, especially around larger settlements linking with existing rights of way within settlements and into the surrounding countryside and extending coastal access with roll back provision and by working in partnership with others. Incorporate green spaces in new developments, in particular around the urban fringe of Hull and areas within Bridlington and Withernsea. Connect green spaces with semi-natural habitats where possible, providing communities with recreational green space and wildlife corridors. Seek opportunities to increase public accessibility to existing woodlands and identify new community woodland creation schemes. Seek opportunities to provide surfaced paths for use by all levels of ability.</td>
<td>Recreation, Tranquility, Sense of place / inspiration, Sense of history, Biodiversity, Geodiversity</td>
<td></td>
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<tr>
<td>Network of footpaths (0.72 km per km²)</td>
<td>There is poor coastal access around Withernsea and further north. There are few accessible woodlands except for Burton Bushes and around Hornsea Mere and there is common grazing land on Beverley Westwood, Figham and Swinemoor. The outskirts of Hull and Bridlington South have poor access to greenspace and are areas with a high index of multiple deprivation⁴ as well as Withernsea, in the south-east of Holderness. These areas are classified in the 'rural worst' 5-10 per cent and the NCA is generally rural worst at 5 per cent.</td>
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<td>Transpennine Trail</td>
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<td>Seaside resorts and coastline</td>
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<td>Burton Constable Hall</td>
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<td>Beverley and Beverley Minster</td>
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<tr>
<td>Coastal medieval sites and military defences</td>
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<tr>
<td>Burton Bushes/ Beverley Westwood</td>
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⁴ The purpose of the English Indices of Deprivation 2010 is to identify small areas of England which are experiencing multiple aspects of deprivation.
<table>
<thead>
<tr>
<th>Service</th>
<th>State</th>
<th>Main beneficiary</th>
<th>Analysis</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity</td>
<td>Designated nature conservation sites cover less than 1 per cent of the NCA, the largest being Hornsea Mere at 232 ha. Another key SSSI is the headwaters of the River Hull. There are 15 SSSI covering less than 1 per cent of the NCA and only 38 per cent of these are in favourable condition.</td>
<td>International</td>
<td>Improving the biological condition of the designated resource is likely to involve working with farmers and landowners to encourage sustainable land management activities, principally through restoration, maintenance and increase of semi-natural habitats. This will also improve resilience of designated sites to climate change, while addressing issues of water quality and provision and soil condition.</td>
<td>Work with farmers and landowners by encouraging maintenance, restoration and creation of flood plain grazing marsh, broadleaved and yew woodland, lowland grassland meadows and fen around key designated sites.</td>
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<td>Many small ponds are found in and around Hornsea, particularly on the Wassand Estate and generally north-south on Holderness.</td>
<td></td>
<td>Key SSSI include the headwaters of the River Hull forming the most northerly chalk stream system in Britain, and of rich, diverse, ecological value, vulnerable to changes in flow levels and higher incidences of low flow periods.</td>
<td>Work with framers and landowners to adopt management interventions that will protect or improve priority habitats as well as water and soil resources by creating buffer strips of meadow grassland to accommodate habitat change, creating more space for species-rich grassland. Also providing habitats for farmland bird species (grey partridge, skylark, barn owl, corn bunting and tree sparrow, yellowhammer, linnet) by creating in-field nesting habitats, planting bird seed mixtures for spring and winter food and creating a network of insect-rich habitats through arable plants and grassland.</td>
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<td></td>
<td>There are declining farmland features that support farmland birds including winter stubble and uncropped field margins.</td>
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<td>Accumulatively, flow pattern issues could discourage fish populations to thrive by reducing good fish habitats or by directly impeding fish passage further upstream.</td>
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<td>Hornsea Mere SSSI is a surviving example of a glacial lake in what was once a landscape of extensive marshes and lakes found in Holderness. Today, it provides important habitat for huge numbers of wintering wildfowl.</td>
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**Principal services offered by opportunities**

- Biodiversity
- Recreation
- Regulating soil erosion
- Regulating soil quality
- Regulating water quality
- Water availability
- Sense of place / inspiration
- Tranquility
- Climate regulation
### 40. Holderness

#### National Character

**Area profile:**

<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/ attributes: main contributors to service</th>
<th>State</th>
<th>Main beneficiary</th>
<th>Analysis</th>
<th>Opportunities</th>
<th>Principal services offered by opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biodiversity cont.</strong></td>
<td>... continued from previous page Coastal strip of grassland Remnants of species-rich grassland occurring around Hornsea Mere and Lambwath Mere</td>
<td>Recognised as a high priority area for farmland birds, butterflies and bees. There are rare remnants of species-rich grassland occurring around Hornsea and Lambwath Meres, where low-lying, seasonally flooded hay fields are maintained by traditional farming practices.</td>
<td></td>
<td>The network of rivers, ditches and dykes provides an important resource for wildlife as well as connections with other semi-natural habitats. The management of water quality, particularly from diffuse pollution is essential in order to prevent degradation of watercourses particularly when they are designated sites. Small ponds often originate from kettle-holes and depressions in the generally flat land separating the moraine ridges that run north-south. Small field and village ponds are also a notable landscape feature throughout the NCA helping to create stepping stones to link with other semi-natural habitats. Where areas of species-rich grassland occur, they should be protected and maintained.</td>
<td>Seek opportunities to maintain and restore ponds for their contribution to biodiversity and as a key landscape feature that enhances landscape character. Support traditional farming practices in areas where there are species-rich grassland such as aftermath grazing for lowland hay meadows.</td>
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<tr>
<td>Service</td>
<td>State</td>
<td>Main beneficiary</td>
<td>Analysis</td>
<td>Opportunities</td>
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<tr>
<td><strong>Geodiversity</strong></td>
<td>Designated geological sites (Dimlington and Flamborough Head Cliffs, Kelsey Hill Gravel Pit, Roos Bog, Skipsea Bail Mere, Skipsea Withow Gap)</td>
<td>Local</td>
<td>These designated, geological sites provide important opportunities for allowing interpretation, understanding and research into geodiversity and key glacial features of the NCA as well as contributing to the sense of place, history and biodiversity in the NCA.</td>
<td>Develop approaches to interpret the glacial features and designated areas to a large audience, showing how they reveal the story of glacial history and landscape change and how they have influenced land use and settlement.</td>
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</table>
Natural England is here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England’s traditional landscapes are safeguarded for future generations.


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The Humber Estuary National Character Area (NCA) focuses on the open and expansive waters of the Humber where it flows into the North Sea and the adjacent low-lying land. Several major rivers flow into the Humber, including the Trent, Don, Aire, Ouse and Hull, thus draining one-fifth of England. This is a low-lying estuarine landscape, with extensive stretches of intertidal habitats including mudflats, salt marsh and reedbeds, coastal dunes and wetlands along the side of the estuary. The estuary is of international significance, as a Ramsar site and is designated as a Special Protection Area for the large flocks of overwintering, migratory and breeding birds. The estuary is also designated as a Special Area of Conservation for its geomorphology and range of intertidal habitats, its lampreys and breeding colonies of grey seals. The area is particularly important for its dynamic geomorphological processes, the most notable of which form the ever-changing, long, remote Spurn peninsula, now designated as Heritage Coast.

The adjacent land has largely been reclaimed, resulting in large fields bounded by ditches, which form high-quality arable cropping land. There is very little woodland in the rural areas, where the many ditches form important networks linking the few other semi-natural habitats.

There are strong contrasts within this landscape. Much of it is open and expansive, with long views and tranquil and remote places, such as Spurn Point, Blacktoft and Skitter Ness, or quiet rural areas dominated by farming. These areas contrast with the large towns such as Hull and Immingham, with the industrial complexes, and with the estuary itself which is a busy trading route.

Key challenges include integrating the development pressures associated with the towns and ports with the protection and enhancement of the landscape and the internationally significant habitats and species. Rising sea levels are another challenge which, when combined with flood flows in the many big rivers that flow into the estuary, can cause major flood events. Addressing the coastal squeeze that is affecting the important intertidal habitats is another challenge, as is understanding and allowing the natural dynamic estuarine processes, in particular those that shape the Spurn peninsula.
Statements of Environmental Opportunity

SEO 1: Protect and enhance the dynamic and inspiring estuarine and coastal landscape with its interrelated habitats of sand dunes, salt marsh, reed beds, saline lagoons and mudflats, extending the internationally important habitats and the wildlife dependent upon them, while addressing coastal squeeze, climate change and dynamic coastal processes.

SEO 2: Encourage a strategic approach to the planning of land uses around the estuary to address the pressures of climate change and development, ensuring that natural processes continue to function, the estuary's biodiversity value is protected and enhanced, and its open and expansive character is retained.

SEO 3: Work with landowners and managers to incorporate more habitats and features into the farmed landscapes that improve biodiversity, address water quality and availability, and contribute to landscape character.

SEO 4: Improve green infrastructure links between urban and rural areas, and seek opportunities for public enjoyment of the open, expansive landscape and its dynamic coastal features and wildlife.

SEO 5: Protect, record and manage the cultural and historic landscape associated with the history of the area as a longstanding key communication and trading route.
Physical and functional links to other National Character Areas

The Humber Estuary is one of Britain's largest estuaries and drains one-fifth of the land mass of England. Several major rivers thus drain into the Humber upstream, including the Don, Aire and Ouse, while the rivers Trent, Hull and Ancholme join the estuary within the area. Actions and measures taken upstream will therefore impact on the estuary, just as high tide levels in the estuary will affect the tidal stretches of the rivers flowing in. Management of the upper stretches of the River Hull (in NCA 40 Holderness) will be key to alleviating flood risk in the city of Hull itself, while the managed realignment of the banks, especially in the upper estuary (in NCA 39 Humberhead Levels), can increase the capacity of the estuary to hold both river and tidal floodwaters.

The estuary forms an important ecological corridor, in particular for salmonids accessing spawning grounds in the Ouse and Trent. It also supports a large grey seal colony at Donna Nook, just down the coast within NCA 42 Lincolnshire Coast and Marshes.

The open water of the estuary has high suspended sediment loads which, as the tides go in and out, feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sand flats, saline lagoons, salt marsh and reedbeds. Sediment from the North Sea and from eroding soft coastlines further up the coast is needed to contribute to the constant reforming of the Spurn peninsula.
There is a major aquifer within the underlying chalk, supplying large urban areas, major industrial complexes and the productive agriculture within both the NCA and adjacent NCAs. The adjacent NCAs—notably Humberhead Levels, Holderness and Lincolnshire Coast and Marshes—also provide important roosting and foraging areas to support the internationally significant bird populations.

The elevated rolling hills of the Yorkshire Wolds to the north and the Lincolnshire Wolds to the south are clearly visible from the low-lying land within the NCA, while also providing expansive views out over the estuary.

The estuary is a very busy waterway, with both passenger and commercial traffic accessing the many ports both within the estuary and upstream. It is thus a key link to north-west Europe. Historically, however, the wide estuary has had limited connections between the north and south sides, but these are now linked by the Humber Bridge.

Distinct areas

Spurn Point, a 5 km long sand and shingle spit.
Key characteristics

- Expansive, flat, low-lying estuarine landscape dominated by the open water of the Humber, with an ever-changing character due to the weather and tides.
- Underlying bedrock of Cretaceous chalk exposed as cliffs where the estuary cuts through between the Yorkshire and Lincolnshire Wolds.
- A predominantly reclaimed, formerly inter-tidal landscape with high-quality soils giving rise to productive arable farming, within large rectilinear fields with boundaries formed by dykes, drains and embankments, and with very little tree cover.
- Large, dispersed farmsteads and small villages on higher land are set within a quiet rural landscape.
- Internationally important estuarine, intertidal and coastal habitats, influenced by the constant processes of accretion and deposition forming mudflats, salt marsh, saline lagoons, sand flats and sand dunes, which support large numbers of breeding and overwintering birds, grey seals and lampreys.
- The unique peninsula of Spurn Point, with its mudflats and sand dunes constantly responding to dynamic coastal processes, provides birdwatching of international interest within a wild and remote landscape.
- Big skies and open views over the estuary, mudflats and salt marshes, where flood embankments allow, with views of extensive industrial installations especially on the south bank.
- Quiet rural areas and the estuary itself contrast distinctly with urban and industrial influences around Hull and around the major ports, especially on the south bank.
The Humber Estuary today

The Humber Estuary is one of the largest river estuaries in Britain. Flowing east, the River Humber is at first constrained by the elevated land of the chalk uplands of the Yorkshire Wolds and Lincolnshire Wolds but then opens up into a wide and expansive stretch of open water before joining the North Sea beyond Spurn Point. High flood banks contain the estuary but the open waters and long views provide the dominant focus within much of the area. On the north bank, there are extensive areas of low-lying flat and productive farmland alongside the urban area of Hull, its major passenger port and its industrial complexes. On the south side, there are further ports and extensive industrial complexes of oil and chemical tanks, towers, chimneys, warehouses and storage areas, with some agricultural land.

The waters of the Humber Estuary contribute to a landscape that is always changing due to the tidal movements, exposing extensive mudflats at low tide, and the effects of the changing weather. Large ships, including ferries, container ships and cargo ships, are constantly moving in and out of the estuary. There are a number of prominent and iconic features in this open estuarine landscape including the Humber Bridge, Hull's tidal surge barrier, The Deep on the water's edge at Hull, and the lighthouses and Vessel Traffic Services control tower on Spurn Point. Some of the finest views of the estuary come from the Humber Bridge which links the north and south banks.

Most of the farmed landscape is open and expansive with large regular fields, large farmsteads with big sheds, few visible field boundaries and very limited tree cover. This is particularly so on the north side, where much of the land has been formed by reclamation of salt marshes from the estuary, by drainage of wet alluvial soils or by the process of ‘warping’; the seasonal tidal impoundment of farmland with water rich in silt. As a result, the farmland is fertile, drained by a network of ditches, and supports productive arable farming.

In other areas, on slightly higher drier land, hedgerows are more frequent and create a slightly more enclosed landscape, but always influenced by the nearby wide expanse of water in the estuary. Here, there are scattered small villages and those traditional buildings remaining are built of soft red brick, produced from local brick works at Beverley to the north and at Barton Clay Pits on the south bank. Some, buildings closer to the coast are traditionally built with cobbles.

Within the predominantly arable farmland, there are areas of saltmarsh and reedbeds along tidal channels which cross the drained marshes, while the Barton Clay Pits provide open water, reedbeds and other wetland habitats, making them of value for birds and other wildlife, such as otters and water voles.

Around Hull, which lies where the River Hull joins the estuary, are varied urban fringe land uses, along with market gardens. The industrial complexes – with their oil and gas refineries, warehouses, towers, chimneys and lighting columns – are a major and distinctive feature of the estuary, especially on the south bank around Immingham and towards Grimsby, and around Hull on the north bank, which also has a passenger port.

These complexes contrast strongly with the remote and distinctive peninsula of Spurn Point, a long sand and shingle spit which extends out across the mouth of the Humber Estuary, providing some shelter from the North Sea. This fragile and mobile landscape is designated a National Nature Reserve. It comprises sandy beaches on the east side, which are exposed to the action of the North Sea, while on the sheltered west side sediment has been deposited, and extensive
mudflats and saltmarshes have developed. The form of the Spurn peninsula responds constantly to wave action and the deposition of sediments brought down from the Holderness coast, and tends to move westwards over time. The peninsula supports colonies of breeding little terns and offers birdwatching experiences of international interest, especially during bird migration.

In the estuary, mudflats cover extensive areas and are exposed at low water. The estuary is also designated a Special Protection Area as it provides significant feeding, roosting and nesting areas for overwintering, migratory and breeding birds; large flocks of waders can often be seen feeding and flying along the shorelines. The estuary regularly supports over 150,000 waterbirds in the non-breeding season, including important populations of golden plover, black-tailed godwit, bar-tailed godwit, ringed plover and lapwing. Other species include wigeon, teal, mallard, shelduck, knot, oystercatcher, avocet, sanderling, dunlin, ruff, curlew, redshank, and turnstone. Bitterns now regularly breed in the reedbeds and marsh harriers hunt overhead. Many of these birds rely upon areas adjacent to this NCA for roosting and feeding.

The estuary is a Ramsar site and Special Area of Conservation, and thus of international importance, for its dynamic coastal and intertidal geomorphological processes and habitats, notably coastal lagoons, fixed dunes, stable dunes, shifting dunes and mudflats and sand flats, and is the third largest Site of Special Scientific Interest in England. It supports both river and sea lamprey, and a large breeding colony of grey seals. It is an important migration route for salmon and sea trout accessing their spawning grounds in the Ouse and Trent. The vegetation is also of interest as several scarce plants occur here at or close to the northern or southern limits of their range on the east coast. Work is being undertaken to address the coastal ‘squeeze’ of intertidal habitats between rising sea levels and flood defences and, in some instances, to increase the capacity of the estuary to hold flood water, through realigning the flood banks, such as at Alkborough.

The elevated chalk ridge that forms the Yorkshire and Lincolnshire Wolds meets the estuary in the west of the NCA, creating low cliffs of geological interest and also providing striking views out over the expanse of water.

The Landscape through time

Some 100,000 years ago the coastline was further west, along the line of the Cretaceous chalk, which forms the raised ridges of the Yorkshire and Lincolnshire Wolds and underlies the rest of the area. During the last ice age, an advancing ice front blocked the mouth of the River Humber, holding back the water to form a huge lake extending inland, the Lake Humber. As the ice retreated, the meltwater poured out over the till (boulder clay), sands and gravels deposited by the ice sheet, cutting a channel to escape out to the sea and forming a wide, shallow river valley.

A moraine ridge, now called the Binks, was deposited seaward of the tip of the Spurn peninsula, creating sheltered conditions thus allowing shingle and sands to settle. Sand dunes formed on these deposits, raising the level above the highest tides and enabling vegetation to encroach, thus creating the peninsula. The peninsula remains in a constant state of flux, responding to wave action and the deposition of sediments, with the southern end protected within the curve of the Binks and the northern end attached to the Holderness coast.

The sea levels rose slowly after the ice age, vast quantities of sand and gravel were pushed onto the coast, and the Humber changed from a river valley to a saltwater estuary. Now the underlying geology is largely obscured by...
the Pleistocene deposits, with cliffs of Cretaceous chalk exposed where the Humber flows between the Yorkshire and Lincolnshire Wolds, forming a flooded valley.

Archaeological evidence shows that the estuary has been a key trade and communication route between the North Sea and the Pennines, and also the Midlands via the Trent, since prehistoric times. Significant palaeoenvironmental and archaeological evidence is preserved within the wetland soils. For instance, bronze-age boats, suitable for both river and sea use, and fishtraps have been discovered in the intertidal areas. There is also evidence of early settlement on higher, drier land, while the lower wetlands provided fishing and fowling as well as summer grazing for the surrounding settlements.

As the northern frontier of the Roman Empire, several Romano-British settlements were established nearby, notably Brough. Place names indicate that both the Saxons and Danes settled in the area. The Humber continued to have great importance for trade and communication, with populations and wealth increasing through the medieval period.

There is evidence on the north bank that some drainage of the marshes began as long ago as 180 AD, and local abbeys began to promote drainage schemes in the 12th century. However, from the 17th century, the processes of coastal reclamation, drainage and enclosure had a significant impact on the rural landscape on the north side of the estuary. Dutch engineers carried out extensive drainage works, including cutting new drainage channels, enlarging watercourses, constructing flood protection berms and installing sluices and pumping systems, thus effectively reclaiming extensive areas from the sea. On the south side, flood defences were built to protect the developing towns and industrial areas.

The practice of warping – flooding areas with tidal waters carrying fertile alluvial silt – was also introduced by the Dutch in the 18th century. Warping drains, with their high flood embankments, are still visible today although the practice has long ceased. Later, Parliamentary enclosures produced the landscape of regular, geometric fields, mostly enclosed by dykes, with associated large brick-built isolated farmsteads, as seen at Sunk Island. Brick pits, based on Pleistocene clays, were excavated at Barton, while shingle was removed from the Spurn peninsula, resulting in increased erosion, which led to the construction of protective groynes, thus affecting the natural processes of accretion and erosion.

Spurn Point, a National Nature Reserve, is a remote spit of land, constantly shifting in response to coastal processes.
In the 20th century, the proximity of deep water enabled the expansion of major cargo ports. The Humber Bridge, built in 1981, finally linked the north and south sides of the estuary.

In the 16th and 17th centuries, the area declined in prosperity as a result of competition for trade and improvements to inland transport systems. Hull, however, prospered and became the principal port and town in the area, with fine municipal architecture built in the 19th century in the town centre. Defensive structures were also constructed from this period onwards to protect the coastline from attack.

The Humber Estuary’s importance for defence continued with a late-19th-century coastal artillery battery and minefield control centre built at Paull Point, followed in the 20th century by a World War I acoustic mirror near Kilnsea and two forts at the estuary mouth, then the construction of World War II anti-aircraft batteries, along with bombing decoys for the main Humber docks at Little Humber. Spurn Point has always been important as a prominent location, with a 19th-century lighthouse and now a tower for the control of vessel movements, a lifeboat station and a bird observatory.

The proximity of deep water, especially on the south side of the estuary, enabled the expansion of several ports which now handle high volumes of goods (approximately 30 per cent of Britain’s shipping tonnage) going both in and out of the country. Immingham has developed as a major container port, as well as importing cars. The associated expansion of industrial complexes, transport links and urban areas has brought with it a loss of tranquillity. The building of motorways and the construction of the Humber Bridge in 1981 have linked the ports and industrial areas with their hinterlands, reducing the separation between the north and south banks and encouraging further development.

The uptake of agri-environment schemes in this area has not been high, with most relating to the management and restoration of wetland habitats such as salt marsh, inter-tidal habitats and reed beds. Farms remain large, averaging 120 ha, and there has been a slight decline in grass area in favour of oilseeds and vegetables. In an area dominated by arable cropping, livestock numbers are low, with a shift from cattle to sheep and a significant reduction in pig numbers, since 2000.
Ecosystem services

The Humber Estuary 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 Humber Estuary NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)
- **Food provision**: With 37 per cent of the land at Grades 1 and 2, and 36 per cent at Grade 3, the area is highly productive. Arable farming is predominant, with high concentrations of cereals and oilseeds. The area is also important for pig rearing. The loamy and clayey soils of the coastal flats with naturally high groundwater have the potential to continue to support highly productive agriculture but this is dependent upon pump drainage and protection from floods. However, over-abstraction is increasing the risk of saline intrusion.

Regulating services (water purification, air quality maintenance and climate regulation)
- **Climate regulation**: Significant carbon storage is provided by extensive areas of saltmarsh, reedbeds, mudflats and coastal marine sediments.

- **Regulating water quality**: Measures to reduce the demand for groundwater within the arable farmland, and thus the risk of saline intrusion, are a priority. The quality of the water within the estuary itself is highly dependent upon the quality of the water of the rivers upstream.

- **Regulating water flow (flooding)**: The entire NCA lies within the ‘floodable area’ of the Humber Estuary, at risk of being flooded by rising sea levels, and in particular by a storm surge in the North Sea combined with high river levels. Reflecting this risk, essentially the entire stretch of the estuarine shore is protected by flood defences. These give rise to ‘coastal squeeze’, as intertidal habitats are lost between rising sea levels and the flood banks, which needs to be addressed by managed realignment to enable the continued expansion of intertidal habitats.

The complex processes of deposition and erosion within the estuary are linked to the coastal processes. Sediments from the North Sea and from the eroding Holderness cliffs to the north are drawn in and out of the estuary and contribute to the continual changing patterns of deposition. In particular, these sediments form the Spurn Head peninsula at the mouth of the estuary which in turn provides shelter, encouraging the accretion of extensive mudflats on the east side. The supply of sediments thus needs to be maintained.

Cultural services (inspiration, education and wellbeing)
- **A sense of place/inspiration**: Sense of place, inspiration and escapism are all provided by the expansive, flat, low-lying estuarine landscape dominated by the Humber, with large open skies, the exposed Spurn peninsula, and remote, quiet wetlands alongside the estuary. The tidal nature of the estuary provides an ever-changing scene, often with large flocks of birds wheeling past, and the Humber Bridge, industrial complexes and other iconic structures forming distinctive focal points.

- **Tranquillity**: There are strong contrasts between the very busy areas of Hull and the industrial complexes along the south bank, and the tranquil areas of the mudflats and estuarine landscape on the north side, and the upper...
stretches of the estuary. Spurn Head retains an ‘other-worldly’ quality, all but cut off from the mainland.

- **Biodiversity:** The Humber Estuary is of international significance, with most of it designated as a Ramsar site and as a Special Area of Conservation for its extensive intertidal habitats such as mudflats, sands, coastal lagoons and sand dunes, and its populations of grey seals and lampreys. It is also a Special Protection Area for its breeding, migratory and overwintering bird populations, and is the third largest Site of Special Scientific Interest in England.

- **Geodiversity:** The Humber Estuary is of international importance for its complex patterns of erosion and accretion, with the Spurn Peninsula an outstanding example of a dynamic spit system, with a long historical map record.
41. Humber Estuary

Statements of Environmental Opportunity

SEO 1: Protect and enhance the dynamic and inspiring estuarine and coastal landscape with its interrelated habitats of sand dunes, saltmarsh, reed beds, saline lagoons and mudflats, extending the internationally important habitats and the wildlife dependent upon them, while addressing coastal squeeze, climate change and dynamic coastal processes.

For example, by:

- Responding to rising sea levels by seeking opportunities to realign flood defences or provide soft flood defences, thus allowing the development of intertidal habitats to compensate for any losses arising from coastal squeeze, maintaining their role in storing carbon and ensuring that new sites are managed to enhance the biodiversity value of the estuary and contribute to its expansive landscape character.
- Seeking opportunities to increase the extent of intertidal habitats— including saltmarsh, reedbeds and mudflats—to provide effective defences against wave energy and to protect and enhance biodiversity value.
- Enabling the natural and dynamic coastal and estuarine processes to continue, so that the coastline and estuary can respond to the constantly changing patterns of accretion and erosion.
- Enabling the Spurn peninsula to evolve as naturally as possible with limited intervention, maintaining access to key facilities with minimal interruption to natural coastal processes.
- Monitoring and researching coastal processes to improve understanding, and working with partners to find ways of enabling these dynamic processes to ensure no net loss of features.
- Providing access to sites of geological or geomorphological interest, and providing interpretation, to raise awareness and improve understanding of the dynamic processes under way.
- Raising awareness of the importance of the roosting and feeding areas for birds around the estuary, ensuring that they are adequately protected and managed.
Encourage a strategic approach to the planning of land uses around the estuary to address the pressures of climate change and development, ensuring that natural processes continue to function, the estuary’s biodiversity value is protected and enhanced, and its open and expansive character is retained.

For example, by:

- Supporting the strategic approach to assimilating new industrial development, in particular on the south bank, to ensure co-ordination of changes so that the internationally significant biodiversity is protected and enhanced.
- Ensuring that compensation and mitigation sites are identified, established and functioning effectively well before development goes ahead, thus ensuring the continuation of resources for wildlife.
- Ensuring that planning decisions adequately address the vital role that areas landward of the flood defences play in supporting the internationally important bird populations, and that new wetlands and grasslands are established to form effective corridors and stepping stone habitats which extend the resources available to wildlife and enable species movement.
- Carefully planning new industrial complexes and structures so that they are integrated into local landscape character, by retaining key views, landscape features and sites of nature conservation value, and creating new habitats such as wetlands and grazing marsh, thus ensuring that industrial areas are more ‘permeable’, with networks of connected habitats.
- Ensuring that light spill is minimised through careful lighting design, particularly in the more tranquil and undisturbed areas.
- Avoiding development in remote and tranquil areas, in particular protecting the remote qualities of Spurn Point Heritage Coast.
41. Humber Estuary

For example, by:

- Encouraging the creation and management of permanent grass field margins and grass buffers to watercourses, thus reducing nutrient and sediment run-off.
- Taking opportunities to link and expand semi-natural habitats, especially grazing marsh and wetlands, thus creating strong habitat networks, providing corridors and stepping stones which will increase resilience to climate change by reducing fragmentation and enabling species movement.
- Encouraging the creation and management of fresh water habitats, wet grasslands and brackish water habitats to extend the areas available as well as compensating for those lost through rising sea levels, to strengthen biodiversity interest, enable species movement and improve infiltration of rain water.
- Conserving the network of drains, ditches and dykes and managing them so that they form effective habitats, encouraging more emergent vegetation and strengthening their contribution in supporting wildlife and as landscape features.

- Manage pumped drainage in such a way as to support the network of ditch habitats and to avoid drawing in saline waters.
- Encouraging selection of crops that will reduce demand for irrigation, and addressing demand for water – for instance through increasing on-farm water storage – thus reducing the risk of saline intrusion into groundwater.
- Encouraging the introduction of grass margins, pollen and nectar strips, and grass buffers along watercourses, to increase sources of support for pollinating insects as well as improving infiltration of rain water.
- Encouraging cultivation practices that will assist with the build-up of organic content of the soils as well as provide habitats for farmland birds and insects, such as including fallow within rotations, over-wintering stubbles, and pollen and nectar strips.
SEO 4: Improve green infrastructure links between urban and rural areas, and seek opportunities for public enjoyment of the open, expansive landscape and its dynamic coastal features and wildlife.

For example, by:

- Incorporating green spaces in new developments – in particular around the urban areas of Hull and Immingham, connecting semi-natural habitats where possible to increase their resilience to climate change impacts, and addressing sustainable drainage, while also improving access to the natural environment for urban populations.
- Identifying opportunities to create new routes, including permissive routes, especially around Hull, linking with green spaces and rights of way within the city and thus enabling the urban population to access the countryside and the country parks.
- Identifying opportunities to create new circular routes or links to existing rights of way, notably the Yorkshire Wolds Way and the Trans Pennine Trail.

- Seeking ways of enabling more people to benefit from the high level of inspiration to be gained from proximity to the Spurn peninsula and open estuary with its long views, wildlife and dynamic geomorphological features, in particular by gaining access to raised flood banks (where this does not disturb important bird populations) and linking to the new coastal access route that will go up to the Humber Bridge.
- Encouraging sustainable recreational and educational access to enable more people to understand and appreciate the Humber Estuary and its landscape, historic interest, wildlife and its functions and dynamic nature, bringing attention to and interpreting the realignment sites.
41. Humber Estuary

SEO 5: Protect, record and manage the cultural and historic landscape associated with the history of the area as a longstanding key communication and trading route.

For example, by:

- Preserving important coastal and intertidal palaeo-environmental and archaeological evidence.
- Protecting significant and iconic historic features, including those relating to the different periods of drainage and the coastal and military defence structures.
- Identifying those historic features that are vulnerable to coastal processes and sea level rise, and ensuring that they are recorded and data is captured.

- Encouraging the use of local materials such as soft red brick, pantiles and Holderness cobbles, in restoring vernacular buildings, traditional farm buildings, water management structures and historic features.
- Managing sites of historic interest, such as drainage structures, the early brick-making and rope-making works, and military defences, and making them accessible to the public where appropriate, so that the role of the area can be understood and enjoyed.
1. Landscape and nature conservation designations

The long spit of land at the mouth of the Humber Estuary is designated as Spurn Head Heritage Coast, covering 342 ha (1% of NCA).

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

<table>
<thead>
<tr>
<th>Tier</th>
<th>Designation</th>
<th>Name</th>
<th>Area (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>Ramsar</td>
<td>Humber Estuary</td>
<td>1,478</td>
<td>5</td>
</tr>
<tr>
<td>European</td>
<td>Special Protection Area (SPA)</td>
<td>Humber Estuary SPA</td>
<td>1,473</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Special Area of Conservation (SAC)</td>
<td>Humber Estuary SAC</td>
<td>1,143</td>
<td>4</td>
</tr>
<tr>
<td>National</td>
<td>National Nature Reserve (NNR)</td>
<td>Spurn Point NNR, Far Ings NNR</td>
<td>162</td>
<td>1</td>
</tr>
<tr>
<td>National</td>
<td>Site of Special Scientific Interest (SSSI)</td>
<td>A total of 3 sites wholly or partly within the NCA</td>
<td>1,542</td>
<td>5</td>
</tr>
</tbody>
</table>

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.

The designations of SPA and SAC largely overlap, and include extensive stretches of open water in the estuary (much of this is below the mean high water mark that denotes the NCA boundary). While physically not within NCA boundaries this is functionally part of the NCA.

There are 62 Local sites in the Humber Estuary covering 540 ha, which is 2% 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](http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm)
- Details of Local Nature Reserves (LNR) can be searched: [http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp](http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp)

### 1.1.1 Condition of designated sites

A breakdown of SSSI condition as of March 2011 is as follows:

<table>
<thead>
<tr>
<th>Condition category</th>
<th>Area in condition (ha)</th>
<th>% of SSSI land in condition category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unfavourable declining</td>
<td>327</td>
<td>21</td>
</tr>
<tr>
<td>Favourable</td>
<td>763</td>
<td>50</td>
</tr>
<tr>
<td>Unfavourable no change</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>Unfavourable recovering</td>
<td>353</td>
<td>23</td>
</tr>
</tbody>
</table>

Source: Natural England (March 2011)

Details of SSSI condition can be searched at: [http://www.sssi.naturalengland.org.uk/Special/sssi/reportIndex.cfm](http://www.sssi.naturalengland.org.uk/Special/sssi/reportIndex.cfm)
2. Landform, geology and soils

2.1 Elevation
This NCA comprises the land on both sides of the wide Humber Estuary, where it flows into the North Sea. It is mostly only a few metres above sea level, rising to a maximum of 65m.

Source: Natural England (2010)

2.2 Landform and process
The area is flat and low-lying, with some small areas of higher land on both sides where the chalk ridge, that forms the Yorkshire Wolds to the north and the Lincolnshire Wolds to the south, cuts across the estuary. The NCA contains the open water of the estuary, which has high suspended sediment loads that feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reed beds.

Source: Humber Estuary Countryside Character description

2.3 Bedrock geology
The underlying bedrock is mainly Cretaceous chalk which forms the ridges of the Yorkshire and Lincolnshire Wolds. These run north south, cutting across the flow of the estuary. However, the chalk is only rarely exposed within the NCA. A breakdown of solid geology as a proportion of total land area is as follows: 86% chalk; 9% mudstone; 2% mudstone, limestone interbedded and 1% ironstone.

Source: Humber Estuary Countryside Character description

2.4 Superficial deposits
There is a constantly changing and dynamic system of accretion and erosion along the coastline, creating intertidal and subtidal mudflats, sandflats, saltmarsh, reed beds within the estuary, and changing deposits and erosion of sand and sand dunes along the North Sea coast. Spurn is an outstanding example of a dynamic spit system, very unusual, if not unique in Europe, in that the massive supply of sediment resulting from the erosion of the Holderness coast to the north has enabled it to extend across the mouth of a macro-tidal estuary. There exists an exceptionally long historical map record and written accounts extending back to the 7th Century A.D. This record indicates that the spit continuously shifts its location in response to dynamic coastal processes, especially the ongoing erosion of the Holderness coast. A short stretch of cliff and foreshore at South Ferriby reveals exposures of Pleistocene sediments – boulder clays interbedded with silts and gravels. Resting on these are sandy chalk gravels of probable fluvo-glacial origin, and interpretation of the succession of these sediments is key to understanding the Late Pleistocene history of the region. Farmland within the character area is mostly reclaimed salt marsh consisting of silts, clays and sand.

Source: Humber Estuary Countryside Character description

2.5 Designated geological sites

<table>
<thead>
<tr>
<th>Designation</th>
<th>Number of sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geological Site of Special Scientific Interest (SSSI)</td>
<td>0</td>
</tr>
<tr>
<td>Mixed Interest SSSIs</td>
<td>2</td>
</tr>
</tbody>
</table>

There are 15 Local Geological Sites within the NCA.

Source: Natural England (2011)

Details of individual Sites of Special Scientific Interest can be searched at: http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm
2.6 Soils and Agricultural Land Classification

Much of the agricultural land has been reclaimed from the estuary, especially to the north. Generally, the agricultural land is of good quality, with some areas of more fertile soils where there are glacial and alluvial drift deposits. The best quality land, grades 1 and 2, is largely on the north side of the estuary, on the reclaimed land, whilst the poorest quality, grade 4, is to be found on Spurn Point.

Source: Natural England (2010)

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

<table>
<thead>
<tr>
<th>Agricultural Land Classification</th>
<th>Area in NCA (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>352</td>
<td>1</td>
</tr>
<tr>
<td>Grade 2</td>
<td>10,102</td>
<td>36</td>
</tr>
<tr>
<td>Grade 3</td>
<td>8,395</td>
<td>30</td>
</tr>
<tr>
<td>Grade 4</td>
<td>347</td>
<td>1</td>
</tr>
<tr>
<td>Grade 5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Non-agricultural</td>
<td>282</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Urban</td>
<td>7,988</td>
<td>28</td>
</tr>
</tbody>
</table>

Source: Natural England (2010)

3. Key water bodies and catchments

3.1 Major rivers/canals

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

<table>
<thead>
<tr>
<th>River Name</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Trent</td>
<td>n/a</td>
</tr>
<tr>
<td>River Ouse</td>
<td>n/a</td>
</tr>
<tr>
<td>River Hull</td>
<td>7</td>
</tr>
<tr>
<td>Holderness Drain</td>
<td>4</td>
</tr>
<tr>
<td>River Freshney</td>
<td>&lt;1</td>
</tr>
<tr>
<td>New River Ancholme</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Old River Ancholme</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Market Weighton Canal</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

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 Humber Estuary flows from west to east, and is the culmination of many large rivers that together drain some 20% of the land area of England into the North Sea. Other watercourses have been constructed to drain the area, or to provide navigable routes for the transfer of goods.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 18,745 ha, 67% of 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.

4. Trees and woodlands

4.1 Total Woodland Cover
The NCA contains just 164 ha of woodland (<1% of the total land area). There are no Ancient Semi-natural Woodlands within this NCA, which reflects the relatively recent reclamation of much of the land, and its use as productive agricultural land.

Source: Natural England (2010)

4.2 Distribution and size of woodland and trees in the landscape
Woodland cover is sparse and confined to just a few small woodlands on higher land on the south side of the estuary, and a few young plantations on the north side, reflecting the relatively recent reclamation of much of the land adjoining the estuary.

Source: Humber Estuary Countryside Character description

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

Source: Humber Estuary Countryside Character description

<table>
<thead>
<tr>
<th>Woodland type</th>
<th>Area in NCA (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadleaved</td>
<td>111</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Coniferous</td>
<td>2</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Mixed</td>
<td>31</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Shrub / young trees</td>
<td>20</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Felled/land for prepared planting</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Natural England (2010)

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

<table>
<thead>
<tr>
<th>Woodland type</th>
<th>Area in NCA (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient semi-natural woodland</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ancient re-planted woodland (PAWS)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>


5. Boundary features and patterns

5.1 Boundary features
Field boundaries are predominantly formed by dykes and drains, sometimes combined with flood embankments, with just a few hedgerows on higher land.

Source: Humber Estuary Countryside Character Area description;
Countryside Quality Counts (2003)
5.2 Field patterns
Fields are generally large and rectilinear, especially in the reclaimed areas on the north side.

Source: Humber Estuary 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
The majority of farms (51 no) are focussed on cereal production, with some general cropping (15 no), and 19 providing grazing for livestock. Whilst there are currently no specialist pig farms, many farms do include pig rearing.

Source: Agricultural Census, DEFRA (2010)

6.2 Farm size
The farms are generally large, with just over 40% over 100 ha in size, and only 9% under 5 ha. Farms over 100 ha account for 87% of the farmed land.

Source: Agricultural Census, DEFRA (2010)

6.3 Farm ownership
2009: Total farm area = 13,634 ha; owned land = 7,591 ha
2000: Total farm area = 14,596 ha; owned land = 7,629 ha

Source: Agricultural Census, DEFRA (2010)

6.4 Land use
Cereal and oilseed rotations dominate this area, with some cash roots, vegetables and other arable crops. Only 16% is under grass or uncropped.

Source: Agricultural Census, DEFRA (2010)

6.5 Livestock numbers
Agriculture is predominantly focussed on cropping, so there are few cattle or sheep. However, pig numbers are fairly high at over 26,000, but this has decreased from nearly 37,000 in 2000.

Source: Agricultural Census, DEFRA (2010)

6.6 Farm labour
Since 2000 the number of salaried managers has doubled to 22, and there has also been an increase in the number of part-time farm workers. There has been a corresponding decrease in the number of principal farmers, full time and casual workers.

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
The Estuary comprises a dynamic and changing system of accreting and eroding intertidal and subtidal mudflats, sandflats and other estuarine features. The estuary is of international importance for its coastal lagoons, fixed, shifting and stable dunes, mudflats and sand flats.

The Estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion along the tidal stretches of the rivers Ouse and Trent.

The Spurn Point peninsula is subject to the processes of erosion and accretion, with exposed sandy shores facing the North Sea to the east, and mudflats and saltmarsh on the sheltered east side.
The disused clay pits at Barton now support open water habitats along with reedbeds and other wetland habitats. There are extensive intertidal reedbeds at the confluence of the Trent and Ouse.

Wetland habitats are developing at Alkborough Flats, where the flood defences were realigned to increase the capacity of the Estuary in extreme flood events. There are a number of other smaller managed realignment sites in the NCA which are developing a range of intertidal habitats, and provide compensation for losses due to coastal squeeze arising from increased sea levels, or as compensation for specific developments.

**7.2 Biodiversity Action Plan (BAP) Priority habitats**

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.

**UK BAP priority habitat**

<table>
<thead>
<tr>
<th>UK BAP priority habitat</th>
<th>Area in NCA (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal floodplain grazing marsh</td>
<td>813</td>
<td>3</td>
</tr>
<tr>
<td>Reedbeds</td>
<td>483</td>
<td>2</td>
</tr>
<tr>
<td>Lowland meadows</td>
<td>233</td>
<td>1</td>
</tr>
<tr>
<td>Fens</td>
<td>213</td>
<td>1</td>
</tr>
<tr>
<td>Saline lagoons</td>
<td>142</td>
<td>1</td>
</tr>
<tr>
<td>Coastal sand dunes</td>
<td>111</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Broadleaved mixed &amp; yew woodland (Broad habitat)</td>
<td>111</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Lowland dry acid grassland</td>
<td>96</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Mudflats</td>
<td>56</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Purple moor-grass &amp; rush pastures</td>
<td>17</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Maritime cliff and slope</td>
<td>11</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

**Source: Humber Estuary Natural Area Profile**

Note that the boundary of the NCA is the mean high water mark and thus open water and marine areas are not included.


**7.3 Key species and assemblages of species**


- Maps showing locations of 541 species are available at: [http://data.nbn.org.uk/](http://data.nbn.org.uk/)
8. Settlement and development patterns

8.1 Settlement pattern
The area is dominated by the large conurbation of Kingston upon Hull on the north bank, and the town and extensive industrial areas of Immingham and Immingham Docks on the south bank. These built up areas contrast with the sparsely populated rural areas especially on the relatively recently reclaimed land on the north bank, where there are scattered hamlets and small towns such as Easington and Kilnsea on slightly higher, drier land. The settlements of Hessle (on the north side) and Barton (on the south side) are linked by the Humber Bridge.

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

8.2 Main settlements
The Main towns within the NCA are: Kingston upon Hull, Immingham and Barton. The total estimated population for this NCA (derived from ONS 2001 census data) is: 274,567.

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

8.3 Local vernacular & building materials
The most obvious structures within the NCA are the Humber Bridge and the extensive industrial installations near Hull and around Immingham. Those traditional buildings that do occur are built of soft red brick with red pantiles, sometimes including cobbles near the coast. Nearby Beverley, and Barton on the south bank were the home of the early English brick making industry. Along the coast there are distinctive structures including lighthouses, concrete sea defences and the Vessel Traffic Services tower on Spurn Point.

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

9. Key historic sites and features

9.1 Origin of historic features
Evidence of Humber being used as a key communication route since the Bronze Age, with for example a boat excavated at Ferriby that was suitable for coastal as well as inland transportation. Early settlements were located on slightly higher drier land, using the marshes for fishing, fowling and summer grazing. There is evidence of drainage undertaken in Roman times, but the main activity occurred from the 17th century, with Dutch engineers assisting with cutting drainage channels and installing sluice and pumping systems. The practice of warping – flooding areas with tidal waters carrying fertile alluvial silt – brought low lying areas into cultivation, and warping drains still remain as a feature in the landscape. Hull expanded as a port from the 12th century, with major expansion in 19th century, along with other major ports developing on the south bank. Several features linked to coastal defence remain, with late 19th century coastal artillery battery and minefield control centre at Paull Point, World War 1 acoustic mirror near Kilnsea Grange, and World War 2 gun sites facing the Humber. There is a lighthouse and a traffic control tower on Spurn Point.

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

9.2 Designated historic assets
This NCA has the following historic designations:
- 2 Registered Parks and Gardens covering 58 ha
- 0 Registered Battlefield/s covering 0 ha
- 25 Scheduled Monuments
- 620 Listed Buildings

Source: Natural England (2010)
10. Recreation and access

10.1 Public access

- 1% of the NCA 295 ha is classified as being publically accessible.
- One resource is the Country Parks which comprise 73 ha, while 161 ha of National Nature Reserve and 72 ha of Local Nature Reserves are accessible.
- There are 216 km of public rights of way at a density of 0.8km per km².
- There are 0 National Trails with the Humber Estuary NCA. However, the Wolds way starts on the north bank, and just over 4 km falls within this NCA.

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

<table>
<thead>
<tr>
<th>Access designation</th>
<th>Area in NCA (ha)</th>
<th>% of NCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Trust (Accessible all year)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Common Land</td>
<td>415</td>
<td>2</td>
</tr>
<tr>
<td>Country Parks</td>
<td>73</td>
<td>&lt;1</td>
</tr>
<tr>
<td>CROW Access Land (Section 4 and 16)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CROW Section 15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Village Greens</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Doorstep Greens</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Forestry Commission Walkers Welcome Grants</td>
<td>32</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Local Nature Reserves (LNR)</td>
<td>72</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Millennium Greens</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Accessible National Nature Reserves (NNR)</td>
<td>160</td>
<td>1</td>
</tr>
<tr>
<td>Agri-environment Scheme Access</td>
<td>12</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Woods for People</td>
<td>42</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

Sources: Natural England (2010)

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) the least tranquil areas are, unsurprisingly, the city of Hull on the north bank, and Immingham and the industrial areas on the south bank, while the agricultural land on the north side, some stretches of the estuary and Spurn Point are all very tranquil.

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

<table>
<thead>
<tr>
<th>Tranquillity</th>
<th>Tranquillity Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest value within NCA</td>
<td>107</td>
</tr>
<tr>
<td>Lowest value within NCA</td>
<td>-89</td>
</tr>
<tr>
<td>Mean value within NCA</td>
<td>-7</td>
</tr>
</tbody>
</table>

Sources: CPRE (2006)
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 the city of Hull and the roads and industrial complexes around it are the most disturbed. A breakdown of intrusion values for this NCA are detailed in the table below.

<table>
<thead>
<tr>
<th>Intrusion category</th>
<th>1960s (%)</th>
<th>1990s (%)</th>
<th>2007 (%)</th>
<th>Percent-age change (1960s-2007)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disturbed</td>
<td>20</td>
<td>27</td>
<td>25</td>
<td>+6</td>
</tr>
<tr>
<td>Undisturbed</td>
<td>55</td>
<td>44</td>
<td>46</td>
<td>-9</td>
</tr>
<tr>
<td>Urban</td>
<td>18</td>
<td>18</td>
<td>29</td>
<td>+11</td>
</tr>
</tbody>
</table>

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are the increase in disturbed areas, which are the urban areas and industrial complexes around Grimsby, Immingham and the south bank. Dark night skies are affected by the urban areas, but also particularly by the large scale lighting of the industrial complexes, which make them into intrusive yet striking features when viewed across the waters of the Estuary.

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

- Joint Character Area GIS boundaries, Natural England (data created 2001)
- National Parks and AONBs GIS boundaries, Natural England (2006)
- Countryside Quality Counts Draft Historic Profiles, English Heritage (2004)*
- BAP Priority Habitats GIS data, Natural England (March 2011)
- Special Areas of Conservation data, Natural England (data accessed in March 2011)
- Special Protection Areas data, Natural England (data accessed in March 2011)
- Ramsar sites data, Natural England (data accessed in March 2011)
- Sites of Special Scientific Interest, Natural England (data accessed in March 2011)

- Source protection zones, Environment Agency (2005)
- 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)

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 and trends

**Trees and woodlands**
- There is insignificant woodland cover, and there has been little recent change.

**Boundary features**
- Data from Countryside Quality Counts for the period 1999 to 2003 indicates that boundary features (notably ditches) have generally been neglected, with only 3% of the total resources covered in a limited uptake of agri-environment agreements.
- However, some 7 km of ditches and 6.6 km of hedges are under Environmental Stewardship agreements, as at March 2011.

**Agriculture**
- Rotations of cereals and oilseeds continue to dominate the agricultural production, with a decline of mixed and general cropping, a drop in pig numbers and a slight increase in larger farms since c.2000.

**Settlement and development**
- During the period 1999 to 2003 there was a moderately high rate of change arising from development, with some evidence of expansion of urban areas and industrial sites, especially around Immingham, Brough, Elloughton and Welton.
- Since 2003, industry and port development has continued to expand on both the south and north banks, including recent applications for extension of port handling and storage, and sites for turbine construction to supply off-shore windfarms.
- There has been a reduction in the extent of undisturbed land since the 1960s, due to the increase in urban areas and industrial complexes, in particular around Immingham.

**Semi-natural habitat**
- Between 1999 and 2003 the annual uptake of agri-environment agreements was low, with the most extensive uptakes in 2003 relating to the conservation of salt marsh, over-wintered stubble and spring / summer fallow.
- The managed re-alignment scheme at Alkborough Flats has resulted in an increase in wet pasture, reedbeds and open water.

**Historic features**
- It is estimated that 75% of historic farm buildings remain unconverted, and approximately 85% are intact structurally.

**Coast and rivers**
- In 2003 there were some agri-environment agreements related to the management and restoration of wetland habitats such as salt marsh, intertidal habitats, reed beds and conversion of sand dunes. The biological water quality in 1995 was predominantly good and was maintained as such. The chemical water quality in 1995 was predominantly poor, and remained unchanged.
The capacity of the estuary to hold floodwaters has been increased recently by managed realignment schemes, notably the reversion of farmland at Alkborough to wet pasture, reedbeds and open water.

There is a constantly changing and dynamic system of accretion and erosion along the coastline, creating intertidal and subtidal mudflats, sandflats and saltmarsh within the estuary, and changing deposition and erosion of sand and sand dunes along the North Sea coast. This is most marked with the constantly shifting form of the Spurn peninsula.

Minerals
Clay has historically been extracted at Barton Pits, and there are some cement works on the south side, but otherwise there is no significant extraction of minerals in this NCA.

Drivers, future challenges and opportunities

Climate change
Climate change is likely to result in:
- More extreme weather events, in particular storm surges leading to increased flooding, both from higher tides and increased flood flows down the several rivers feeding into the estuary, increasing flood risk for adjacent land and causing significant alterations to patterns of erosion and deposition.
- Rise in sea levels, which when combined with the existing flood defences, will result in the further loss of intertidal habitats and other habitats such as reedbeds, floodplain grazing marsh, brackish and fresh water.

The possibility of subsequent changes to erosion and accretion of sediments, due to the rise in sea levels, resulting in significant changes in the form of the Spurn peninsula.

Changes in coastal habitats may affect feeding opportunities for birds.

A longer growing season potentially leading to double cropping and warmer winters leading to new crops.

Increasing demands for water, for both domestic use and irrigation, leading to possible depletion of aquifer.

Future challenges and opportunities

- The rapid urban regeneration and urban renaissance of Hull as a regional city and a provider of housing, jobs, public services and amenities will increase pressure on land, but also provide opportunities for incorporating green infrastructure.
- Economic development and diversification in the Humber Estuary sub area will be a key driver for growth, with new growth exploiting multimodal transport links, ports and urban centres. Hull and the ports on both the south and north banks are important as key economic links for trade with Europe and as a ‘Global Gateway’.
- There is likely to be an increased need for infrastructure in relation to policies to optimize the use of ports and waterways, such as improving road and rail networks. In addition to the legal requirements to find compensation sites for any loss of biodiversity, the more strategic planned
approach to accommodating further industrial expansion on the south bank may open up opportunities for enhancing biodiversity.

- There is an increasing need for renewable energy with potential combined heat and power plants, on-shore turbines, construction facilities for off-shore turbines, and trials for tidal power. Grid connections for large off-shore windfarms may affect the area around Killingholme and east of Hull.

- The coastal landscapes are dynamic and constantly changing, with sand and gravel deposits from the Holderness coast feeding Spurn Point and the shores within the Humber estuary. These processes need to be monitored to ensure the peninsula remains as a naturally evolving geomorphological feature.

- Sea level rise and coastal squeeze are likely to continue, resulting not only in loss of inter-tidal habitats but also fresh water and wetland habitats, and brackish water. For example, Far Ings NNR and similar habitats are likely to become inter-tidal within the next 50 years. A strategic approach is underway and will identify and implement locations for managed realignment to provide compensatory habitat for intertidal losses. Managed realignment sites will also be needed to compensate for the loss of designated intertidal habitats resulting from development, as at Chowder Ness, Welwick and Paul Holme Strays. Future developments on the south bank may require agricultural land on the north bank to be converted to intertidal habitats.

- Other habitats such as floodplain grazing marsh, reedbeds, brackish and freshwater habitats may also be affected by coastal squeeze, and opportunities will need to be sought to replace these.

Supporting document 3: Analysis supporting Statements of Environmental Opportunity

The following analysis shows the projected impact of Statements of Environmental Opportunity on ecosystem service provision:

<table>
<thead>
<tr>
<th>Statements of Environmental Opportunity</th>
<th>Ecosystem Service</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEO 1</strong>: Protect and enhance the dynamic and inspiring estuarine and coastal landscape with its interrelated habitats of sand dunes, saltmarsh, reed beds, saline lagoons and mudflats, extending the internationally important habitats and the wildlife dependent upon them, while addressing coastal squeeze, climate change and dynamic coastal processes.</td>
<td></td>
</tr>
</tbody>
</table>
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 | ![Arrows indicating impact levels](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

<table>
<thead>
<tr>
<th>Landscape attribute</th>
<th>Justification for selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expansive, open, low-lying estuarine landscape, with wide expanses of open water,</td>
<td>- Long and expansive views possible through absence of tree cover as well as the wide expanses of open water and sea.</td>
</tr>
<tr>
<td>big skies and long views punctuated by views of major industrial installations,</td>
<td>- The magnificent Humber Bridge, widely visible up and down the estuary, as are iconic structures such as Hull's tidal surge barrier, ‘The Deep’ on the water’s edge at Hull, and the lighthouses and control tower on Spurn Point.</td>
</tr>
<tr>
<td>prominent structures, and busy shipping route along the estuary.</td>
<td></td>
</tr>
<tr>
<td>Coastal and inter-tidal habitats, which include sand dunes, salt marsh, reedbeds,</td>
<td>- The estuary is designated SSSI, and is a Ramsar site; it is also a designated Special Protection Area (SPA) for the many overwintering and breeding birds that are supported, including golden plover, bar-tailed godwit, avocet, marsh and harriers.</td>
</tr>
<tr>
<td>mudflats, sandy shores, supporting rich wildlife and revealing the dynamic</td>
<td>- The estuary is also a designated Special Area of Conservation (SAC) for its dynamic and changing system of accreting and eroding intertidal and sub-tidal mudflats, saltmarshes, reedbeds, fixed and mobile dunes and dune grassland, as well as supporting populations of grey seals and lampreys.</td>
</tr>
<tr>
<td>geomorphology of the estuary.</td>
<td>- Spurn Point, a peninsula subject to the processes of erosion and accretion, and Far Ings are National Nature Reserves.</td>
</tr>
<tr>
<td>Sense of remoteness along the estuary, in particular on Spurn Point.</td>
<td>- New wildlife habitats are being created as a result of compensation sites or managed realignment of the estuary, for instance as at Alkborough Flats.</td>
</tr>
<tr>
<td></td>
<td>- Spurn Point is a designated Heritage Coast.</td>
</tr>
<tr>
<td></td>
<td>- High levels of tranquillity on the Spurn peninsula and in rural areas on the north side and along the upper reaches of the estuary.</td>
</tr>
</tbody>
</table>
## Landscape attribute

**Strong agricultural character to rural areas, with productive land under arable crops, in a large scale landscape of large fields, ditches, particularly distinctive on the north side; generally few trees.**

- 37% of the land is Grade 1 and 2, and is therefore under productive cultivation, while another 30% is Grade 3.
- Settlements in the rural areas are small and scattered.
- The relatively recent reclamation of much of the land means that there are few long established landscape features such as woodlands.

**Contrasts between quiet rural areas with small scattered settlements and busy urban areas and industrial complexes.**

- Proximity of deep water has enabled the development of ports to facilitate the import and export of a wide range of goods and materials, and has given rise to oil refineries and chemical works.
- Few settlements outside main urban areas.

**Connections with history through evident lighthouses and defence structures, Hull as an important trading centre and more recently the Humber Bridge connecting opposite sides of the estuary**

- Early archaeological evidence reveals importance of estuary for trade and communications between the North Sea and inland from the start of historic time.
- Very fine municipal architecture dating from 19th century in the centre of Hull, reflecting its prosperity at that time.
- Prominent 19th century lighthouses on Spurn Point, plus a vessel traffic services tower and coastal defences.
- 19th century artillery battery and minefield control centre at Paull Point, World War I forts and an acoustic mirror at Kilnsea, and World War II anti-aircraft batteries and bomb decoys.
Landscape opportunities

- Protect the open and expansive character of the landscape, with its big skies and long views, and the strong contrasts between remote, rural areas and busy urban and industrial areas.

- Allow for the continuing dynamic coastal processes, and protect the range of estuarine, coastal and wetland habitats that contribute to landscape character and support the wide range of wildlife.

- Protect and manage the historic features that reveal the links with the changing use of the area over time for communications and defence, and record any historic features that may be lost through rising sea levels.

- Manage the network of drains and ditches so that they form more effective features within the landscape, provide good quality habitat and form links between wetlands and other semi-natural habitats.

- Maintain the agricultural landscape, taking opportunities where possible to improve its contribution to the landscape and biodiversity contained within it.

- Plan for rising sea levels through finding opportunities to pull back flood banks or construct soft defences, enabling inter-tidal habitats to develop and ensuring that they are established so that they enhance biodiversity and strengthen landscape character.

- Create habitats and landscape features such as wet grassland and reedbeds within both new and existing industrial developments and urban areas.

- Seek opportunities to improve access so that more people can enjoy the estuary with its big skies, long views, historic features and abundant wildlife.
## 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 analysis and opportunities may change upon publication of further evidence and better understanding of the inter-relationship between services at a local level.

<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
<th>Main beneficiary</th>
<th>State</th>
<th>Analysis</th>
<th>Opportunities</th>
<th>Principle services offered by opportunity</th>
</tr>
</thead>
</table>
| Food provision     | High quality agricultural land Estuary waters | Regional         | This is productive agricultural land, with 1% Grade 1, 36% Grade 2 and 30% Grade 3. Commercial fishing and small scale wildfowling and angling. | Agriculture is mainly based around large farms producing cereals, oilseeds and other arable crops, (over 77% of the farmed area), with just 16% put down to grass or uncropped. Livestock rearing is focussed on pigs.  
Expansion of food production could put further pressure on limited water availability, as well as on soil quality, with the risk of increasing the possibility of saline intrusion into groundwater.  
Introduction of crops such as maize could impact on the use of land by estuary birds for roosting, feeding and loafing.  
The estuary supports significant commercial fisheries. | Ensure that soils are managed to enable continued agricultural production.  
Select crops that have reduced requirement for irrigation.  
Address demand for water through providing more on-farm water storage.  
Address water quality and protection of estuarine habitats and processes to ensure continued populations of fish. | Food provision Water availability Regulating water quality Regulating soil quality |
<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
<th>Main beneficiary</th>
<th>State</th>
<th>Analysis</th>
<th>Opportunities</th>
<th>Principle services offered by opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber provision</td>
<td>Woodland cover</td>
<td>Local</td>
<td>Insignificant existing woodland (0.6% of area)</td>
<td>Woodland cover is sparse and confined to small woodlands and plantations</td>
<td>Opportunity to manage the many under managed broadleaved woodlands in this NCA to provide timber and to encourage new woodlands in appropriate areas to provide biodiversity connectivity and increase recreation provision.</td>
<td>Timber provision</td>
</tr>
<tr>
<td>Water availability</td>
<td>Chalk aquifer, Groundwater Rivers</td>
<td>Regional</td>
<td>The NCA overlays a major chalk aquifer, which is important for an extensive area beyond the NCA as it supplies a large proportion of water for public supply and farming needs. On the north of the Humber, groundwater sources have 'no water available' (around Hull) or are 'over licensed' (around Brough).</td>
<td>Water from the River Hull is generally not useable for licensed purposes due to saline intrusion. Abstraction licenses on the north side are restricted to ensure that groundwater flow into the Humber is maintained for as long as possible to reduce saline intrusion when groundwater levels are low. On the south shore of the Humber, groundwater sources are mostly 'over licensed', with a marginally improved status of 'no water available' around Whitton. Overall, it is judged that there is 'no risk' to surface water from abstraction or flow pressure, and 'moderate' risk to groundwater from abstraction in this NCA.</td>
<td>Adopt land management practices that improve soil infiltration, in particular permanent grassland. Increase the extent of semi-natural habitats. Adopt cultivation practices that reduce demand for water for irrigation of crops.</td>
<td>Water availability, Regulating soil erosion, Regulating soil quality, Biodiversity</td>
</tr>
</tbody>
</table>

### 41. Humber Estuary

<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
<th>Main beneficiary</th>
<th>State</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass provision</td>
<td>Existing woodland</td>
<td>Local</td>
<td>Insignificant woodland cover (0.6%).</td>
<td>The limited woodland cover offers very little potential for providing wood fuel. There is a low potential yield for Short Rotation Coppice, with some areas of medium potential on the south shore of the Humber. There is a high potential yield for miscanthus throughout the NCA. There are potential landscape impacts from biomass plantings within the NCA, which are considered in the tables on the Natural England website, and also potential impacts on estuarine bird populations. There may be scope for increasing the area of biomass in relation to new developments, but the crops need to be located to avoid impacting on feeding or breeding areas for waders, or blocking key views or reducing the expansive character of the landscape. Extensive biomass crops are unlikely as much of the land is used for productive arable cropping.</td>
</tr>
<tr>
<td></td>
<td>Biomass crops</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### National Character Area profile:

#### Summary

**41. Humber Estuary**

<table>
<thead>
<tr>
<th>Service</th>
<th>Assets/attributes: main contributors to service</th>
<th>Main beneficiary</th>
<th>State</th>
<th>Analysis</th>
<th>Opportunities</th>
<th>Principle services offered by opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate regulation</td>
<td>Grazing marsh, Reedbeds, Mudflats</td>
<td>National</td>
<td>Extensive areas of grazing marsh close to the estuary (3% of the area); also reedbeds (2%) and mudflats (1%).</td>
<td>The soils in this NCA generally have a low carbon content of 0 to 5% reflecting the dominance of mineral soils. Some of the soils of the coastal flats may have more organic-rich topsoils that will be important to conserve. In addition, significant carbon storage will be provided by the more than 2,000 ha of grazing marsh, reedbeds, and the mud flats and marine sediments, all of which store high levels of organic matter. Some of these may be lost through sea level rise. Climate change may cause sea level rises and changes in habitats, so species will need habitat corridors and stepping stones to be able to move in response to those changes. In order to keep pace with the predicted rates of sea level rise, a large amount of extra sediment is likely to be required in the future to maintain important natural features and habitats.</td>
<td>Adopt cultivation practices that retain and increase the organic content of soils, such as over-wintering stubble and including fallow in rotations, and where possible increase the area of permanent grassland. Adopt cultivation practices that reduce reliance on high levels of fertiliser application. Seek opportunities to protect and expand areas of grazing marsh, reedbeds, saltmarsh and mudflats. Seek opportunities to move flood defences back to provide space for the development of new intertidal habitats. Ensure that realignment sites are managed to develop their full potential to support and enhance the biodiversity interest and characteristic landscape of the estuary.</td>
<td>Climate Regulation, Water quality, Regulating soil erosion, Regulating soil quality, Biodiversity, Sense of place/inspiration, Geodiversity</td>
</tr>
</tbody>
</table>

**Continued on next page...**
<table>
<thead>
<tr>
<th>Service</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Climate regulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>... continued from previous page. Seek opportunities to link fragmented habitats with other semi-natural habitats such as well managed ditches and grasslands, to enable species to move in response to changing sea levels and habitats. Ensure that natural processes of sediment accretion and erosion are able to continue.</td>
<td></td>
</tr>
</tbody>
</table>
## National Character Area profile:

### 41. Humber Estuary

<table>
<thead>
<tr>
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<th>Opportunities</th>
<th>Principle services offered by opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulating water quality</td>
<td>The estuary Chalk aquifer</td>
<td>Regional</td>
<td></td>
<td>The ecological status of surface water bodies and the ecological potential of heavily modified water bodies such as canals and drains on the north shore of the Humber is generally 'moderate', and on the south shore is generally 'poor'. The chemical status of groundwater in this NCA is 'poor' and in a small part of the East Yorkshire Chalk around Hull is at risk from saline intrusion. The ecological potential of the estuarine waters of the Humber, considered a 'heavily modified' water body, is 'moderate', while the chemical status of the Humber estuarine waters is 'failing to achieve good' status. Current WFD assessments of the chemical quality of the water in the estuary indicate that parts of the estuary fail.</td>
<td>Establish buffers of permanent grassland along watercourses Reduce nutrient run-off by balancing fertiliser inputs with needs Reduce demand for water for irrigation, by selecting more drought resistant crops and / or increasing water storage capacity on farms Manage pumped drainage of the area in such a way as to ensure that saline waters are not drawn in</td>
<td>Regulating water quality Regulating soil erosion Biodiversity Water availability</td>
</tr>
</tbody>
</table>

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### 41. Humber Estuary

<table>
<thead>
<tr>
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<th>State</th>
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<th>Opportunities</th>
<th>Principle services offered by opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulating water flow</td>
<td>Estuary Inflowing rivers</td>
<td>Local</td>
<td>Increased storm frequency is leading to higher flood flows coming downstream into the estuary.</td>
<td>Most measures to address river flood issues for example encouraging extension of flood storage areas, slowing the flow of watercourses through restoring natural routes, flooding of ings, planting, etc would be more effective when applied to rivers and streams upstream, especially upstream of Hull in NCA 40 Holderness.</td>
<td>Manage the network of ditches and drains to ensure that whilst operating effectively to drain the land, they also make a positive contribution to the landscape and to biodiversity, and act as links between other semi-natural habitats.</td>
<td>Regulating water flow Sense of place/inspiration Biodiversity Geodiversity</td>
</tr>
</tbody>
</table>
### National Character

#### Area profile:

<table>
<thead>
<tr>
<th>Service</th>
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<th>Principle services offered by opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulating soil quality</td>
<td>Fertile soils</td>
<td>Regional</td>
<td>Loamy and clayey soils of coastal flats with naturally high groundwater, cover 79% of the NCA. Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (8%). Slightly acid loamy and clayey soils with impeded drainage (5%). Saltmarsh soils (2%). Freely draining lime-rich loamy soils (1%).</td>
<td>The loamy and clayey soils of coastal flats with naturally high groundwater have high agricultural potential but this is dependent on the continued ability to pump drain and protect the soils from sea flooding / saline intrusion (also locally some soils are saline and at risk of structural damage where drained). Where there is a high silt / fine sand content and / or drainage is poor, capping may occur, which can be reduced by increasing the soil organic matter content, while compaction may occur if heavy machinery is used.</td>
<td>In those areas with high groundwater, seek cultivation practices / crops that can cope with the conditions. Seek ways of reducing demand for water by selecting of crops and / or increasing storage of water on farms, to prevent any saline intrusion from damaging soils. Adopt cultivation practices that increase organic content of soils, such as introducing fallow into rotations, over-winter stubbles, direct drill and grass leys. Avoid overstocking or using machinery where it would lead to the compaction of vulnerable soils.</td>
<td>Regulating soil quality Regulating soil erosion Biodiversity</td>
</tr>
<tr>
<td>Service</td>
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<td>State</td>
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<td>Opportunities</td>
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<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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</tbody>
</table>
| Regulating soil erosion     | Fertile soils                                   | Regional         | Loamy and clayey soils and slowly permeable seasonally wet slightly acid but base rich loamy and clayey soils; 87% of area.  
Slightly acid loamy and clayey soils with impeded drainage; 5% of area.  
Free draining lime rich loamy soils  
The entire NCA, with the exception of a small area in the south east at Grimsby, is part of a Defra Priority Catchment (the East Riding of Yorkshire and North Lincolnshire catchment). | While the majority of the area is not significantly prone to soil erosion, there are places where sediment run-off and compaction are to be avoided.  
The saltmarsh and mudflats play an important role in protecting inland soils from loss through coastal erosion and thus need to be protected.  
The loamy and clayey soils of coastal flats with naturally high groundwater and the slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils have a low risk of soil erosion.  
However, the slightly acid loamy and clayey soils with impeded drainage are prone to capping/slaking, and are easily compacted by machinery or livestock if accessed when wet, increasing the risks of soil erosion by surface water run-off.  
The freely draining lime-rich loamy soils are also potentially at risk of erosion where cultivated or bare soil is exposed.  
Priorities in this catchment include measures to reduce sedimentation in watercourses and to reduce soil damage by livestock and vehicles.  
Inter-tidal habitats such as mudflats and saltmarsh effectively absorb the energy of waves, and thus provide a defence against erosion of soils. | Create grass buffers along ditches and watercourses to capture sediment run-off  
Protect saltmarsh and other inter-tidal habitats to create a buffer between the sea and agricultural land.  
Manage abstraction of groundwater to prevent saline intrusion.  
Ensure the retention of mudflats and saltmarshes, to provide a cost effective defence against soil erosion. | Regulating soil erosion  
Regulating soil quality  
Regulating water quality  
Biodiversity |

* Natural England, Capital Grant Scheme  
- Funding Priority Statement 2010/11, Catchment 6: East Riding of Yorkshire and North Lincolnshire, date unknown.
### 41. Humber Estuary

#### Summary

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<th>Opportunities</th>
<th>Principle services offered by opportunity</th>
</tr>
</thead>
</table>
| Pollination | Semi-natural habitats, including saltmarsh         | Local            | 3% of the area is floodplain grazing marsh, with 2% reedbeds, 1% lowland meadows and 1% fens. | Pollinating insects are generally supported by a range of semi-natural habitats, in particular species rich grasslands. There are limited areas of semi-natural habitats especially within the inland agricultural areas. | Seek opportunities to introduce flower rich grasslands within arable areas, creating connecting links with other semi-natural habitats where possible. Protect areas of saltmarsh and other semi-natural habitats, and extend where possible | Pollination  
Biodiversity  
Sense of place/inspiration |
### 41. Humber Estuary

#### National Character Area profile:

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<tbody>
<tr>
<td>Regulating coastal erosion</td>
<td>Sea and estuary Spurn Head peninsula</td>
<td>National</td>
<td>The Estuary is experiencing rising sea levels, which when combined with high river flows and low atmospheric pressure can result in significant flooding. The whole NCA falls within a flood risk area, and reflecting this risk, essentially the entire estuarine shore is protected by flood defences.</td>
<td>Settlements at risk of coastal flooding include Barton upon Humber, Easington and Kilnsea. The approach to the management of these coastal defences on the north shore of the Humber is generally to 'hold the line', with realignment of the defences at Kilnsea. The approach at Easington is to ensure continued protection of the gas terminal from coastal erosion. No active intervention will occur in areas where the maintenance of defences will become uneconomic, whilst in some areas flood defences will be moved through managed realignment to create new intertidal habitat and also provide flood storage to help manage water levels. On the south shore of the Humber, from Immingham to Grimsby, the approach is to hold the line of existing coastal defences throughout the long term (to 2105), protecting the significant industry, port and residential areas here.</td>
<td>Seek opportunities to move flood defences inland, thus ensuring that intertidal habitats can expand and respond to rising sea levels. Ensure that realignments are managed so that inter-tidal habitats can develop and expand effectively. Monitor processes affecting Spurn peninsula, and work with partners to find solutions that enable dynamic coastal processes to continue, but taking into account the need to protect access to key facilities on the peninsula. Seek opportunities to create fresh water habitats, wetland habitats, brackish water bodies to compensate for those lost through rising sea levels.</td>
<td></td>
</tr>
</tbody>
</table>

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11 Humber Estuary Coastal Authorities Group, Flamborough Head to Gibraltar Point Shoreline Management Plan Non-Technical Summary, Consultation Draft, 2009
### 41. Humber Estuary

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<tr>
<td>Regulating coastal erosion continued</td>
<td></td>
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<td>However there is uncertainty about the impact of coastal processes on the future of Spurn Head. One theory is that the barrier will retreat westward, ‘rolling over’ toward the estuary as the coastal side erodes, and that any breaches would be self-repaired by sediment deposition. Another theory is that a breach would not be repaired, and the Humber would use a new breach channel to drain into the North Sea, causing rapid erosion and possible loss of the entire peninsula, leaving Spurn Head as an island. Current data suggests that such a breach may occur within five to ten years time (2012-2022). Tidal flooding, exacerbated by rising sea levels, and combined with high river flows and rainfall, represents a high risk, especially to Hull, as almost the whole of the city is below highest tide levels and its drainage infrastructure struggles to cope with extreme events. Due to the low levels, the city’s drainage system is reliant on pumps, and if these fail or their capacity is reached, then widespread flooding can occur. At the mouth of the River Hull, the Hull Tidal Surge Barrier has been built to prevent floodwater from the Humber overtopping defences along the River Hull.</td>
<td>Where existing flood defences are reinforced, work with partners to ensure that there are no adverse impacts on features of biodiversity and historic interest, and that the open character of the area, the long views and access to the shores of the estuary are maintained.</td>
<td></td>
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</tbody>
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12 Environment Agency, Hull and Coastal Streams Catchment Flood Management Plan, draft main stage summary document, June 2008

**Continued overleaf...**
### 41. Humber Estuary

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<tr>
<td>Regulating coastal erosion continued</td>
<td></td>
<td></td>
<td></td>
<td>Along the south shore of the Humber, there are few settlements at risk from fluvial flooding. Barton-upon-Humber is at risk from a combination of localised surface water and groundwater as well as flooding from rivers and drains, and in addition to embankments, is also protected by a pumping station. Spurn Head peninsula is key to the protection of the estuary, creating sheltered waters where mudflats can build up. It also provides protection against waves to areas such as Cleethorpes and Grimsby to the south of this NCA. The roll-over or breach of Spurn Head would result in significant changes in patterns of erosion and accretion within the estuary, and would expose more of the shoreline to the energy of the waves. It also has the potential for adverse impacts on the internationally designated sites in the Humber Estuary. The coastal policy approach at Spurn Head peninsula recognises that the continued repair of breaches is unsustainable in technical, economic and environmental terms. The aim is therefore to allow the peninsula to evolve naturally with as little intervention as possible, whilst maintaining access to the key facilities at Spurn Head.</td>
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<tbody>
<tr>
<td>Regulating coastal erosion continued</td>
<td></td>
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<td></td>
<td>It is possible that with the predicted rise of sea levels a large amount of extra sediment is likely to be required in the future to maintain the important natural processes and the habitats created. With rising sea levels, there will be continuing coastal squeeze, which will require the managed realignment of flood defences to enable intertidal habitats to shift and expand. Saltmarshes and mudflats very effectively dissipate the energy of waves, and thus their retention and expansion represents a cost effective flood defence strategy, as well as providing habitats. Managed realignment may also subsequently affect adjacent fresh and brackish water habitats, and these losses will need to be addressed.</td>
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</tr>
<tr>
<td>Sense of place/Inspiration</td>
<td>Expansive, flat, low-lying estuarine landscape with big open skies and lack of trees</td>
<td>Regional</td>
<td>The mix of coastal influences, busy shipping lanes, modern industrial complexes and agriculture give the area its particular character. Iconic features such as the Humber Bridge, the Deep, the lighthouse and control tower on Spurn Point all form distinctive focal points within the area. The mudflats support internationally important populations of breeding and wintering birds, often seen feeding and flying along the shoreline, while other notable estuarine features include saltmarsh, dunes and shingle structures, particularly the distinctive landform of Spurn Head. The reclaimed marshland itself is characterised by an open landscape of drainage channels and high flood banks, supporting large rectangular arable fields and limited scattered tree cover. Spurn Point is designated Heritage Coast for its outstanding landscape and recreational experience.</td>
<td>The tidal nature of the estuary along with the weather provides an ever changing scene, dominated by either water or extensive stretches of intertidal mudflats. Of particular note are the flocks of birds, and the opportunity for birdwatching along the Spurn peninsula, which is located on key migration routes. Some remote places such as Alkborough, Goxhill and Spurn Point, can also provide inspiring experiences because of their sense of remoteness and ‘wildness’.</td>
<td>Maintain expansive character of area, including long views and tranquil areas. Plan new developments so that long views are retained. Improve access to flood banks (where there is no adverse impact on biodiversity) so that more people can experience the distinctive estuarine landscape, with its internationally important populations of birds. Improve understanding of the many features and functions of the estuary, including its active geomorphological processes and wildlife value.</td>
<td>Sense of place/inspiration</td>
</tr>
</tbody>
</table>

National Character Area profile:
### 41. Humber Estuary

#### National Character

**Area profile:**

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<th>Key facts and data</th>
<th>Landscape change</th>
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<tr>
<td><strong>Sense of history</strong></td>
<td><strong>Assets/attributes: main contributors to service</strong></td>
<td><strong>Main beneficiary</strong></td>
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<td><strong>Analysis</strong></td>
<td><strong>Opportunities</strong></td>
<td><strong>Principle Services Offered by Opportunities</strong></td>
</tr>
<tr>
<td>Sense of history</td>
<td>Drainage history</td>
<td>Local</td>
<td>A sense of history is evident in the reclaimed marshland landscape, including occasional drainage dykes constructed in Roman and medieval periods, along with the extensive channels, ‘warping’ drains, flood protection berms and sophisticated sluice and pumping systems dating from the late 17th century. The wetlands preserve nationally important palaeo-environmental and archaeological evidence. Other historical features that are particularly evident are those relating to defence, such as the 19th century artillery battery at Paull Point and bombing decoys at Little Humber. Also clearly visible are the 19th century lighthouses on Spurn Head near to the 20th century shipping traffic control tower, and further inland the iconic Humber Bridge, built in 1981.</td>
<td>This landscape is of particular interest due to its relatively recent history of reclamation, with land protected from the sea by high flood banks. There are a number of iconic structures which form important focal points when travelling around the NCA. But there is also historic interest in villages, along with evidence of early industrial activities. Restoration of historic features should use local materials and respect local styles.</td>
<td>This landscape is of particular interest due to its relatively recent history of reclamation, with land protected from the sea by high flood banks. There are a number of iconic structures which form important focal points when travelling around the NCA. But there is also historic interest in villages, along with evidence of early industrial activities. Restoration of historic features should use local materials and respect local styles.</td>
<td>Sense of history</td>
</tr>
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### 41. Humber Estuary

**Service**

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<tbody>
<tr>
<td>Tranquility</td>
<td>Remote locations such as Alkborough, Goxhill, Blacktoft, Spurn Point</td>
<td>Regional</td>
<td>This NCA has very contrasting areas. Thus Hull and the industrialised areas and ports, are far from tranquil, with the constant movement of ships, in contrast to the quieter rural areas, and the open estuary itself. 45% of the area is still classified as ‘undisturbed’, a decline from 55% since the 1960s(^4). There are important localised areas of tranquillity associated with the mud flats and estuarine landscape to the east of the area at Sunk Island and west of Hull at the head of the estuary, as well as at Alkborough and Blacktoft. Spurn Point in particular retains ‘another world’ quality, all but cut off from the mainland, stretching out between the North Sea and the wide open waters of the estuary.</td>
<td>It is important to retain the contrasts between busy, active areas and more remote rural or ‘wild’ areas. This will require containment of development into busy areas, and control of intrusive elements such as lighting.</td>
<td>Ensure that new developments are contained within or adjacent to the existing industrial and urban areas, to retain the contrast between them and the remote rural areas. Ensure that light spill is kept to a minimum.</td>
</tr>
</tbody>
</table>

\(^4\) CPRE intrusion map, 2007
# 41. Humber Estuary

## Summary

**Service**: Assets/attributes: main contributors to service

- **Main beneficiary**
  - Regional

- **State**
  - 216 km of rights of way, at the relatively low density of 0.77 km per km²
  - 136 parks and open spaces within city of Hull
  - Spurn Point, designated Heritage Coast
  - Angling

## Description

**Biodiversity**

- Ramsar site 37,988 ha
- SPA 37,630 ha
- SAC 36,657 ha
- NNR 255 ha

The estuary comprises a dynamic and changing system of accreting and eroding intertidal and subtidal mudflats, sandflats and other estuarine features, and is a designated Ramsar site, Special Area of Conservation and SSSI. It is internationally important for river and sea lamprey, and for its colonies of grey seals.

The coastal squeeze that affects the inter-tidal habitats is clearly a priority, to ensure that they retain their functions including supporting a wide range of wildlife, in the face of rising sea levels and increase in storm events. Also there is a need to create new fresh and brackish water habitats to replace those lost through realignments in response to rising sea levels.

Seek opportunities to move flood defences inland to provide more space for inter-tidal habitats to develop and move in response to sea level rises. Seek opportunities to create fresh and brackish water habitats to replace any lost through rising sea levels, and ensure that they provide connecting links between the estuary and inland areas.

## Opportunities

**Recreation**

- Ensure that green spaces are incorporated into new developments in and around existing urban areas.
- Seek ways of linking urban green spaces with rights of way and creating circular routes, thus improving access out from urban areas, especially Hull, into the countryside.
- Provide access to the flood banks along the estuary, where this will not disturb key bird populations, so that people can benefit from long views out over the water.
- Maintain fishing stock by protecting estuarine habitats, and maintaining access to coast and estuary for angling.

## Supporting documents

- Key facts and data
- Landscape change
- Analysis
## 41. Humber Estuary

### Summary

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<tr>
<td><strong>Biodiversity continued</strong></td>
<td></td>
<td>The estuary is also a designated Special Protection Area for the range of over-wintering and breeding birds that it attracts, including large numbers of golden plover, bar-tailed godwit, ruff, avocet, bittern, little tern, marsh and hen harriers. It also attracts a large number and variety of non-breeding water birds. Spurn Point and Far Ings, a complex of open water and reedbeds on the south side of the estuary, are both National Nature Reserves. Drainage ditches, especially along the south side of the estuary, are particularly important for the populations of water voles that they support.</td>
<td>There is a legal requirement to find adequate compensation and mitigation sites as a response to any new development on the estuary that may impact on the biodiversity interest. In addition to the estuarine habitats, areas of land landward of the flood defences also play a vital role in providing feeding and shelter for the important populations of birds.</td>
<td>Ensure that land used by bird populations for foraging and roosting, outside the designated areas, are adequately protected and managed. Ensure that the estuarine habitats are protected and supported by corridors and stepping stones in surrounding land. Ensure that the network of ditches is well managed so that they provide suitable habitats for water voles, otters and other wildlife. Seek opportunities to buffer and expand existing semi-natural habitats, to link them with grassland strips and create connecting networks to enable species movements. Ensure that new developments adequately incorporate features to make a positive contribution to biodiversity, creating a ‘permeable’ landscape where possible, allowing for species movement. Support the strategic approach to assimilating new industrial development, in particular on the south bank, to ensure co-ordination of changes so that the internationally significant biodiversity is protected and enhanced.</td>
</tr>
</tbody>
</table>
### Geodiversity

#### Assets/attributes: main contributors to service
- Geomorphological processes
- Geological exposures
- Spurn peninsula

#### Main beneficiary
- International

#### State
- There is a constantly changing and dynamic system of accretion and erosion along the coastline, creating intertidal and subtidal mudflats, sandflats, saltmarsh, reedbeds within the estuary, and changing deposits and erosion of sand and sand dunes along the North Sea coast.

- Spurn is an outstanding example of a dynamic spit system, very unusual, if not unique in Europe, in that the massive supply of sediment from the North Sea and from erosion of the Holderness coast to the north has enabled it to extend across the mouth of a macro-tidal estuary. There exists an exceptionally long historical map record and written accounts extending back to the 7th Century AD.

- A short stretch of cliff and foreshore at South Ferriby reveals exposures of Pleistocene glacial and post-glacial sediments – a complex mix of till (boulder clays) interbedded with silts and gravels. Resting on these are sandy chalk gravels of probable fluvo-glacial origin.

#### Analysis
- The interest of this area relates to its very active geomorphological processes. The historic records for Spurn Peninsula indicate that the spit continuously shifts its location in response to dynamic coastal processes, especially the ongoing erosion of the Holderness coast.

- The succession of sediments exposed at the cliffs is central to understanding the glacial and post glacial history of the area, including the development of Lake Humber and the effects of peri-glacial environments.

#### Opportunities
- Continue to research, monitor and record geomorphological processes, to improve our understanding of them and to inform management decisions.

- Protect the natural dynamic processes that affect both the estuary and coastline.

- Provide access to sites of geological interest, in particular to the cliffs, where appropriate, and interpret the geological features, to improve understanding and enjoyment.

- Provide interpretation of the dynamic processes underway in the estuary and along the coast, to improve understanding and enjoyment.

#### Principle Services Offered by Opportunities
- Geodiversity
  - Sense of place/inspiration
41. Humber Estuary

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Catalogue Code: NE344

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