



Introduction

As part of Natural England's responsibilities as set out in the Natural Environment White Paper,¹ Biodiversity 2020² and the European Landscape Convention,³ we are revising profiles for England's 159 National Character Areas (NCAs). These are areas that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries, making them a good decision-making framework for the natural environment.

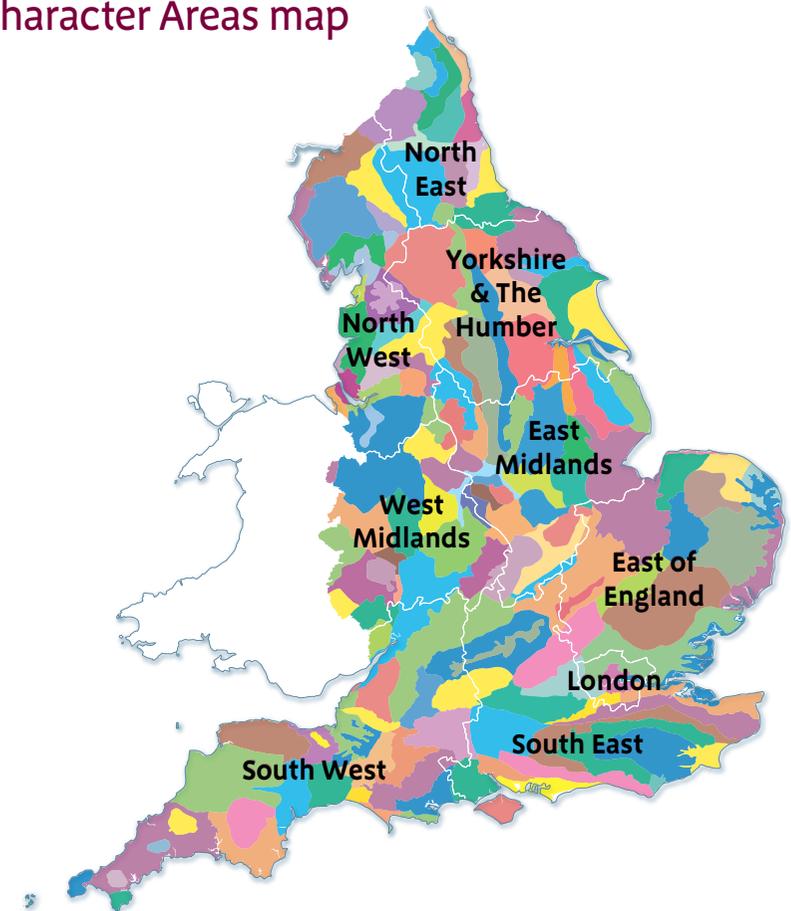
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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

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

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

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

National Character Areas map



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

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

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

Summary

This area is characterised by a wide coastal plain which extends from Barton-upon-Humber in the north, across to Grimsby at the mouth of the Humber and south to Skegness. The area is bounded by the North Sea along its eastern edge and by the Lincolnshire Wolds to the west. The wide coastal plain incorporates three distinctively different but closely interconnected areas which run broadly parallel with the edge of the Wolds. To the west is the Middle Marsh which comprises a softly undulating arable landscape with a greater number of woodlands and hedgerows than other areas. To the east lies the Outmarsh, an open landscape of arable land, mixed with rich pasture divided by narrow dykes. The Outmarsh has changed in character – and was once as grassy as Romney Marsh or the Somerset Levels. It has gradually turned into an area which is predominately arable, particularly since effective pump drainage was introduced in the 2nd half of the 20th century, following the 1953 floods.

Finally, there is the open, wild and ever-changing landscape of the coast itself, which is subject to continuous erosion and accretion. It has extensive stretches of intertidal habitats including salt marsh, coastal dunes and wetlands. To the north, the offshore gradient is so slight that at low tide extensive sand flats and mudflats are exposed. Half of the coast is internationally recognised for its biodiversity and in particular the bird species that it supports. There are adjacent estuaries; to the north the Humber Estuary and to the south, the Wash and the area is of international significance as a Ramsar site, with half of the NCA coast designated as a Special Protection Area for the large flocks of overwintering migratory and breeding birds. Several National Nature Reserves follow this part of the Lincolnshire and some key species exist, including an important breeding

colony of grey seals. In the south, Gibraltar Point, at the entrance to the Wash, is internationally designated for its area of dunes, salt marsh and shingle.

Most settlement is concentrated on the coast, around Grimsby and the resorts of Skegness, Mablethorpe and Cleethorpes, whose fine sandy beaches and low rainfall have attracted holiday-makers for generations. The extensive caravan parks, particularly around Skegness, are very distinct from the rest of the area. There are no cities within the NCA; however, the settlement pattern is very built up around Grimsby which is an important trading route at the mouth of the Humber and was once the largest fishing port in the country. Southwards from Grimsby the settlement pattern is

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



Coastal processes in the intertidal areas ensure that the landscape is continually changing.

dispersed while inland there are nucleated settlement patterns, with many smaller villages and the historic market towns of Louth and Alford.

Much of the agricultural land of the Outmarsh has been reclaimed from the sea over many centuries. Food production is important within the National Character Area (NCA) with cereals, root crops, oilseed and very small amount of vegetables grown. There is also mixed farming and pastoral land grazed by cattle and sheep with areas of grazing marsh.

A complex series of rivers flow slowly east across the plain to the sea, some natural, some manmade, such as the many drains and ditches which combine to form important networks linking with other semi-natural habitats. Several rivers, such as the Great Eau, terminate as raised embanked water carriers. The chalk streams which occur are important for their unique biodiversity. The underlying chalk bedrock acts as a major aquifer, supplying water to homes and industry in the wider region.

The investment in coastal protection has been significant on this part of the east coast and includes hard defences, the Lincshore scheme introduced in 1994 and the maintenance of dunes.

The rising sea levels, when combined with river flooding, can potentially cause major flood events in the low-lying areas and there is a need for combined action in coastal areas to address flood risk. Major flooding has occurred in the area and fluvial flooding is managed by a network of over 30 pumping stations across the NCA. Addressing and understanding the natural coastal processes is a real challenge, particularly where coastal development exists.

Statements of Environmental Opportunities:

- **SEO 1:** Safeguard, manage and enhance the dynamic coastal landscape producing net gains in extent and quality of internationally and nationally important habitats including sand dunes, salt marsh, mudflats, saline lagoons, reedbeds and grazing marsh for the wildlife they support, to increase ecological resilience and to increase the landscape's ability to mitigate flood risk and climate change.
- **SEO 2:** Conserve and enhance the historic features and settlement character of the dispersed rural villages and market towns of the Middle Marsh and Outmarsh and the fishing heritage of the port of Grimsby. Encourage a strategic approach to land use planning to conserve and enhance the historic landscape and heritage features, encouraging initiatives which contribute towards green tourism, enhance green infrastructure links, manage the pressures of flood risk and climate change, and ensure that infrastructure developments, such as offshore wind turbines do not contribute negatively to the character of the area.
- **SEO 3:** Ensure sustainable food production while enhancing and strengthening the network of farmland features; manage, expand, create and link habitats within the Outmarsh and Middle Marsh to benefit biodiversity, soil and water quality by promoting farming and forestry practices that are able to adapt to climate change. Manage the rivers, water levels and the provision and quality of water in the whole catchment for human and ecological benefit.
- **SEO 4:** Conserve and enhance the character of the traditional seaside resorts and the long sandy beaches which help to make the area an important tourist destination; improve opportunities to enhance people's enjoyment of the undeveloped areas along the wild coast with its expansive coast and marsh landscape and its coastal features and wildlife, while protecting high levels of tranquillity and the extensive, open views both inland to the Wolds and also out to sea.



Water vole - a protected species found in the important wetland habitats of the Lincolnshire Coast and Marshes.

Description

Physical and functional links to other National Character Areas

The Lincolnshire Coast and Marshes National Character Area (NCA) is a low-lying, broad plain which forms the most easterly NCA in Lincolnshire. Its long eastern coastline is bounded largely by the North Sea with the northerly extent of the coastline joining the large expanse of the Humber Estuary while to the south lies the entrance to The Wash. The area therefore has strong coastal links with the adjoining The Fens and Humber Estuary NCAs. Marine processes strongly influence the physical and biological character of the NCA through sediment transfer. This NCA is within the same sediment cell as the Holderness and Humber Estuary NCAs. Marine sediments are transferred south, originating from the northerly coastlines, especially the Holderness coast, and, through accretion help intertidal habitats to adjust to rising sea levels.

There are long, wide coastal views across this NCA, and also out to adjoining areas. For example, the North Norfolk coast can be seen from the south of the NCA, and in the north there are views across the Humber Estuary to Spurn Head. Inland, the NCA rises to the dip slope of the Lincolnshire Wolds, from where there are long, open views over the coastal plain and marshes. Windfarms on- and off- shore can be found and looking inland, the rising land of the Wolds forms the backdrop to views.

The Lincolnshire Wolds Area of Outstanding Natural Beauty covers 3 per cent of the Lincolnshire Coast and Marshes NCA and, while most of this designated landscape falls within the adjacent Lincolnshire Wolds NCA, there are very

strong visual, recreational and access links with the coast and marshes.

Cretaceous Chalk underlies the area and extends into the adjacent NCAs. The Lincolnshire Coast and Marshes, Lincolnshire Wolds and Holderness NCAs share a major chalk aquifer which is used extensively for the supply of water in the region. Covenham Reservoir supplies water locally and a new pipeline has been constructed to provide drinking water to Boston in The Fens NCA.

A number of rivers including the Great Eau and River Freshney rise in the chalk streams in the Lincolnshire Wolds. They then slowly into the North Sea, flowing through the coastal plain via catch water drains and dykes, with the Eau becoming a raised embanked watercourse across the east of the NCA. To the south, the Steeping River drains to the adjoining The Fens NCA and on to the North Sea. A series of catch water drains and dykes are pumped into the Steeping which follows a canalised channel before discharging into the large Wash Estuary, thus providing an important fluvial and ecological link to The Wash.

The Port of Grimsby and Immingham provides an important national and international shipping link to Europe. There are east-west rail passenger and freight lines running through the area, connecting freight with the docks, and bringing in tourists to the holiday resorts. There are several major A roads connecting to the Humber Bridge and out to the M180 which form further transport corridors in the landscape. Offshore wind energy schemes connect to the grid through this NCA and the Theddlethorpe Gas Terminal on the coast is an important infrastructure link with the wider network.

The NCA is an important focus for tourism in the region and attracts people – particularly from Yorkshire and the East Midlands – who travel by rail and road to reach the tranquil environments and the coast's popular sandy beaches.

Key characteristics

- Flat coastal plain to the east, with dramatic skylines across great distances, rising gradually in the west to more undulating land at the foot of the adjacent Lincolnshire Wolds.
- Cretaceous Chalk underlies most of the area with later Quaternary sand, gravel and clay deposits laid down following glacial activity. Slowly permeable, seasonally waterlogged fine and fertile loamy soils.
- Strong marine influences of accretion and erosion shape the coastline with extensive wide, shallow beaches, vast areas of mudflats, major dune systems, continuous lengths of artificial sea defences, and numerous sandy beaches and nature reserves.
- Important coastal habitats are managed for nature conservation. There are coastal mudflats and a dune complex in Cleethorpes. Extensive dune systems and salt marshes support a wide range of overwintering and migratory seabirds. At Gibraltar Point an ancient calcareous dune system exists and coastal saline lagoons, reedbeds and mudflats are important for their biodiversity.
- Land management has had a fundamental impact on the character of this area, with a clear distinction between the higher ground of the Middle Marsh, where settlement is nucleated, and dispersed settlement relating to drainage in the Outmarsh.
- Inland is a predominantly open, medium-scale agricultural landscape with mixed arable farmland in the Middle Marsh to the west. The Outmarsh, and smaller farm units with traditional pastures and occasional vegetable crops on the Outmarsh - nearer to the coast, also has medium-scale arable agriculture with pockets of traditional pasture.
- Traditional grazing marshes are a nationally threatened habitat with a distinctive landscape and cultural history. They need to be grazed, for example with cattle, and a range of cattle types are used including Lincoln Reds.
- Woodland and hedge cover is sparse but increases westwards towards the foot of the Lincolnshire Wolds with significant ancient woodland on the Middle Marsh. The substantial amount of ancient semi-natural woodland includes a number of Sites of Special Scientific Interest (SSSI) and nature reserves (such as Rigsby, Muckton and Legbourne). More minimal tree and hedgerow cover is found on the lower-lying, open Outmarsh.
- A complex series of rivers and small streams drains eastwards towards the sea. There are some natural watercourses such as the Great Eau and Waithe Beck, as well as a network of many manmade drainage ditches. The disused Louth Canal – a canalisation of the River Lud – extends as far as Tetney Lock.
- Many deserted medieval villages surviving under grass are found in this NCA. Reclaimed marshland and salt marshes contain traces of ridge and furrow (which are permanent pasture) and areas retain important evidence of medieval and later industry (for example, salterns) with evidence of ancient salt works.
- A dispersed settlement pattern is characteristic throughout much of the area with a concentration of larger settlement along the coast including resort towns. The port of Grimsby, once one of the largest fishing ports in the country, now acts as an important international freight link.

- Rural areas have a mix of dispersed and nucleated settlement; the latter concentrated in the Middle Marsh. Rural settlements and market towns are strongly characterised by the use of brick and pantile, as a result of extensive 18th- and 19th-century rebuilding, with some very rare mud and stud buildings. Stone was used in particular for churches and high-status buildings.
- Industrial areas are located in parts of the coastal strip, and there is some discordant development in certain areas, such as holiday resorts of bungalows and very extensive caravan parks. In places offshore and onshore wind turbines are present and distinctive on the skyline.
- The developed seaside resorts attract tourists to the coast. The undeveloped wild coast with inspiring long views, high levels of tranquillity and numerous nature reserves means that this area is important for access, recreation and green tourism.



Grimsby Dock Tower is a prominent feature on the docks with modern infrastructure now dominating the skyline.

Lincolnshire Coast and Marshes today

The Lincolnshire Coast and Marshes National Character Area (NCA) is a long, narrow band of flat, low-lying coastal plain located to the east of the Lincolnshire Wolds, adjacent to the North Sea. It is a predominantly rural, productively farmed area, shaped by modest changes in topography, tree cover and land use, with more dynamic changes associated with its long coastline. Despite a strong overarching character, the NCA can be divided into three distinctive landscapes, strongly shaped by their proximity to the coast – the Middle Marsh, the Outmarsh and the coast itself.

Small plantations provide shelter around the farmsteads and settlements of the Outmarsh. Larger blocks, including some areas of ancient woodland, accompany the settlements and historic parklands of the Middle Marsh. In the west the Middle Marsh is predominantly an arable landscape that gently rises up to the foot of the Lincolnshire Wolds and is more enclosed than other areas, with a significant higher woodland content. East of this, lies the 'Outmarsh', a land of predominantly flat pasture with wide, open views across long distances. Here a more ancient drained landscape exists and there is a relatively high proportion of grass and rough grazing. Traces of ridge and furrow can still be seen and field sizes are smaller. The fields around the Middle Marsh towns are a mixture of small, irregular ancient enclosures immediately adjacent to village cores and larger planned enclosures over the former open fields and commons. Many of the villages expanded during the 18th and 19th centuries, and their cores are characterised by buildings of this date built of red brick and pantile.



Agricultural landscapes make up much of the Lincolnshire Coast and Marshes NCA.

East of the Middle Marsh lies the Outmarsh. Here, a more drained ancient landscape exists and there is a relatively high proportion of arable farming, grass and rough grazing alongside occasional vegetable crops. Outmarsh settlements are a mixture of straggling linear villages along former east-west drove roads and isolated farmsteads set in 19th-century planned fieldscapes.

More extensive nucleated settlement is concentrated on the coast, formerly based around fishing and coastal industries; several of these settlements have expanded as holiday resorts in more recent times. Many settlements may also represent aggregations of former hamlets which have coalesced through 20th-century ribbon development along main roads. The coast itself comprises a wide, open area of beaches, sand dunes, salt marsh, mudflats and sea bank clay pits with long views and high levels of tranquillity between the holiday resort towns. This coastal area typically experiences constant change resulting from accretion and erosion.

Cretaceous Chalk underlies the NCA with later Quaternary sand, gravel and clay deposits laid down on top following glacial activity. In the Middle Marsh, these glacial tills give rise to seasonally waterlogged, fine loamy soils which are good for cereal production. The marine alluvium deposits of the Outmarsh have produced soils of a deep clay and calcareous nature and these fertile soils are suitable for cereals, vegetables and permanent grassland. Mixed with the clay and tills are more localised areas of outwash gravels. Occasional blow wells occur where sand and gravel lenses allow water from the Chalk to reach the surface.

The coast is characterised mainly by wide beaches backed by extensive salt marshes and dunes. At low tide vast sand flats are a key feature, arising because of the very slight gradient of the beaches in places. Artificial sea

defences have been created along much of the coastline, for instance at Grimsby and between Mablethorpe and Skegness. The Environment Agency's Lincshore⁴ (flood defence) scheme combats the decrease in sand levels and increased flooding risk caused by erosion of the Beaches and clay foreshore.

Between Cleethorpes and Mablethorpe, accretion has produced a wide shore of shingle banks. Here salt marsh occurs on the open shore between the sea and the dunes as a result of the offshore Sand Haile Flats which provide protection from the full force of the sea. The dunes are stabilised by marram grass, allowing plants such as bird's-foot trefoil, pyramidal orchid and viper's bugloss to become established. These in turn support an array of bees and butterflies, with the smaller insects hunted by dragonflies and robberflies that patrol the dunes. Sea buckthorn, hawthorn and elder cover much of the dunes and are an important habitat on this coastline for birds including dunnock and wren, for which they provide cover and nesting sites, as well as for summer visitors including whitethroat and willow warbler. In winter, visiting fieldfare and redwing feed on the berries.

The Lincolnshire Coastal Country Park is being developed between Sandilands and Chapel St Leonards to give better protection for wildlife through habitat creation, restoration and linkages, and enhanced facilities for visitors, providing a year-round green tourism destination.

Specific areas of the coast are protected and managed for wildlife, notably at Donna Nook between Saltfleetby and Theddlethorpe and at Gibraltar Point. Together, the sand, mud and salt marsh here provide food and refuge for the many birds that visit the shores from the Arctic over winter. Ringed plover and

⁴ Environment Agency Lincshore Scheme

sanderling eat the small sandhoppers and shellfish found at the sea's edge, while curlew probe the mud for lugworms, Brent geese graze the salt marsh grass and flocks of twite and snow bunting feast on the seeds of the salt marsh plants.

Other species include water shrew, natterjack toad and common lizard. A colony of grey seals is one of the largest in the country and this is an important area for breeding grey seals. South of Saltfleet Haven an ancient calcareous dune system contains freshwater marsh and maritime fen. South of Skegness at Gibraltar Point there is another series of extensive dunes and salt marshes.

The coast is in places internationally designated for nature conservation. Ramsar, Special Area of Conservation (SAC) and Special Protection Area (SPA) sites partly or entirely within the NCA include the Humber Estuary, Gibraltar Point, Saltfleetby and Theddlethorpe Dunes, The Wash and the North Norfolk Coast SAC. These areas are designated for their sand dunes, salt marsh and intertidal flats and reedbeds and for the large numbers of overwintering birds and significant colonies of breeding terns. The sites are also important for waders during the spring and autumn passage.

The underlying Chalk geology contains the large Lincolnshire chalk aquifer, the primary source of water in east Lincolnshire. A complex series of rivers and small streams drains slowly east across the plain towards the sea. Some are natural watercourses, for example the Great Eau and Waithe Beck, while others are heavily modified, such as the many drains and ditches and the Louth Canal. A number of 'soke dykes' are saline.

The Covenham Reservoir provides storage for times of low aquifer recharge and can be used to prevent saline intrusion. The reservoir attracts waterfowl and is used for recreation, such as water sports.

There is very little woodland in this NCA. A few large blocks of woodland exist, with some shelterbelts around farmsteads and broadleaved woodlands



An important grey seal colony within the NCA at Donna Nook National Nature Reserve.

with increased woodland cover towards the Lincolnshire Wolds. The Middle Marsh comprises regular rectilinear fields bounded by occasional hedgerows.

Cereal and cereal cropping predominates. Two areas of wooded open farmland persist, firstly around Claythorpe, and most noticeably around Brocklesby where the Wolds slide imperceptibly down to the clay drift landscape. Ancient woodlands are located on the Wolds Edge including at Rigsby, Muckton and Legbourne, while plantations are found elsewhere, such as on the Brockelsby estate. The arable farmland of the NCA supports an assemblage of birds including a number of declining farmland birds, mainly grey partridge, skylark, barn owl, corn bunting, yellowhammer, linnet and tree sparrow. The birds benefit from habitats such as the fragmented patchworks of grasslands, ditches, small copses, hedgerow trees and hedgerows, which are becoming increasingly well-managed. Woodland in the Outmarsh is almost non-existent except around farmsteads and settlement edges. Towards the centre of the Outmarsh field sizes are smaller and a more ancient drained landscape exists. There is a relatively high proportion of grass and rough grazing intermixed with large arable fields.

Towards the centre of the Outmarsh field sizes are smaller and a more ancient drained landscape exists and there is a relatively high proportion of grass and rough grazing. On the Outmarsh pastoral grazing marsh landscape was once common. Today the area includes some important grazing marsh but there has been a loss of permanent wet grassland and ridge and furrow. The Lincolnshire grazing marshes and pastoral grazing marsh are important landscapes providing resilient areas tolerant of some flooding and are a refuge for wildlife, including wading birds and water voles. Evidence of past land use is evident in the landscape with traces of ridge and furrow still visible, especially in the Outmarsh.

Much of the coast is undeveloped and is managed as nature reserves and is under agri-environment schemes – Tetney Marshes, Donna Nook, Saltfleetby-Theddlethorpe, Sea Bank Clay Pits, Huttoft Marsh, Anderby Marsh, land between Wolla Bank and Chapel Six Marshes, and Gibraltar Point.

The Lincolnshire Coastal Country Park is an extensive area covering the land from Sandilands to Chapel St Leonards.

In the Middle Marsh, Gunby Hall, Well Vale Hall and Brocklesby remain as large houses with surrounding parklands and there are several fine houses in the suburbs of Cleethorpes, reflecting the wealth produced by the fishing industry. Three windmills remain in working order at Alford, Burgh le Marsh and Waltham.

Historic market towns include Alford, Burgh le Marsh and most notably Louth, which all retain their historic character. Louth is located at the foot of the Wolds and its parish church is notable for its Lancaster stone and 100-metre spire. Churches are prominent throughout and a number of particularly isolated churches can be found in the landscape.

More extensive nucleated settlement is concentrated on the coast, formerly based around fishing and coastal industries before expanding as holiday resorts and here the extent of 20th-century settlement has been considerable. Grimsby, famous for its fishing heritage, docks and prominent dock tower, expanded as the docks thrived and absorbed outlying villages.

Today, Greater Grimsby is home to one of the largest concentrations of food manufacturing, research, storage and distribution in Europe. The freight port

of Grimsby and Immingham remains important with its associated industry; The docks and oil refinery at Immingham, although in the adjacent Humber Estuary NCA dominate the skyline for miles and create a major intrusion on the flat Outmarsh. On the coast, Cleethorpes, Mablethorpe and Skegness developed as tourist centres for holiday makers from the East Midlands over the last century or so. The Victorian and Edwardian villas of the towns have been added to during the 20th century by clusters of caravans, mobile homes, holiday camps and theme parks along much of the coastline. Most of the built coastline between Mablethorpe and Skegness is now protected by concrete sea defence walls built following numerous floods. This stretch of coast includes the Lincolnshire Coastal Country Park.

The area is popular for its recreational opportunities and has seasonal visitors-particularly along the coastal strip. The area provides opportunities for swimming, relaxation and inspiration and its beaches are busy, especially during the summer months. A collection of extensive nature reserves attract people -especially for bird watching during the bird migrations and seal watching is also popular.

New development and infrastructure, such as around the Port of Grimsby and Immingham has impacted on this very open landscape. Grimsby and Immingham combine to form the UK's largest port by tonnage, handling 50 million tonnes of cargo annually. There are also passenger ferries to Europe from the port. Although retaining strong traditional connections to the fishing and food industry, Grimsby's major focus is on the handling of imported cars. Investment has been made in the development of the Grimsby Riverside Terminal. There has been a growth in infrastructure in relation to the operations and maintenance of the renewable energy industry.

The docks and oil refinery at Immingham, although in the adjacent Humber Estuary NCA, noticeably dominate the skyline for miles and create a major intrusion on the flat Outmarsh. New development and infrastructure, such as around the Port of Grimsby and Immingham, have impacted on this very open landscape. Modern wind turbines are also very noticeable on the skyline in the open landscape. Individual turbines are found and also groups of them, particularly on the coast where the various offshore wind farms are very prominent.

Further south on the coast, Cleethorpes, Mablethorpe and Skegness developed as tourist centres for holidaymakers from the East Midlands from the early 20th century. There are Victorian and Edwardian villas in the seaside towns, giving a strong sense of historic character. During the 20th century development around towns (especially Skegness) included caravan parks, mobile homes, holiday camps and theme parks. Most of the built coastline is protected by concrete sea defence walls which have been built following numerous floods such as those in 1953.

The coastal area is popular for its recreational opportunities and has seasonal visitors. The coastal strip provides opportunities for walking, swimming, relaxation and inspiration. Resort beaches are busy, particularly in peak season, but others along the undeveloped coast are quiet. Numerous extensive nature reserves attract visitors along the coast, especially for bird watching during migration, and seal watching is also popular. In addition to the National Nature Reserves (NNRs), there are areas such as the Lincolnshire Coastal Country Park which is being created as an area for people and wildlife along the undeveloped coast.

The landscape through time

In geological terms, the coastal plain is relatively recently established, having been formed predominantly through glacial processes over the last 2 million years. Cretaceous Chalk underlies the whole area and is deeply buried beneath Quaternary sand, gravel and clay deposits which thicken towards the coast.

The area was subject to two major glaciations. The first was the Anglian Glaciation 450,000 years ago, which covered the entire area in ice. As temperatures rose and this ice sheet retreated, the rise in sea level cut a coastline along the eastern edge of the Wolds. The original cliff-line can be found along the Lincolnshire Wolds, over 20 km inland from the current coast. The second occurred about 115,000 years ago with the start of the Devensian ice age and once more the NCA's ice cover was limited to the east by the Lincolnshire Wolds, which remained exposed in a tundra environment. Again, warming led to the retreat of the ice, leaving extensive deposits of glacial clay, sand and gravel. Melting water led to flooding and the development of the present low-lying coastline and associated peat, marsh and marine deposits during the Holocene.

As the ice melted, glacial tills were deposited across the outwash plain, forming the Middle Marsh. As the last ice sheet to cover the land left the area, some 15,000 years ago, it left behind vast swathes of glacial deposits and, as sea levels rose, deposits that lay on the seabed were re-worked and moved landwards. By contrast, the Outmarsh is composed of marine alluvium and it is of a similar character to most of the central fens, being created by higher sea levels following the ice age. Until the 13th century, the coastline was most likely protected by a line of offshore islands of moraine from the retreating

ice sheet. These barriers of glacial tills gave relief from coastal erosion and allowed the development of extensive lagoons and marshes.

The influence of the North Sea on the landscape has affected the use of the land for many centuries. Early settlement took place on the higher ground of the Middle Marsh, with evidence of prehistoric and Roman salt-making found throughout the area. Grazing and salt-making have long characterised the Outmarsh, which prior to the spread of wetland areas from the Bronze Age consisted of lakes, marshes, islands and woodland. Wetland areas spread inland as sea levels rose and the climate cooled over the Bronze Age. Remnants of the petrified forest of Wolla Bank can be found today.

The earliest settlers found the elevated land of the Middle Marsh more attractive than the coast and a string of villages formed along the Townlands Ridge on the ancient boundary between dry land and coastal wetlands. Village names ending in 'by', as in Thoresby, and 'thorpe', as in Grainthorpe, indicate that the Danes were the main settlers. Much of the evidence relating to the prehistoric use of the land remains buried under the silts that have subsequently been deposited across the landscape. In Roman, medieval and post-medieval periods, the settlers began to drain and reclaim the land from the sea, establishing significant coastal salterns and improving the land to create rich pasture fields to fatten livestock from the Wolds. Today's network of narrow ditches and dykes along the Outmarsh, as well as the ancient irregular field patterns, are testament to these past improvement works.

The earliest phase of reclamation that can be seen is the result of medieval salt making along the former coastlines. The process of salt-making created large quantities of spoil, made up of sand and silt, which was disposed of

on large mounds. As the saltern mounds grew in size and number, so the sea receded, and new settlements were founded, such as between North Somercotes and Saltfleet. Medieval and post-medieval salt workings are found at Tetney and Somercotes, and in locations exposed by dyke clearance works which date from earlier periods. Other remaining evidence of medieval settlement includes the earthworks of religious houses such as Louth Abbey, Hagnaby Abbey and Markby Priory, as well as moated sites marking the locations of manors, homesteads, farms and granges.

In the 12th century the coastline south of Grimsby was several kilometres further inland. However, settlers slowly drained and reclaimed the land for common grazing on the marshes and this period into the 13th century saw the expansion of reclaimed farmland along the Outmarsh zone, including numerous holdings often still termed 'grange' related to the area's abbeys and priories. The area retains a high percentage of small, mainly pastoral fields related to the historical practice of fattening of cattle. There was considerable wealth in the region and at the height of the wool trade in the 14th century many fine churches were built in local stone, such as Lower Cretaceous Spilsby Sandstone.

The marshland of the Lincolnshire coast provides excellent grazing during the summer months, and allowed fattening of large numbers of cattle and sheep. This was exploited both by the farmers of the Middle Marsh and by those from further afield, including flocks from Scotland and Ireland. Land in the marsh was often rented or purchased by farmers from the Lincolnshire Wolds, who would drive livestock down from the hills to the coast. Thus there is a close cultural connection between the Wolds and the Lincolnshire coast and marshes, most clearly seen in the arrangement of drove roads which run east-west through the area.



Churches such as this leaning example at Skidbrook, are one of many historic assets giving character to the NCA.



Saltmarsh habitats such as these near Cleethorpes are valuable and relatively undisturbed.

Since the 18th century, the agricultural landscape has become more complex, supporting mixed cereal, vegetable and some root cropping as well as pasture. Large-scale re-organisation of the fieldscapes of the Middle Marsh took place in the 18th and 19th centuries, along with the rebuilding of the area's settlements and the relocation of farmsteads to new sites among newly enclosed fields. Land and salt marsh have continued to be reclaimed over time with the areas that are now Saltfleet and Somercotes reclaimed in the 19th century. There are several active and relict sea banks in the area aligned parallel to the coast, showing that settlements along the coastline have long been defended. The marshes, along with other areas of rough grassland on the seaward side of the defences, have traditionally been grazed.

Much of the coast is still made up of salt marsh and dune systems which are well preserved. The Sandhills Act of 1932 effectively controlled the expansion of built development on the coast at Gibraltar Point and Saltfleetby and much preservation can be attributed to the presence of the Royal Air Force bombing ranges along the coast and, more recently, to the establishment of a number of nature reserves. Much of the built coastline, such as between Mablethorpe and Skegness, is protected by massive concrete sea walls following the floods in 1953.

In terms of the local vernacular, bricks have largely replaced the once prevalent mud and stud, with the occasional reed thatch surviving, such as at Alford. Links to the brick-making industry can be found with local clay pits within the NCA making this an important centre for clay pantile production in the 18th century. Traditional building materials are brick and pantile, and result from extensive rebuilding in the 18th century. For example, Louth still retains the elegant red-brick Georgian town houses of Westgate which cluster

around its church, small squares and market hall. A few traditional windmills can also be found, for instance at Alford, Burgh le Marsh and Waltham.

The Louth Canal – now disused – is a heavily modified water body with its distinct embankments; it was built in the 18th century as a canalisation of the River Lud, linking the more inland areas, including the historic market town of Louth, to the coast near Tetney to transport coal and corn to the coast.

The development of holiday resorts at Skegness, Mablethorpe and Cleethorpes led to the Lincolnshire coast becoming a renowned tourist destination. North Somercotes and Saltfleet were encouraging sea bathing by the 1790s and at Mablethorpe sea bathers are recorded from the early 19th century, when it was described as a fashionable ‘watering place’.

The wealth of the fishing industry was very important on this coast and expanded quickly. The first true fish dock opened in Grimsby in 1856 and from then on the town was at the forefront of the development of the fishing industry. By 1900, a tenth of the fish consumed in the United Kingdom was landed at Grimsby. The town quickly became known as ‘Great Grimsby’, with its rapid development and the arrival of the railway in 1848. Grimsby’s port boomed, importing iron, timber, wheat, hemp and flax, and exports included coal. Its docks were some of the busiest in the world and with its good rail links to London, ‘Grimsby fish’ gained renown nationwide.

The fishing industry focused on fresh catches such as cod and herring and later the frozen fish industry developed and remains important. Grimsby now also specialises in smoked fish and its fishing heritage is well recognised today.

Throughout the 20th century increased production and an intensification of farming led to a predominance of cereal crops in the landscape and newer crops such as oilseed and maize, particularly in the Middle Marsh. The ploughing and draining of land intensified and has resulted in some significant damage to buried archaeological artefacts as well as the characteristic historical landscape features such as ridge and furrow. Areas of historic parkland decreased significantly during the 20th century, although there are important areas remaining at Gunby Hall, Well Vale Hall and Brocklesby under favourable management.

First and Second World War anti-invasion defence works were constructed along the Lincolnshire coast. Remains include concrete pillboxes, tank traps, searchlight batteries and gun emplacements. Many installations survive largely unaltered today, creating a strong sense of history along the coastline.

The extent of 20th-century settlement has been considerable along the coast and there is new infrastructure. There has been infill development in relation to the coastal resorts including many bungalows along the built-up areas of the coastal strip such as around Skegness and/ Ingoldmells and at Trusthorpe. However, the greatest development has occurred around Grimsby with industrial expansion around the seaport and developments in connection with the port of Immingham. The expansion of the frozen food industry has been dramatic and the town has experienced great change and also periods of decline. More recent developments include the offshore wind farms which have impacted on the area as have onshore wind turbine installations and gas terminal and pipeline infrastructure.

Ecosystem services

The Lincolnshire Coast and Marshes 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 Lincolnshire Coast and Marshes NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

■ **Food provision:** Extensive areas of fertile soils support arable farming systems, with cereal production forming the greatest land use. Of the soils only 4 per cent is Grade 1, with 16 per cent Grade 2 agricultural. This land is found mainly on the lower slopes of the Wolds along the western edge. Some 71 per cent of the area is Grade 3 land, some of which is farmed to produce vegetables and root crops as well as a mix of arable crops including oilseed.

This is a landscape dominated by arable production – wheat and oilseed rape – followed by grassland or root crops. It is a producer of beef, lamb and milk with small beef and dairy herds. Lincoln Red cattle, the native breed of Lincolnshire, are adapted to coastal grazing marshes.

■ **Water availability:** The chalk aquifer underlies the NCA and is one of the most important sources of water for the Yorkshire and Humber and East Midlands regions. It is used extensively by businesses and agriculture and for public and private water supply. The groundwater is, however, over-abstracted as there is a high demand for water to irrigate crops.

There are a number of rivers in the NCA including the Great Eau, the Steeping and the River Freshney which rise in the adjacent Lincolnshire Wolds. The rivers have an over-abstracted status and where Catchment Abstraction Management Strategy (CAMS) assessments have been undertaken their status is assessed as having 'no water available'.

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

- **Climate regulation:** Long-term storage of carbon is provided by areas of salt marsh, mudflats and coastal marine sediments, reedbeds, permanent grassland and grazing marshes. There is relatively little woodland in the NCA and there is low soil carbon content throughout most of it, especially where there is extensive arable cultivation.
- **Regulating water quality:** The majority of rivers within the NCA have been assessed for surface water status. For their ecological class, 48.3 per cent of waterbodies are classified as moderate, 30.3 per cent as good, 19.6 per cent as poor and 1 per cent as bad. (The remaining areas had not been assessed.)

In terms of the Water Framework Directive, the transitional waters and coast have been assessed and are classed as moderate. The lake at Chapel Pit was classified as good while Covenham Reservoir was classified as poor. All the coastal bathing waters, including those at Humberston Fitties, meet the Bathing Water Guideline.

Some 82 per cent of the NCA falls within a nitrate vulnerable zone and 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).

- **Regulating soil quality:** Glacial tills across the Middle Marsh on the western side give rise to permeable, seasonally waterlogged, fine loamy soils. To the east, the Outmarsh's marine alluvium deposits produce soils of deep clay and fertile soils of a calcareous character. However, 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. 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 are easily poached by livestock and compacted by machinery when the soil is wet. Any 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 flow:** The NCA is mainly low lying. The Environment Agency flood risk maps⁵ indicate that the majority of the NCA is at high risk of river and/or coastal flooding. Flood control is a key issue for most of the NCA, particularly since the major flooding events in 1953 and the surges and flood warnings in 2013.

Settlements are offered some protection by flood defences. However these

give rise to coastal squeeze' whereby intertidal habitats are lost between the rising sea levels and the flood banks. This can be addressed by managed realignment to enable the continued expansion of intertidal habitats.

Flooding can affect properties, businesses, transport, infrastructure and farming. The agricultural productivity of the area is dependent on pumped drainage as it would be naturally waterlogged for much of the time.

The managed realignment of modified watercourses, for example the development of Washlands at Manby and more recently reconnecting the Great Eau with its floodplain on land near Saltfleetby.

- **Regulating coastal flooding and erosion:** Important coastal processes occurring within the NCA and beyond involving accretion and coastal erosion are taking place. Sediments from the North Sea are drawn in and out and this process needs to be maintained. The process contributes to habitats along the coast – formed of mudflats, salt marshes, sand dunes and which provide internationally important habitats as well as important natural sea defences, backed by manmade coastal defences.

The Environment Agency has been running major coastal flood defence schemes to reduce flood risk to homes and businesses on the Lincolnshire coast.

Sea level rise and more frequent storm events may exacerbate coastal erosion and increase the scale of flood events. Climate change presents a challenge to how we regulate and/or change the balance.

⁵ Environment Agency flood risk maps. The Humber Flood Risk Management Strategy, Environment Agency (March 2008)

Cultural services (inspiration, education and wellbeing)

- **Sense of history:** The open character of the area, with its distinctive boundaries and range of natural and historic features, including the characteristic salterns, retains a strong sense of having been reclaimed from the sea.

Medieval and post-medieval features are present on the marshes. Monastic sites and granges and moated sites with some deserted settlements bear witness to 12th–13th-century reclamation and land use, and the subsequent contraction of settlement. Similarly, 18th–19th-century farmsteads and fieldscapes bear witness to later agricultural improvement.

Historically, the coastal salt industry was very important and influenced the historic routes across the coastal areas. The sediments themselves contain a record of ancient landscape and climates, with the currently wasting peat revealing well-preserved remains of prehistoric landscapes with especially rich archaeology. Archaeological features are present beneath the clays and silts and at high tides, and evidence of ancient forests in exposed intertidal areas has been found.

The coast with its anti-invasion defences provides a sense of history during the two World Wars and contributes to our understanding of the area and its recent history.

- **Tranquillity:** The highest scores for tranquillity are found in the more rural, isolated areas away from settlements and transport networks. 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 sea views.

The proportion of areas that are disturbed remains low, with tranquillity reduced around expanding urban settlements and main transport corridors. Grimsby and Cleethorpes have the lowest scores for tranquillity. Louth, Alford, Mablethorpe and Skegness also have comparatively greater disturbance than more rural areas.

- **Recreation:** A variety of recreational opportunities exist here including walking, fishing, water sports, kitesurfing, sea fishing, cycling, bird watching and, in the summer, sunbathing and swimming. The area hosts many 'Blue Flag' beaches on its popular coast (including those at Cleethorpes, Skegness, Mablethorpe and Sutton on Sea). The Lincolnshire Coastal Country Park is a popular tourist destination and there are increasing opportunities for green tourism.

Public rights of way are limited and only 1.4 per cent per cent of the NCA is publicly accessible. New national coastal access routes are planned and there are opportunities to develop local walks to build on existing routes.

The settlements of the north Lincolnshire coast have a number of sites with recreational opportunities and limited public access routes. Where there are pockets of deprivation (as measured by the Index of Multiple Deprivation), more greenspace, recreational opportunities and improved access to greenspace can help to improve the health and wellbeing of the local community.

- **Biodiversity:** This NCA is particularly important for its biodiversity and has coastal areas designated as Ramsar sites for their internationally important bird populations.

Areas have been designated as SAC and SPA owing to their varied coastal habitats and for the large numbers of wintering wildfowl and nationally important and diverse range of bird species on the Humber Estuary and The Wash. The area is also home to an important colony of grey seals and supports common seals

Many different habitats including saline lagoons, mudflats, salt marshes and sand dunes support important populations, for example the Cleethorpes sand dune complexes, Gibraltar Point and various NNRs.

The area is important in terms of the wetland habitats and associated species – for instance, it is a key area for protected species including water vole⁶ and rare wetland plants. Other species of note are present in the NCA, including natterjack toad.

The grazing marshes hold valuable habitats and support waders and ground-nesting birds. The NCA also contains arable habitats that are valuable for supporting nationally important farmland bird populations – bird species found here include the Arable Assemblage for the East Midlands.

- **Geodiversity:** The wealth of geodiversity interest in the NCA is in part linked to its location on the coast and in particular its geomorphology and complex patterns of erosion and accretion. The Lincolnshire Coast and Marshes NCA falls within the Flamborough Head to The Wash sediment cell and is within the same sediment cell as the Holderness and Humber Estuary NCAs. The mouth of the Humber is important for its associated sands and mudflats and shifting geomorphology. The more recent Holocene deposits along the coast, notably at Chapel Point to Wolla Bank Site of Special Scientific Interest, provide a lot of information about the recent rise and fall of sea levels and the associated environmental change.

Gibraltar Point is a very dynamic part of the East Coast and, in contrast with many parts of eastern England, it is still accreting. The innermost part of its pair of almost parallel dune systems separated by salt marsh is believed to be at least 300 years old.

Clay pits occurring in the area, for example at Goxhill, have traditionally provided an important centre for clay pantile production since the 18th century. There are also borrow pits formed when defences reinforced post 1953 floods particularly Sea Bank Clay Pits SSSI.

⁶ Regional Water Vole Key Areas 2006–2010, Wildlife Trust

Statements of Environmental Opportunity

SEO 1: Safeguard, manage and enhance the dynamic coastal landscape producing net gains in extent and quality of internationally and nationally important habitats including sand dunes, salt marsh, mudflats, saline lagoons, reedbeds and grazing marsh for the wildlife they support, to increase ecological resilience and to increase the landscape's ability to mitigate flood risk and climate change.

For example, by:

- Protecting intertidal habitats and dune formations (among the best of their type anywhere in the UK) including saline lagoons, and ensuring that they are adequately managed.
- Seeking opportunities to increase the extent of sand dune habitats and manage them for their species, in particular ensuring that they are adequately protected.
- Seeking opportunities to increase the extent of intertidal habitats – including salt marsh, 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 sand dunes such as those in the National Nature Reserves (NNRs), including Gibraltar Point, to evolve as naturally as possible with limited intervention, maintaining access to key facilities with minimal interruption to natural coastal processes.
- Providing access to sites of geological or geomorphological interest and providing interpretation, to raise awareness and improve understanding of the dynamic processes under way.
- Monitoring and researching natural and man-influenced coastal processes to improve understanding and working with partners to find ways of helping these dynamic processes to ensure no net loss of features.
- 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 coast and estuary and contribute to its expansive landscape character.
- Working in partnership, informed by the Shoreline Management Plan,⁷ to ensure that dynamic coastal processes continue and to conserve the range of coastal and wetland habitats that contribute to landscape character and support the wide range of wildlife.
- Conserving and managing the nationally significant coastal and marsh landscape, implementing strategies to adapt to coastal change and sea level rise.
- Planning for the effects of coastal change: allowing the operation of natural coastal processes and the creation of new habitats, to maintain and enhance local landscape character and biodiversity; improving the sustainability of current management practices; and reducing flooding in built areas.

⁷ Flamborough Head to Gibraltar Point Shoreline Management Plan: Humber Estuary Coastal Authorities Group (2009)

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- Seeking opportunities to develop joint strategies in relation to the delivery of the Shoreline Management Plan and Catchment Flood Management Plans, ensuring that flood risk and waterways are managed effectively to protect settlements.
- Encouraging natural coastal processes to allow dynamism and natural sediment movement so that habitats and species can naturally extend and adapt in order to help them to become resilient to natural coastal processes. In appropriate areas along the coastline, allowing essential sediment transportation to create intertidal habitats and natural sea defences and enhance the landscape character of the coast.
- Ensuring that managed realignment sites and new flood storage areas are managed to create wetland habitats that contribute to landscape character and biodiversity, with some public access.
- Safeguarding the geological and current geomorphological processes, particularly along the internationally important coastline. Where possible, allowing the unimpaired operation of natural coastal processes, resulting in the creation of new habitats, conserving and enhancing landscape character and benefiting biodiversity and the historic environment.
- Raising awareness of the importance of the roosting and feeding areas for birds around the coast, ensuring that these areas are adequately protected and managed.

- Working in partnership to accommodate large numbers of overwintering birds and significant colonies of breeding terns. The feeding and wintering habitats are required for internationally important numbers of birds and waders during the spring and autumn passage periods. Many of the birds essentially feed outside the Special Protection Area in nearby waters and roost and feed inland at high tide.



Wading birds, such as lapwing (green plover), will breed in the Outmarsh.

SEO 2: Conserve and enhance the historic features and settlement character of the dispersed rural villages and market towns of the Middle Marsh and Outmarsh and the fishing heritage of the port of Grimsby. Encourage a strategic approach to land use planning to conserve and enhance the historic landscape and heritage features, encouraging initiatives which contribute towards green tourism, enhance green infrastructure links, manage the pressures of flood risk and climate change, and ensure that infrastructure developments, such as offshore wind turbines do not contribute negatively to the character of the area.

For example, by:

- Raising awareness of the historic environment and character of the area and how it results from millennia of human and natural factors.
- Conserving and enhancing the heritage features and assets of rural areas and towns, from prehistoric sites to the fishing heritage of Grimsby.
- Working in partnership with landowners and farmers to conserve and enhance the landscape and protect the heritage assets and landscape features in the environment of the coast and the marsh.
- Addressing past losses of grazing marsh by providing incentives for retaining remaining habitat and restoring and creating additional areas to ensure habitat is available for breeding and wintering wetland bird populations and populations of other species which benefit from a pastoral landscape.
- Managing, expanding, buffering and linking the existing ancient woodlands on the border of the Wolds and Middle Marsh.
- Conserving and managing the few remaining species-rich lowland meadows in the area.
- Managing watercourses to provide clear biodiversity benefits for wetland species such as water voles for which this area is a national stronghold.
- Managing the historic environment for its contribution to local character and sense of identity and as a framework for habitat restoration and sustainable development.
- Supporting the strategic approach to assimilating new industrial development, in particular on the coast, to ensure co-ordination of changes so that the internationally significant biodiversity is protected and enhanced.
- Seeking opportunities to establish strategic habitat mitigation areas to ensure that the impact of future growth and development on the estuary is appropriately managed and compensated for. Seeking opportunities for biodiversity offsetting.
- 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, thus ensuring that industrial sites have areas that are 'permeable' and can link with networks of connected habitats.
- Halting the expansion of intrusive caravan sites within the open/undeveloped coast which impact on the character of the area.
- Ensuring that planning decisions adequately address the vital role that areas landward of the flood defences play in supporting the

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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.

- Encouraging nature conservation management and the conservation of geological features.
- Seeking to enhance and extend habitats, creating a sustainable network for wildlife. Enhancing the simple patterns of fields, woodlands, ditches, rivers and tributaries and their strong links to past land use and settlement. This will bring benefits in terms of reducing soil erosion, improving soil quality and water availability, regulating water flow, promoting the interpretation of the historic environment, enhancing biodiversity and supporting pastoral farming.
- Seeking opportunities where appropriate to plant trees and create small areas of woodland to reduce flood flows. Such woodland areas and semi-natural areas will assist in reducing rapid run off of water during high rainfall.
- Protecting the Lincolnshire Wolds Area of Outstanding Natural Beauty (AONB) and working in partnership to implement the adopted Lincolnshire Wolds Management Plan 2013–2018 (a small part of the Lincolnshire Wolds AONB is located in the National Character Area (NCA)).
- Protecting the Lincolnshire chalk streams and associated habitats which are important in terms of Biodiversity 2020.
- Protecting the flat, open, low-lying Outmarsh for its remote and tranquil character which is enjoyed by walkers, its archaeological assets which provide a link to the past, and its drained pasture fields.
- Adopting the area's traditional and historic architecture and its distinctive patterns of settlement to plan for and inspire new development, using appropriate local building materials and vernacular styles in restoring buildings and structures.
- Enhancing green infrastructure links within the area, especially within and beyond the towns, ensuring that there are places to benefit people and wildlife.
- Exploring opportunities for and encouraging green tourism.
- Improving access to the coast for walking, cycling and disabled people through the sustainable use of old railway lines, tracks and paths and encouraging reduced car use. Securing opportunities for the public to enjoy the natural environment through the implementation of the England Coast Path while ensuring appropriate protection of it.
- Ensuring promotion of access opportunities educates people about the vulnerability of the coastal habitats in the NCA and encourages visits of a low-impact nature which avoid any adverse impacts on agricultural management, landscape, habitats and wildlife.

SEO 3: Ensure sustainable food production while enhancing and strengthening the network of farmland features; manage, expand, create and link habitats within the Outmarsh and Middle Marsh to benefit biodiversity, soil and water quality by promoting farming and forestry practices that are able to adapt to climate change. Manage the rivers, water levels and the provision and quality of water in the whole catchment for human and ecological benefit.

For example, by:

- Promoting sustainable but productive farming practices that are able to adapt to changing agricultural economics and climate change including maintenance of remaining permanent pasture. Important not only for wildlife but also carbon storage and also historical environment where there is ridge and furrow.
- Working in partnership to ensure that water levels are carefully managed to provide multiple benefits such as protecting wetlands and watercourses which are vulnerable to abstraction, reducing flooding, vegetation succession and altered land management. Managing and expanding the wetland habitats, including wet pasture, fens and reedbeds and, where appropriate, wet woodland. Creating washlands and wetland priority habitats within them, where appropriate.
- Seeking opportunities to maintain and improve water quality and provision from the chalk aquifer by working with farmers and land managers to adopt practices that improve filtration into the ground and reduce nutrient run-off.
- Managing the priority habitats such as the chalk streams and blow wells and associated adjacent areas.
- Creating buffer zones and other measures to reduce erosion and pollution of the wider environment. Reducing the use of pesticides and other chemical/nutrient inputs, resulting in less diffuse pollution. Complying with regulations on nitrate vulnerable zones which cover the majority of the NCA.
- Conserving productive soils for continued agricultural production while ensuring that the agricultural landscapes make a greater contribution to wildlife, especially farmland birds, and avoiding or reducing cultivation where there are archaeological features.
- Creating, expanding and linking habitats to benefit biodiversity, including grazing marsh.
- Conserving, managing and expanding semi-natural habitats that reveal the influence of underlying soils and hydrological conditions.
- Encouraging agricultural practices such as planting winter cover crops, infield grass areas to prevent run-off, permanent grassland with low inputs and buffer strips on cultivated land adjacent to uncultivated land.
- Enhancing the network of habitats and farmland features: managing hedges, hedgerow trees, watercourses and farm ponds. Encouraging linear habitats and sympathetically managing boundary features as corridors and stepping-stones. Hedge planting as well as restoration should be encouraged – especially where many of the older small grass fields are surrounded by hedges.
- Planning for new woodland planting only at appropriate locations, especially where this would be beneficial in creating new green infrastructure routes or integrating new development into the landscape. Woodland planting would be restricted mainly in the western edge of the Middle Marsh where woodland forms part of the existing landscape character.

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- Planting individual trees in the Outmarsh rather than woodland in order to avoid changes to the existing landscape character and to retain the open views.
- Carefully managing historical assets including areas of ridge and furrow in the environment.
- Creating a mosaic of productive land, with healthy ecological networks of semi-natural and managed habitats, which can meet food supply demands without the loss of associated species.
- Restoring and creating habitats, with appropriate traditional management techniques in place – especially using more traditional breeds of livestock.
- Encouraging partnership work and, benefiting from the experiences of the Lincolnshire Coastal Grazing Marshes Project and which has concentrated on target areas in the southern part of the NCA. Retain and manage remaining areas, increasing of wet grassland and redress recent losses by providing incentives to increase the amount of wet grassland and grazing marsh as lowland meadows have been lost to alternative farming systems and wildlife-rich and pastoral grassland is an important element of Greater Lincolnshire's biodiversity.
- Managing natural rivers for water quality, water availability and biodiversity. Managing the network of catchment drains, dykes and canals for improved water quality, water availability and their contribution to biodiversity.
- Managing the reservoirs through reducing saline intrusion, aiding aquifer recharge, and developing these for recreational opportunities.

- Protecting the mosaic of terrestrial habitats for birds' roosting, feeding and breeding.



Cattle grazing on the marshes, here with rig and furrow.

SEO 4: Conserve and enhance the character of the traditional seaside resorts and the long sandy beaches which help to make the area an important tourist destination; improve opportunities to enhance people's enjoyment of the undeveloped areas along the wild coast with its expansive coast and marsh landscape and its coastal features and wildlife, while protecting high levels of tranquillity and the extensive, open views both inland to the Wolds and also out to sea.

For example, by:

- Working in partnership with landowners and farmers to achieve mutually satisfactory objectives, managing and promoting opportunities for sustainable access and outdoor recreation.
- Implementing strategies to adapt to coastal change and sea level rise, while improving people's enjoyment of the area through enhancing its unique assemblage of coastal habitats and increasing opportunities for sustainably managed access.
- Developing initiatives to encourage access to and engagement in local greenspace and the wild coast, providing recreation and health benefits. Incorporating greenspaces into any new developments to ensure a connection with semi-natural habitats in order to benefit wildlife while providing opportunities for recreation – such as in Grimsby, Cleethorpes, Mablethorpe and Skegness.
- Retaining the open character of the landscape with its expansive views and big skies. Protecting areas with a strong sense of remoteness, wildness and tranquillity and dark skies.
- Conserving quiet rural areas by encouraging sensitive development, respecting long and open views and enhancing the character of rural settlements and traditional buildings.
- Improving opportunities to enhance people's enjoyment of the open, expansive coast and marsh landscape and its coastal features and wildlife, extending the traditional visitor season, while protecting high levels of tranquillity.
- Raising awareness of the important sensitive habitats and the wildlife that the coastal environment supports such as coastal dunes, tern, and common and grey seals.
- Offering opportunities for improved health and wellbeing by providing public access to the natural environment from the urban areas and coastal resorts and improving the rights of way network and links to the countryside and coastal resorts. Exploring opportunities for coastal access and improving links to and engagement with the coastal country parks and other countryside sites.
- Protecting open views and the simple, open character of the landscape and seascape, enhancing access to and interpretation of the wealth of natural and heritage assets, and recreational opportunities, throughout the area (including the NNRs, the Lincolnshire Coastal Country Park and AONB).
- Developing a continuous stretch of coastal habitat behind the dunes between Chapel Point and Sandilands via the Lincolnshire Coastal Country Park.
- Planning for new development in larger settlements to be in keeping with existing character, well designed and sited to reduce visual intrusion. Adopting the area's traditional and historic architecture

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and its distinctive patterns of settlement to plan for and inspire new development. Using appropriate local building materials and vernacular styles in restoring buildings and structures.

- Seeking opportunities to improve green infrastructure links to the AONB which overlaps the adjacent Lincolnshire Wolds NCA and working in partnership to implement the adopted Lincolnshire Wolds Management Plan 2013–2018.
- Recording, managing and protecting the cultural and historic landscape associated with the area and also understanding and exploring the related key communication and trading routes. Improving heritage education opportunities and interpretation, working with and through local partnerships and communities.
- Protecting the important and accessible 'Blue Flag' beaches on the coast which are essential to tourism. Ensuring that the coastal dunes are conserved and protected from damage resulting from recreational pressure, through the development of a strategy for coastal public access management.
- Conserving and enhancing the remaining character of the East Coast seaside towns and resorts to improve them for the local community and to increase their attractiveness as tourist destinations.



The coast is particularly popular and many visitors enjoy the beaches for example at Mablethorpe.

Supporting document 1: Key facts and data

Total area: 88,201 ha

1. Landscape and nature conservation designations

Around 3 per cent of this NCA lies within the Lincolnshire Wolds Area of Outstanding Natural Beauty (AONB).

Management plans for the protected landscape can be found at:

- www.lincswolds.org.uk/

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Designated site(s)	Area (ha)	Percentage of NCA
International	Ramsar	Humber Estuary; Gibraltar Point	2,480	3
European	Special Protection Area (SPA)	Humber Estuary SPA; Gibraltar Point SPA;	2,480	3
	Special Area of Conservation (SAC)	Humber Estuary Saltfleetby – Theddlethorpe SAC; Dunes and Gibraltar Point SAC; The Wash and North Norfolk Coast SAC	2,570	3
National	National Nature Reserve (NNR)	Donna Nook NNR; Saltfleetby-Theddlethorpe NNR; Gibraltar Point NNR	1,095	1
National	Site of Special Scientific Interest (SSSI)	A total of 15 sites wholly or partly within the NCA	2,706	3

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 199 local sites in the Lincolnshire Coast NCA covering 2,113 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> – select ‘Designations/Land-Based Designations/Statutory’

1.1.1 Condition of designated sites

Condition category	Area (ha)	Percentage of SSSI land in category condition
Unfavourable declining	0	0
Favourable	2,103	78
Unfavourable no change	0	0
Unfavourable recovering	603	22

Source: Natural England (March 2011)

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

2. Landform, geology and soils

2.1 Elevation

Elevation ranges from just below sea level to a maximum 87 m as the land rises westwards across the Middle Marsh to the foot of the Lincolnshire Wolds. The average elevation of the landscape is 11 m above sea level.

Source: Natural England 2010

2.2 Landform and process

The wide coastal plain can be divided into three sub-areas which run broadly parallel with the edge of the Wolds. To the west is the Middle Marsh which comprises a softly undulating arable landscape that gently climbs up to the foot of the Wolds at the ancient Barton Street. To the east lies the Outmarsh, a land of rich pasture, including some remnants of ridge and furrow divided by narrow dykes with brackish water. Thirdly, the coastline itself is an area subject to continual erosion and accretion and, as a result, is vulnerable to high water and flooding.

Source: Lincolnshire Coast and Marshes Countryside Character Area Description

2.3 Bedrock geology

This NCA is underlain by Cretaceous Chalk, with later Quaternary sand, gravel and clay deposits laid down following glacial action.

Source: Lincolnshire Coast and Marshes Countryside Character Area Description

2.4 Superficial deposits

Glacial tills were deposited across the Middle Marsh. Marine alluvium characterises the Outmarsh, created by higher sea levels following the last ice age. Areas of dune sand and marine shingle at Gibraltar Point and North Somercotes are important for wildlife.

Source: Lincolnshire Coast and Marshes Countryside Character Area Description

2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	1
National	Mixed interest SSSI	2
Local	Local Geological Site	8

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

Glacial tills across the Middle Marsh give rise to slowly permeable, seasonally waterlogged fine loamy soils supporting cereals. The coastal Outmarsh's marine alluvium deposits produce soils of a deep clay and calcareous character – fertile soils for cereals, vegetables and pastures.

Source: Lincolnshire Coast and Marshes Countryside Character Area Description

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

Agricultural Land Classification	Area (ha)	Percentage of NCA
Grade 1	3,702	4
Grade 2	13,864	16
Grade 3	62,486	71
Grade 4	129	<1
Grade 5	0	0
Non-agricultural	3,066	3
Urban	4,567	5

Source: Natural England (2010)

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

3. Key waterbodies and catchments

3.1 Major rivers/canals

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

Name	Length in NCA (km)
Great Eau	21
Louth Canal	19
River Freshnay	8
Wainfleet Haven or Steeping River	8
Steeping River	7

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.

Occasional 'blow wells' occur where sand and gravel lenses allow water from the Chalk to reach the surface. A complex series of rivers and small streams drain slowly east across the plain towards the sea – some relying on numerous man-made drains.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 72,145 ha, forming 82 per cent of the NCA.

Source: Natural England (2010)

3.3 Water Framework Directive

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



The Great Eau river is one of the main waterbodies in the NCA.

4. Trees and woodlands

4.1 Total woodland cover

The NCA contains 2,122 ha of woodland (2 per cent of the total area), of which 493 ha is ancient woodland.

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

4.2 Distribution and size of woodland and trees in the landscape

Woodland is generally limited. Important concentrations of woodland occur on heavy boulder clay spanning the border between the Middle Marsh and the Wolds, mainly old hazel and ash coppice. The largest block is 177 ha but most are less than 20 ha in size. Coniferous plantation is present on areas of dune sand at Gibraltar Point and North Somercotes – including a block of 36 ha. Sparse woodland on the Outmarsh is limited to small patches around settlements, farmsteads and recent planting around caravan sites.

Source: Lincolnshire Coast and Marshes Natural Area Profile

4.3 Woodland types

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

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

Woodland type	Area (ha)	Percentage of NCA
Broadleaved	666	1
Coniferous	153	<1
Mixed	278	<1
Other	164	<1

Source: Forestry Commission (2011)

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

Woodland type	Area (ha)	Percentage of NCA
Ancient semi-natural woodland	320	<1
Ancient re-planted woodland (PAWS)	173	<1

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Occasional hedgerows occur on the Middle Marsh. Drainage ditches bound fields on the Outmarsh.

Source: Lincolnshire Coast and Marshes Countryside Character Area description; Countryside Quality Counts (2003)

5.2 Field patterns

Large scale, rectilinear cereal and vegetable fields are common on the Middle Marsh dating back to 18th and 19th century reorganisation. Ancient, irregular pasture fields are found on the Outmarsh, particularly around settlements. Some areas of ridge and furrow indicate past arable farming.

Source: Lincolnshire Coast and Marshes 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

Cereals are the dominant farm type in this area with 271 holdings. Grazing livestock, mixed and general cropping holdings make up the mixed agricultural character. Trends between 2000 and 2009 show a 43 per cent decrease in the number of dairy farms (from 23 to 13 farms), they also show a 16 per cent increase in the number of 'other' holdings (likely to be smallholdings - up to 116 in 2009).

Source: Agricultural Census, Defra (2010)

6.2 Farm size

189 holdings are over 100 ha in size, accounting for 83 per cent of the land farmed in the NCA (59,915 ha). The second most numerous size of holding is between 5 and 20 ha, with 160 holdings, although this only accounts for 2 per cent of the farmed area.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

2009: Total farm area = 72,272 ha; owned land = 45,601 ha

2000: Total farm area = 69,566 ha; owned land = 46,753 ha

Source: Agricultural Census, Defra (2010)

6.4 Land use

Cereal crops are the dominant land use accounting for more than 51 per cent of the farmed area (36,535 ha) followed by grassland with 20 per cent or 14,127 ha. Since 2000 there has been a 93 per cent increase in the area used to grow oilseed crops (5,481 to 10,549 ha).

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

Pigs (49,100) are the most numerous livestock, followed by cattle (22,900) and then sheep (13,700). The number of pigs fell by 23 per cent between 2000 and 2009, with 15,000 fewer. The number of cattle and sheep also fell during this period.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

The number of principal farmers (owner managers) fell by 10 per cent or 100 between 2000 and 2009, to 879. The numbers of full time and casual workers also fell during the same period by 49 per cent (249 full time workers) and 24 per cent (50 casual workers).

Source: Agricultural Census, Defra (2010)

Please note: (i) Some of the Census data are estimated by Defra so may not present a precise assessment of agriculture within this area (ii) Data refers to commercial holdings only (iii) Data includes land outside of the NCA where it belongs to holdings whose centre point is recorded as being within the NCA.

7. Key habitats and species

7.1 Habitat distribution/coverage

Salt marsh, sand dunes and saline lagoons occur between Cleethorpes and Mablethorpe. Extensive dunes and salt marshes are found at Gibraltar Point. Important calcareous sand dune system with freshwater marsh and maritime fen are found south of Saltfleet Haven. Neutral and wet grassland are present, including important areas at Lindsey Outmarsh. In addition the NCA contains important arable habitats. These support nationally important assemblages of arable birds.

Source: Lincolnshire Coast and Marshes Natural Area Profile

7.2 Priority habitats

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

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

Priority habitat	Area (ha)	Percentage of NCA
Coastal sand dunes	632	1
Reedbeds	349	<1
Coastal and flood plain grazing marsh	172	<1
Fens	29	<1
Lowland calcareous grassland	38	<1
Lowland meadows	39	<1
Purple moor grass and rush pastures	17	<1
Mudflats	14	<1
Saline lagoons	10	<1

Source: Natural England (2011)

Maps showing locations of priority habitats are available at

- <http://magic.defra.gov.uk> select 'Habitats and Species/Habitats'

7.3 Key species and assemblages of species

- Maps showing locations of some key species are available at: <http://magic.defra.gov.uk> select 'Habitats and Species/Habitats'
- Maps showing locations of S41 species are available at: <http://data.nbn.org.uk/>

8. Settlement and development patterns

8.1 Settlement pattern

Dispersed settlement throughout agricultural areas is mainly concentrated at the foot of the scarp. The NCA includes historic market towns including Alford, Burgh-le-Marsh and Louth – reputedly with the tallest parish church spire in England. Windmills at Alford, Burgh-le-Marsh and Waltham break up the skyline on the coastal plain. Extensive urban development at the fishing port of Grimsby and resort centres at Cleethorpes, Mablethorpe and Skegness spread out from their nucleated centres. Docks and oil refinery structures at Immingham dominate the skyline of the coastal plain (in the Humber Estuary NCA).

Source: Lincolnshire Coast and Marshes Countryside Character Area description; Countryside Quality Counts (2003)

8.2 Main settlements

The main settlements within the NCA are; Grimsby 87,574 and Skegness 18,910. The total estimated population for this NCA (derived from ONS 2001 census data) is: 242,169.

Source: Lincolnshire Coast and Marshes Countryside Character Area description; Countryside Quality Counts (2003), Natural England (2012)

8.3 Local vernacular and building materials

Traditional building materials are brick and pantile, resulting from extensive rebuilding in 18th century and later. Some reed thatch survives from the previously common buildings constructed from mud, stud and plaster walls with thatch. Some surviving examples of mud and stud buildings survive particularly in the Outmarsh area. Spilsby sandstone has been used in the construction of the area's churches.

Source: Lincolnshire Coast and Marshes Countryside Character Area description; Countryside Quality Counts (2003)

9. Key historic sites and features

9.1 Origin of historic features

There are a number of medieval and post-medieval features on the marshes for example at Tetney and Somercotes. Earlier activity from the Iron Age and Roman periods is often buried under the silts. The artificial watercourse of Louth Canal with marked embankments, built in the 18th century, is a feature in the landscape. The Saltfleetby Second World War anti-invasion defence works are a rare example where the wartime deployment of gun emplacements and other installations survives within a largely unaltered landscape. The industrial heritage of the Grimsby fishing industry is notable in the north. Parklands and gentry houses are found in the Middle Marsh, including Gunby Hall, Well Vale Hall, Brackenborough and Brocklesby. There are several deserted mediaeval villages and moated sites as well as sites such as Markby Priory and Hagnaby Abbey and the remains of Thornton Abbey.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 4 Registered Parks and Gardens covering 537 ha.
- No Registered Battlefields.
- 60 Scheduled Monuments.
- 957 Listed Buildings.

Source: Natural England (2010)

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

10. Recreation and access

10.1 Public access

- 1.4 per cent of the NCA, 1,274 ha, is classified as being publically accessible.
- There are 693 km of public rights of way at a density of 0.8km per km².
- There are no National Trails within the NCA.

Source: Natural England (2010)

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

Access designation	Area (ha)	Percentage of NCA
National Trust (Accessible all year)	0	0
Common Land	0	0
Country Parks	63	<1
CROW Access Land (Section 4 and 16)	34	<1
CROW Section 15	2	<1
Village Greens	1	<1
Doorstep Greens	1	<1
Forestry Commission Walkers Welcome Grants	3	<1
Local Nature Reserves (LNR)	72	<1
Millennium Greens	1	<1
Accessible National Nature Reserves (NNR)	837	<1
Agri-environment Scheme Access	63	<1
Woods for People	264	<1

Sources: Natural England (2011)

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



Skegness Pier.

11. Experiential qualities

11.1 Tranquillity

Based on the CPRE map of tranquillity (2006) it appears that the lowest scores for tranquillity are associated with the conurbations of Grimsby and Cleethorpes. The highest scores for tranquillity are found in the more rural isolated areas away from the settlements and transport networks.

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

Tranquillity	Score
Highest value within NCA	125
Lowest value within NCA	-78
Mean value within NCA	5

Sources: CPRE (2006)

- More information is available at the following address:
www.cpre.org.uk/resources/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 a similar pattern to the Tranquillity Map, with the main areas of disturbed land around the developed centres of Grimsby, Cleethorpes, Louth, Alford, Mablethorpe and Skegness, as well as along the A16 road corridor. A breakdown of intrusion values for this NCA is detailed in the following table.

Intrusion category	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	14	23	33	19
Undisturbed	82	71	61	-21
Urban	4	4	6	3

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are an increase in the area of disturbed/intruded land of 19 per cent, matched by a decrease in the areas of undisturbed/un-intruded land by 21 per cent.

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



Saltfleetby Theddlethorpe Dunes National Nature Reserve.

12. Data sources

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

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

Supporting document 2: Landscape change

Recent changes and trends

Trees and woodlands

- Woodland as a proportion of the landscape has been increasing and there has been an increase in the area of woodland managed under the Woodland Grant Scheme.
- There are 2,122 ha of woodland covering 2 per cent of the area; 1,544 ha is broadleaved woodland which has increased substantially since 2009.

Boundary features

- Data from March 2011 shows a dramatic increase with 1,480 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. Stewardship Agreements for hedge management, planting and restoration have increased and the estimated boundary length is 3,971 km.
- More hedgerows and hedgerow trees are found inland from the coast which fits in with the landscape character of the area.
- Irregular ditches, streams and dykes are important features in the NCA which are reliant on water level management. Wetland habitats reduce in distribution and size and contain important wetland plant species of increasing scarcity for example wetland plants including priority species such as the ribbon-leaved water-plantain.

Agriculture

- Arable intensification and farm amalgamation has taken place, particularly of smaller farms on the good quality soils of the Outmarsh towards the coast.
- The total farmed area has shown signs of increasing while farm ownership reduced between 2000 and 2009. There has been a loss of medium-sized farm enterprises which have largely been edged out.



Manor Herd of Lincoln Red cattle - a rare breed developed in Lincolnshire.

- Oilseed crops and maize have increased and large-scale cropping patterns have impacted upon the landscape. Field and cropping patterns have also been influenced by the growth of the refrigerated food industry in neighbouring settlements, for example Grimsby.
- Livestock numbers have changed in the area and since 2000 there has been a 43 per cent decrease in the number of dairy farms. Pig farming has also changed and pig numbers have reduced noticeably. Mixed and general cropping has been reduced, as has horticulture.
- The area of grazing and hay meadows has been in decline but since the mid-2000s the Lincolnshire Coastal Grazing Marsh Project has provided advice to farmers and landowners within target areas in East Lindsey around Burgh-le-Marsh, Saltfleetby and Anderby/Huttoft covering some 9,000 ha. This has helped slow the continuing loss of permanent grassland and has resulted in some habitat restoration and creation.
- Artificial defences are being renewed from Immingham to Cleethorpes, recognising the need to protect industry and housing that have developed along the coastline.
- The NCA has seen an increase in holiday homes, caravans and theme parks; although overall rates of development are moderate, the increase is significant particularly along the coastal strip.

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 Grimsby (and Immingham).
- Since 2003, industry and port development has continued to expand with recent applications for extension of port handling and storage, and sites for turbine construction to supply off-shore wind farms. There are an increasing number of proposals for renewable energy schemes, including wind turbines. Development of infrastructure has taken place including a new water pipeline to link Covenham Reservoir to Boston (within The Fens NCA).



Many of the coastal roads are bordered by holiday caravans.

Semi-natural habitat

- Semi-natural habitats are important in the NCA but are limited to the coastal area, with 3 per cent nationally designated for nature conservation. Habitat creation is underway between Sandilands and Chapel Point within the Lincolnshire Coastal Country Park.
- Of the SSSI, 78 per cent are in favourable condition and 22 per cent are in unfavourable, recovering condition.
- Some farmland features have declined including winter stubble, uncropped field margins, ditches and hedgerows. There is a need to incorporate farmland habitats and develop networks of linked habitats to help retain farmland features and enhance habitats for wildlife, particularly farmland birds.
- Many of the field boundaries on lower-lying areas are ditches and narrow dykes, however data from Countryside Quality Counts shows that Environmental Stewardship agreements were for hedge management, planting and restoration.
- The loss of wet grassland pasture is particularly evident. Pasture and older grassland survives principally on the roadside verges and ridge and furrow but also elsewhere in the NCA.

Historic features

- English Heritage's annual 'Heritage at Risk' register indicates heritage assets that stand to be lost through neglect, inappropriate cultivation methods or through dewatering. Ancient earthworks, agricultural buildings such as historic farmhouses and barns, as well as pumping and military structures are typical relicts in this NCA.
- Traces of ridge and furrow can be found. This is under increasing threat from cultivation and a loss of ridge and furrow is evidenced due to cropping, such as on the Outmarsh along the coast.
- Two per cent per cent of the NCA is historic parkland and this is supported by historic parkland grants and agri-environment schemes.



Fine examples of historic buildings in the Lincolnshire Coast and Marshes include Gunby Hall.

Coast and rivers

- There were tidal surges and flood warnings along the east coast in 2013/14. There is a changing, dynamic system of accretion and erosion along the coastline, creating intertidal and subtidal mudflats and salt marsh 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 Gibraltar Point. The reclamation of salt marsh for agriculture and consequential squeezing of intertidal mudflats has had a significant impact on character.
- Abstraction levels from the majority of rivers and water courses in this NCA are above those needed to achieve good status in line with the Water Framework Directive, so there are potential issues with deterioration due to over-abstraction.
- The area of coast lies within Flamborough Head to Gibraltar Point and a shoreline management plan (SMP) which considers the potential risk of flooding and coastal erosion. The SMP recommends the policy option to 'hold the existing line of defence' – maintenance of the existing line of defence with upgrades to counter climate change and sea level rise.
- Coastal protection works have been undertaken, formerly by major engineering and currently by beach nourishment along parts of the coast. To counter erosion, since 1994 the Environment Agency has undertaken a major scheme (Lincshore) along the entire coast between Mablethorpe and Skegness. Along this stretch of coastline, the defences provide flood protection for land which is low-lying for several kilometres inland. This has been carried out at places of greatest erosion, for example, Sutton on Sea, Mablethorpe, Trusthorpe, Boygriff, Wolla Bank/Chapel Six Marshes,

Trunch Lane and Ingoldmells. New flood defences have been created near Grimsby/Cleethorpes.

- The bathing waters along the coastline remain at a good standard with the main resorts of Cleethorpes and Skegness, Mablethorpe and Sutton on Sea holding 'Blue Flag' awards. This is likely to be maintained through partnership work.
- Abstraction levels from the majority of rivers and water courses in this NCA are above those needed to achieve good status in line with the Water Framework Directive, so potentially there are issues with deterioration due to over-abstraction.

Minerals

- The Aggregates Mineral Resources map shows that a small number of active quarries exist.
- Clay has historically been extracted in this NCA but otherwise there is no significant extraction of minerals here. Clay pits formed in response to the 1953 floods can be found; several are now managed as nature reserves conservation projects such as Sea Bank Clay Pit SSSI.
- Aggregate dredging takes place offshore in licensed zones and there are a number of such sites located in the Humber Estuary.
- The Lincshore Scheme, a beach re-nourishment initiative whereby sand is pumped from licensed offshore sites onto 20 km of beach. The Environment Agency project plays a vital role in helping to reduce flood risk to coastal communities.

Drivers of change

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, increasing the flood risk for adjacent land and causing significant alterations to patterns of erosion and deposition, particularly impacting on sand dune habitats.
 - 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 reed bed, 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.
 - Changes in coastal habitats, which may affect feeding opportunities for birds on the mudflats, impacting on the SPAs. Changes in migration patterns as a result of climate change are already impacting on current species assemblages.
 - Increased frequency and duration of heavy rain events, which will increase the risk of river flooding.
 - Increased vulnerability of soils due to their impermeable nature particularly in periods of either drought or flooding, with subsequent implications for farming.
- 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 aquifers and implications for wetland habitats such as reed beds and wetlands linked to the current network of drainage ditches.

Other key drivers

- There is pressure for development and increasing demand for wind farm sites and renewable energy schemes and infrastructure, potential combined heat and power plants, onshore turbines and construction facilities for offshore turbines. Grid connections for large offshore wind farms may affect the area.
- There is a growing role for Grimsby port to provide operations and maintenance support to the offshore renewables sector and this area is receiving significant investment.
- The coastal landscapes are dynamic and constantly changing. These processes need to be monitored to ensure that, for example, Gibraltar Point remains as a naturally-evolving geomorphological feature. The Shoreline Management Plan (SMP) policies will be key drivers for managing future coastal change – there may be opportunities for biodiversity if coastal change occurs. There will always be challenges in managing and responding to coastal change, working with partners and with stakeholders.
- The chalk aquifer underlying the NCA is used extensively for public water supply, industry and agriculture. Protection of water resources is required

as the aquifer is over-abstracted, with 'no water available' in some areas. 82 per cent of the NCA is designated a nitrate vulnerable zone (NVZ) and the chalk aquifer is affected as well as water quality. Opportunities to address water quality issues include; delivering catchment sensitive farming initiatives and encouraging good practice and ensuring adequate maintenance of private sewage treatments.

- A number of settlements, especially towards the coast and particularly during high tides, may be vulnerable to frequent flooding from rivers and the sea and surface water due to the low-lying topography.
- Farmland features have declined including winter stubble, uncropped field margins, ditches and hedgerows. There is a need to incorporate farmland habitats and develop networks of linked habitats to help retain farmland features and enhance habitats for wildlife, particularly farmland birds.
- Green tourism opportunities and The Lincolnshire Coastal Country Park are important to the area.
- Flood risk management assets are constantly assessed by the Environment Agency for value for money and adaptation to climate change. Partnership working with a range of organisations and land managers to manage flood risk effectively, including accessing appropriate funding mechanisms, should be sought.
- There is likely to be an increased need for infrastructure in relation to policies to optimise 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, a more strategic planned approach to accommodating further industrial expansion may open up opportunities for enhancing biodiversity.

- The Marine and Coastal Access Act 2009 provides opportunities to protect the marine environment while ensuring access to all parts of the coast by working in partnership with landowners.
- Grimsby and the coastal resorts of Skegness, Mablethorpe and Cleethorpes are important settlements for recreation and green tourism and further opportunities should be explored.
- Along the coast, existing First and Second World War pill boxes and beach defence emplacements are at risk from coastal erosion and should be recorded.
- Continued expansion of industry and housing in urban areas and along route corridors will increase pressure on land and at night, 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 creating opportunities for biodiversity enhancement through restoration schemes from minerals planning.
- Nationally important gas supplies 138 km off the Lincolnshire coast are transported to the Lincolnshire coast through a network of pipelines which comes ashore at Theddlethorpe Gas Terminal.

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.



Big skies and open views are characteristic of the NCA.

Statement of Environmental Opportunity	Ecosystem Service																		
	Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place / Inspiration	Sense of history	Tranquillity	Recreation	Biodiversity	Geodiversity
SEO 1: Safeguard, manage and enhance the dynamic coastal landscape producing net gains in extent and quality of internationally and nationally important habitats including sand dunes, salt marsh, mudflats, saline lagoons, reedbeds and grazing marsh for the wildlife they support, to increase ecological resilience and to increase the landscape's ability to mitigate flood risk and climate change.	↗*	↑**	↗**	↗***	↗**	↑***	↗***	↗***	↗**	↗**	↗**	↗*	↑**	↗**	↗**	↗*	↑***	↗**	↗*
SEO 2: Conserve and enhance the historic features and settlement character of the dispersed rural villages and market towns of the Middle Marsh and Outmarsh and the fishing heritage of the port of Grimsby. Encourage a strategic approach to land use planning to conserve and enhance the historic landscape and heritage features, encouraging initiatives which contribute towards green tourism, enhance green infrastructure links, manage the pressures of flood risk and climate change, and ensure that infrastructure developments, such as offshore wind turbines do not contribute negatively to the character of the area.	↗***	↗**	↗***	↗***	↔*	↗*	↗***	↗**	↗***	↗*	↗*	↗***	↗**	↗***	↑**	↗*	↑***	↗***	↗**
SEO 3: Ensure sustainable food production while enhancing and strengthening the network of farmland features; manage, expand, create and link habitats within the Outmarsh and Middle Marsh to benefit biodiversity, soil and water quality by promoting farming and forestry practices that are able to adapt to climate change. Manage the rivers, water levels and the provision and quality of water in the whole catchment for human and ecological benefit.	↗*	↗*	↗**	↗**	↗**	↗*	↗*	↗***	↗*	↗*	↗*	↗***	↗**	↗***	↔**	↔**	↗**	↗***	↔*
SEO 4: Conserve and enhance the character of the traditional seaside resorts and the long sandy beaches which help to make the area an important tourist destination; improve opportunities to enhance people's enjoyment of the undeveloped areas along the wild coast with its expansive coast and marsh landscape and its coastal features and wildlife, while protecting high levels of tranquillity and the extensive, open views both inland to the Wolds and also out to sea.	↔**	↗**	↗**	↔**	↔**	↗**	↗***	↗***	↗*	↔***	↗*	↔***	↔*	↗***	↗***	↗*	↑***	↗***	↗**

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

■ National Importance; ■ Regional Importance; ■ Local Importance

Landscape attributes

Landscape attribute	Justification for selection
A dynamic landscape of a mosaic of intertidal areas and terrestrial habitats and a coast of sediments with some designated sites of geological interest and biodiversity.	<ul style="list-style-type: none"> ■ Gibraltar Point is an important and changing area with geomorphological interest and is designated as a Special Protection Area (SPA). ■ The designations of SPA and Special Area for Conservation (SAC) covering the Humber Estuary reach into this NCA – the estuary is also a Ramsar site. ■ A coastline with its narrow sandy beaches and also larger mudflats and intertidal habitats. ■ Rare saline lagoons exist on this coast. ■ Donna Nook National Nature Reserve (NNR) and Saltfleetby-Theddlethorpe NNR are both located in the area.
Medium-scale arable farming and some livestock production with fields bounded by drainage ditches and some hedgerows on higher ground and pasture land.	<ul style="list-style-type: none"> ■ Past management has responded to the underlying soil and drainage conditions, resulting in subtle variations in landscape character. ■ This is a predominantly open, medium-scale agricultural landscape. Mixed arable farmland is predominant in the Middle Marsh to the west of the area, where glacial tills give rise to slow permeable, seasonally-waterlogged fine, loamy soils supporting cereals. Smaller farm units with traditional drained pastures and some vegetable crops are common in the Outmarsh. ■ Pastoral land use close to settlement centres and often associated with ancient enclosures, such as in the Lincolnshire Coastal Grazing Marshes Project⁸ (Conservation Action Plan). ■ The network of ditches makes a significant contribution to the landscape character, as well as providing important wetland habitats for potential improved connectivity. ■ Arable farmland supports a number of birds whose numbers have been on the decline.
Strong sense of undeveloped and sparsely settled rural areas with villages and the inland historic market towns such as Louth. An area featuring greater development on the coastal strip with larger settlements of Grimsby, Cleethorpes and Skegness.	<ul style="list-style-type: none"> ■ The settlements are dispersed and linear and local vernacular is generally characterised by red brick and pantile. ■ Modern infill development on the coastal strip. ■ Coastal character in many prominent resorts of Cleethorpes, Mablethorpe and Skegness, edged by large-scale caravan parks. ■ The popular medieval market town of Louth has historic character. ■ Expansion of road, retail and housing development outside larger settlements of Grimsby. ■ Theddlethorpe Gas Terminal and pipelines extending offshore may impede coastal processes and impact on views. ■ Offshore wind farms visible from the coast. ■ Onshore wind farms/wind turbines along the coastal strip.

⁸ Lincolnshire Coastal Grazing Marshes Project (Conservation Action Plan)

Landscape attribute	Justification for selection
<p>An open landscape - predominantly flat towards the North Sea. Steeper slopes to the west in the Lincolnshire Wolds. Open rural views over the area from the Wolds with sea views along the eastern side.</p>	<ul style="list-style-type: none"> ■ Distant views inland and out to the east coast. ■ An open landscape with open skies – particularly along the coast. ■ There is generally sparse tree and cover which increases to the west in the Wolds Foothills where the landscape includes numerous hills and dry valleys and sinuous narrow woodland. ■ The Lincolnshire Wolds dominate and overlook the NCA. ■ Churches are prominent in the open landscape and a few are distinctive.
<p>The area has a wealth of ancient routes and settlements.</p>	<ul style="list-style-type: none"> ■ Use of the area began with seasonal grazing, salt making and transportation. The linear character of settlement reflects the early medieval driveways used as routes to move livestock. ■ A number of settlements are mentioned in Domesday Book. There are extensive surviving settlement earthworks surrounding shrunken settlements. ■ Scheduled Ancient Monuments exist. ■ A number of priories and historic remains of ecclesiastical structures exist. ■ There is good survival of ridge and furrow earthworks which generally respect the alignment of old enclosure. Surviving planned enclosure indicates planned marshland reclamation in the 18th–19th centuries. ■ Many fields have been consolidated since the Second World War.
<p>The network of public rights of way is limited and there is very little open access land so that access for recreation from urban areas to the countryside and coast is poor. Access to the coast by road provides hot spots for recreation.</p>	<ul style="list-style-type: none"> ■ Early medieval droeways used as routes to move livestock now form many of the modern routes and these often have grass verges. ■ Although there is a relatively limited network of footpaths, those routes that do exist provide some good views and experiences of remote and rural countryside. ■ The NNRs and country parks provide some good quality public access, education and enjoyment. Coastal access is limited in places. ■ There are promoted routes, green infrastructure strategies and development of coastal access and new links to existing rights of way. ■ The public access around the Fish Docks in Grimsby is poor while the People’s Park in Grimsby is a registered park. ■ High levels of multiple deprivation on parts of the coast, with associated health issues in the community, such as in the Grimsby area. ■ Rural lanes in the NCA are quiet routes, popular for cycling and walking. ■ Horse riding is popular in the NCA and on the open beaches, as appropriate.

Landscape attribute	Justification for selection
<p>Sparse woodland is restricted mainly to a number of woodlands, particularly on estates and high ground and linked to ancient forests. Small pockets of deciduous woodland and shelter belts.</p>	<ul style="list-style-type: none"> ■ Copses and woodland spread throughout the farmland of the AONB in the Lincolnshire Wolds –Brocklesby/Claythorpe. ■ Ancient woodland forms a relatively high proportion of the woodland cover. ■ Sparse woodland cover has been typical of the general area but wooded character is enhancing.
<p>Widespread evidence of reclamation and drainage history with extensive network of ditches, dykes, canals and rivers with flood banks and pumping stations. Chalk streams drain into the NCA and watercourses.</p>	<ul style="list-style-type: none"> ■ The watercourses play a key role in draining the low-lying surrounding farmland. ■ Watercourses such as the River Lud feed into the Louth Canal. ■ Covenham Reservoir provides an important supply of domestic water and also recreation/visual amenity. ■ Clay pits, such as along the coast at Wolla Bank, form a series of manmade open water features with associated marginal habitats valuable for wildlife as well as recreation opportunities. ■ Several water features such as chalk streams are designated SSSI and support important species. ‘Blow wells’ are also found associated with the Chalk, for example Tetney Blow Well.
<p>A rich historic rural time depth including a maritime past, traditional coastal seaside towns and grazing marshes contribute strongly to sense of place providing associated recreation and tourism opportunities.</p>	<ul style="list-style-type: none"> ■ Many settlements were established during the medieval period and traces of ancient enclosure can be found. Traditionally, there was seasonal salt production and marsh grazing occurred on reclaimed marsh revealing the connection of farmed land and its reclamation. ■ Sites of medieval interest include several deserted medieval villages. ■ Fishing heritage associated with the area, for example Grimsby Docks. ■ Market town of Louth located at the edge of the Lincolnshire Wolds with its historic environment and access opportunities to the AONB. Burgh-le-Marsh and Alford retain a distinctive historic settlement core with traditional windmills and occasional traditional thatched buildings showing their importance as market towns. ■ Various country house properties are found including Gunby Hall with its well- preserved parkland and important visitor attraction. ■ Coastline with visible evidence of military sea defences dating from the Second World War. ■ Popular seaside resorts and caravan parks include Cleethorpes, Humberston, Mablethorpe, Ingoldmells and Skegness. ■ Developments including offshore wind farms impact on sea views and may affect coastal processes. There is significant opportunity for renewable energy such as wind, tidal and biomass. ■ Visitors are attracted to the area’s nature reserves and the sea life such as the seal population at Donna Nook and Gibraltar Point. ■ Dog walking is very popular – especially on the promenades and shore. ■ Seaside art and events, for example Anderby Creek.
<p>The habitats of the area and its nature reserves support birds and mammals, which also depend on adjacent areas.</p>	<ul style="list-style-type: none"> ■ Seabirds from adjoining NCAs with SPA designations (for example The Wash and The Humber) forage in the area, particularly on the sediments. ■ Mammals including the grey seal breed within the NCA. The common seal breeds here and in adjacent NCAs (and in The Wash).

Landscape opportunities

- Retain the open character of the landscape with its expansive views and big skies. Protect areas with a strong sense of remoteness, wildness and tranquillity and dark skies at night, for example NNRs and AONB.
- Protect the nationally and internationally significant coastal habitats in the area including the areas of salt marsh, mudflats, sand dunes and arable pasture land which support large numbers of protected species and provide opportunities for people to enjoy access to nature.
- Conserve, manage and expand semi-natural habitats that reveal the influence of underlying soils and hydrological conditions.
- Protect the flat, open, low-lying Outmarsh for its remote and tranquil character which is enjoyed by walkers, its archaeological assets which provide a link to the past, and its drained pasture fields which support bird species such as the golden plover and pink-footed goose.
- Manage the water table levels so that existing wetland habitats are retained. Manage and expand the wetland habitats, including wet pasture, fens, reedbeds and where appropriate wet woodland.
- Ensure that managed realignment sites and new flood storage areas are managed to create wetland habitats that contribute to landscape character and biodiversity, ideally with some public access.
- Protect the areas of existing woodland, hedgerows and hedgerow trees in the Middle Marsh which are characteristic of the landscape contrast between inland and coastal marshlands.
- Plan for new woodland planting at appropriate locations, especially where this would be beneficial to creating new green infrastructure routes or integrating new development into the landscape.
- Plan to allow for the predicted impact of climate change, including sea level rise, coastal erosion and flooding, by using appropriate mitigation and adaptation principles.
- Plan to allow natural coastal processes to continue in appropriate areas along the coastline to allow essential sediment transportation, to create other intertidal habitats and natural sea defence and to enhance the landscape character of the coast.
- Conserve the productive soils for continued agricultural production while ensuring that the agricultural landscapes make a greater contribution to wildlife, especially to farmland birds, by avoiding or reducing cultivation on the steepest slopes (in the Lincolnshire Wolds foothills) and where there are archaeological features.
- Plan opportunities to provide links between the larger settlements to the surrounding countryside so that people can enjoy the tranquillity of rural areas, its history and the coast and include the development of more green spaces in towns such as Grimsby.

- Plan to extend coastal access where feasible by working in partnership. Manage access, recreation and tourism facilities through the character area and where appropriate, support the creation of new facilities to increase people's enjoyment of the landscape. Seek opportunities to interpret the particular landscape character and history and provide opportunities for more people to understand the area and enjoy the landscape, biodiversity, geodiversity and archaeological assets.
- Conserve quiet rural areas by encouraging sensitive development, respecting the long, open views and the strong rural character and local vernacular of the area. New development in urban areas should be in keeping with existing character and should be well-designed and sited to reduce visual intrusion. Adopt the area's traditional and historic architecture and its distinct patterns of settlement to plan for and inspire new development. Use appropriate local building materials and vernacular styles in restoring buildings and structures.
- Manage, enhance and restore the network of watercourses by working with land managers to improve biodiversity and water quality. Reduce flood risk while enhancing these landscape features by creating or maintaining marginal habitats around watercourses and creating buffer strips of wet grassland.
- Manage, enhance and restore declining farmland features such as grasslands, networks of ditches, small copses and hedgerows. Provide roosting and feeding areas for farmland birds including the barn owl, corn bunting and tree sparrow.

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



Waltham windmill.

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.

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision	<p>Productive agricultural land</p> <p>Soils</p> <p>Livestock</p> <p>Fishing</p>	<p>Food production is key to the NCA. The area is dominated by rich, loamy, clayey soils which support intensive arable cultivation such as wheat, oilseeds, and root crops -with the remainder put down to grass or uncropped.</p> <p>In the Middle Marsh an expansion of arable coupled with intensification has occurred with a decline in mixed and general cropping.</p> <p>The agricultural areas of the Outmarsh adjacent to the coast have smaller field sizes and a more ancient drained landscape exists. There is also a higher proportion of grass and rough grazing. A number of small beef and dairy herds are supported by the area's pastures and grazing marshes.</p> <p>Some crops from the area are used in the frozen food industry at Grimsby where the fishing industry has declined. A fishing port remains at Grimsby and there is fishing and trawling along the Lincolnshire coast.</p>	Regional	<p>Food provision is an important service.</p> <p>Although there is scope for increasing food provision there are issues around water resource, the long term viability of soils, the loss of soil quality and the issue of flooding.</p> <p>The grazing marshes, for example Lincoln Red cattle, one of the oldest of the UK's native beef cattle breeds.</p> <p>The marshes along with other areas of rough grassland on the seaward side of the defences are used for grazing by local cattle farmers with beef cattle grazing on the salt marsh.</p> <p>This area of the southern North Sea forms an important focus for fishing activity which needs to be sustainable.</p>	<p>Work with land managers and the farming community to continue to support the production of food.</p> <p>Develop stronger branding of locally produced food, such as rare breed Lincoln Red cattle thus maintaining and strengthening farming and its associated cultural landscapes and the wildlife it supports.</p> <p>Seek opportunities to promote links between the landscape and soil management practices and high quality foods through initiatives to enhance marketability of products through high environmental standards. Ensure that soils are managed to enable continued agricultural production.</p> <p>Address demand for water through providing more on-farm water storage.</p> <p>Seek opportunities to promote sustainable fishing and raise awareness about links between the coast and the marine areas.</p>	<p>Food provision</p> <p>Water availability</p> <p>Regulating water flow</p> <p>Biodiversity</p> <p>Sense of place/ inspiration</p> <p>Sense of history</p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	Woodland	<p>A very limited supply of timber exists. With a woodland cover of only 2 per cent (2,122 ha) this NCA offers very little in the way of commercial timber production.</p> <p>An important concentration of woodland occurs on heavy glacial tills overlapping with the AONB and the Lincolnshire Wolds NCA.</p> <p>Wooded open farmland is present around Brocklesby and Claythorpe. Some scattered woodland blocks occur and span the border between the Middle Marsh and the Wolds. These mainly consist of old hazel and ash coppices and are important for their biodiversity, some being ancient woodland.</p>	Local	<p>There are fewer large blocks of woodland in the area.</p> <p>Woodland on the Outmarsh is restricted - except around farmsteads and settlement edges.</p> <p>There is a need to maintain existing ancient woodland for its biodiversity.</p> <p>New woodland planting should occur without restricting any long and open views. There may be potential for woodland planting to reduce flood flows downstream.</p> <p>Extensive woodland planting should be restricted to areas with existing woodland cover towards the Lincolnshire Wolds to enhance landscape character.</p>	<p>Only seek opportunities to create new woodland in appropriate locations such as extending existing woodland areas towards the Lincolnshire Wolds.</p> <p>Actively manage ancient woodland to enable natural regeneration.</p> <p>Seek opportunities to bring existing woodland into management.</p> <p>In the Middle Marsh explore opportunities to plant linear woodlands alongside watercourses and in flood plains to slow flood flows and ensure the new plantations will not affect areas which are prized for their long and open views.</p> <p>Plant mainly individual trees in the Outmarsh.</p>	<p>Timber provision</p> <p>Climate regulation</p> <p>Regulating soil erosion</p> <p>Regulating water quality</p> <p>Regulating water flow</p> <p>Biodiversity</p> <p>Sense of place/ inspiration</p> <p>Sense of history</p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability	<p>Chalk aquifer</p> <p>Network of watercourses including Great Eau, River Freshen, Waithe Beck and Louth Canal</p> <p>Semi-natural habitats</p> <p>Reservoir</p>	<p>A major chalk aquifer underlies this NCA supplying water to the Humber and East Midlands for industry, agriculture and drinking water.</p> <p>Covenham Reservoir primarily serves the water needs of Grimsby and Cleethorpes. It is a supply feed for Louth/Mablethorpe/Skegness and the reservoir can be supplemented by water from the Great Eau and Long Eau. A new water pipeline from the Covenham Reservoir will serve Boston (within the Fens NCA).</p> <p>In the Grimsby area and the Humber Estuary NCA, no consumptive abstractions are granted in order to prevent saline intrusion.</p> <p>Groundwater levels are considered to be over-licensed, with no surplus available for additional supply. For example, Laceby/ Kirky Beck have 'no water available' for additional abstraction.</p> <p>Currently the farmed environment covering much of the NCA is lacking in a network of semi-natural habitats and these are fragmented.</p>	Regional	<p>The majority of the chalk aquifer (which also underlies the adjoining Lincolnshire Wolds NCA) is classified as 'no water available', with part of the north-eastern area of the Chalk being over-licensed.</p> <p>Water storage capacity on farms should be increased to enable farms to reduce water abstraction.</p> <p>There is a risk of growing salinity within groundwater, especially close to the coast, due to over-abstraction.</p> <p>The Great Eau headwaters are spring-fed from the chalk aquifer and sedimentation of the streams/river affects spawning areas of freshwater fish.</p> <p>Soils in the area could be improved to reduce rapid runoff with scope to increase semi-natural habitats throughout the farmed environment as these aid infiltration and slow down runoff.</p>	<p>Employ sympathetic land management to improve the sustainable use of water.</p> <p>Work with agricultural businesses along the coastal fringe to ensure sustainable rates of groundwater extraction and to lessen the risk of saline intrusion and safeguarding agricultural land use in the future.</p> <p>Adopt land management practices that improve soil infiltration.</p> <p>Rainwater harvesting opportunities should be explored. Encourage the expansion of water storage capacity on farms to enable farms to reduce the volumes of water abstraction from surface and groundwater sources.</p> <p>Restore and increase areas of semi-natural habitats to increase infiltration, such as arable field margins.</p> <p>Retain and expand grassland/wet grassland in the coastal marshes.</p> <p>Recreate low input flood plain grazing marsh grassland benefiting landscape, habitat and aquifer re-charge, water quality, soil erosion as well as limiting flood risk.</p>	<p>Water availability</p> <p>Food provision</p> <p>Regulating water flow</p> <p>Regulating water quality</p> <p>Regulating soil quality</p> <p>Biodiversity</p> <p>Climate regulation</p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Genetic diversity	Lincoln Red cattle Lincoln Longwool sheep	<p>The original stock of Lincoln Red Cattle is a rare breed according to the Rare Breed Survival Trust (RBST).</p> <p>Cattle are an important aspect of agriculture particularly in the wetter, low-lying areas adjacent to the coast. There are also (more commonly) non-rare breeds of Lincoln crosses which make up some of the beef cattle numbers in the NCA.</p> <p>Various sheep breeds were developed in the area including the Lincoln Longwool – today a breed prized for their lustrous long wool.</p>	Local	<p>Sources of genetic material for use in breeding improved types of plants and animals for agricultural purposes. Sources can arise from existing traditional varieties or breeds.</p> <p>Lincoln Red cattle which were developed in this area using indigenous draught- cattle of the region.</p> <p>Lincolnshire sheep breeds, for example Lincoln Longwools, were once important in the area -and traded in, for example Burgh le Marsh sheep market.</p>	<p>Explore opportunities and encourage partnership of farmers, land managers and organisations that are committed to promoting the benefits of genetic diversity.</p> <p>Seek opportunities to recreate low input grazing marsh – providing sites for traditional rare breeds for viable stock farming and help to protect rich historic environments such as ancient ridge and furrow.</p> <p>Explore and maximise the use of best practice Lincolnshire Grazing Marshes Project and the Grazing Animals Project partnership (part of the RBST).</p>	<p>Genetic diversity</p> <p>Biodiversity</p> <p>Sense of place/ inspiration</p> <p>Sense of history</p> <p>Food provision</p>
Biomass provision	Existing woodland	<p>There is limited scope for biomass production from existing woodland as coverage is sparse –only 2 per cent.</p> <p>The area offers medium potential yields for short rotation coppice (SRC) and high potential yields for miscanthus throughout the area according to Defra’s biomass potential map.</p>	Local	<p>A limited woodland cover offers little potential for providing wood fuel. There is a small supply of locally-sourced wood from existing woodland.</p> <p>Extensive biomass crops are unlikely as much of the land is used for productive arable cropping.</p> <p>The Outmarsh has smaller fields and less regular field pattern, with boundaries either as dykes or not present.</p> <p>On the Middle Marsh – with its rectilinear fields and occasional hedgerows biomass planting could be accommodated.</p> <p>There are some limited opportunities for planting biomass crops in association with new developments but this would introduce unwelcome change to the very open, flat landscape of the Outmarsh.</p> <p>Biomass crops would need to be appropriately located to avoid impacting on feeding or breeding areas for waders, blocking key views or reducing the expansive character of the landscape.</p> <p>Avoid planting SRC and miscanthus close to NNRs.</p>	<p>There are opportunities for using woodland resources sensitively by thinning or coppicing providing woodland owners with a diversified income stream.</p> <p>Biomass planting could be carried out in places on the Middle Marsh. In the Outmarsh avoid planting within 5km of the NNRs, or on ridge and furrow and where this could lead to further loss of grazing marshes.</p> <p>Explore opportunities to use energy crops to screen development around small settlements.</p> <p>SRC and miscanthus should be carefully sited around existing woodland and should be monitored for intrusive development in coastal locations.</p>	<p>Biomass provision</p> <p>Climate regulation</p> <p>Regulating water flow</p> <p>Regulating water quality</p> <p>Regulating soil quality</p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation	Soils Grazing marsh Mudflats /salt marsh Woodland	<p>Significant carbon storage will be provided by the grazing marsh, reedbeds, mud flats and marine sediments, all of which store high levels of organic matter.</p> <p>Some of the soils of the coastal flats may have more organic-rich soils that will be important to conserve. Away from the coast the soils in this NCA generally have a low carbon content reflecting the dominance of mineral soils.</p> <p>The woodland cover is relatively low at only 2 per cent of the NCA. The larger blocks to the north are managed while smaller more fragmented woodland is more often un-managed.</p> <p>Tidal flooding, exacerbated by rising sea levels, combined with high river flows and rainfall, represents a high flood risk.</p> <p>Continuing coastal squeeze will be likely which will require managed realignment of flood defences to enable intertidal habitats to shift and expand.</p>	Regional	<p>There is some variation along the coast – with more organic-rich topsoils including the soil of the salt marshes where the marine sediments can have elevated organic matter levels. Some of these may be lost through sea level rise.</p> <p>Salt marsh and mudflats have an important role in climate regulation due to carbon lock-in and they have important roles in coastal defence due to, for example, their absorption of wave energy. Their retention and expansion represents a cost-effective flood defence strategy, as well as providing habitat. Managed realignment may also subsequently affect adjacent fresh and brackish water habitats.</p> <p>The main soil types of this NCA are mineral soils with low carbon content.</p> <p>The addition of organic matter can enhance soil structure and may also increase carbon storage. The mineral soils may have potential for carbon sequestration by increasing organic matter inputs and by reducing the frequency/area of cultivation/shallow ploughing.</p>	<p>Adopt cultivation practices that retain and increase the organic content of soils, such as overwintering stubble, and include fallow in rotations. Where possible increase the area of grassland.</p> <p>Conserve, expand and increase carbon storage areas of grazing marsh, reedbeds, salt marsh and mudflats.</p> <p>Seek opportunities to move flood defences back to provide space for the development of new intertidal habitats.</p> <p>Ensure that realignment sites are managed to develop their full potential to support and enhance the biodiversity, interest and characteristic landscape of the coast.</p> <p>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.</p> <p>Seek opportunities to plant broadleaved woodland where this fits with existing landscape character, for example around the wooded areas of Brocklesby.</p> <p>Working in partnership with the South Humber Bank Ecology Group to secure areas of strategic habitat mitigation.</p>	<p>Climate regulation</p> <p>Regulating soil quality</p> <p>Regulating soil erosion</p> <p>Regulating water flow</p> <p>Biodiversity</p> <p>Sense of place/ inspiration</p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	<p>Permanent grassland</p> <p>Semi-natural habitats</p> <p>Reedbeds and other wetlands</p>	<p>The area is drained by a network of rivers, many modified as part of land drainage schemes within the Lincolnshire Coast and Rivers Priority Catchment.</p> <p>82 per cent of the NCA is within a Nitrate Vulnerable Zone.</p> <p>The Water Framework Directive (WFD) Nitrates -pressure is 70 per cent while the WFD phosphates failure is at 20 per cent.</p> <p>Excess nitrates, phosphates and pesticides from sewage and, to a lesser extent, from agriculture, have led to pollution and eutrophication in watercourses while sedimentation in rivers is a priority issue within many catchments.</p> <p>The Anglian River Basin Management Plan indicates that the ecological status of rivers and waterways in the NCA are either 'good' or 'moderate'.</p> <p>Excess chemicals from arable and horticultural food production are identified as issues in intensively managed areas on the Grade 1 and 2 soils.</p> <p>2012 Water Framework Directive (WFD) interim classification data shows that the Steeping is currently at overall 'moderate' ecological potential.</p> <p>The Great Eau is also at overall 'moderate' ecological potential; the Long Eau is classed at 'poor'.</p> <p>The Lud/Louth Canal is at 'good' potential, although some of the tributaries are 'moderate'.</p> <p>The Laceby Beck/Freshney catchment is 'poor' ecological potential.</p> <p>Throughout the rest of the area there are two water bodies currently at bad ecological potential, the Barrow Beck (upper end) and the Buck Beck, and two at 'poor' status.</p> <p>The Seven Towns North and South Eau, Trusthorpe Pump Drain, Anderby Main Drain, Boygrift Drain, Ingoldmells Drain and Cow Bank Drain are classed as 'good' potential, with the remaining WFD water bodies classed as 'moderate'.</p>	Regional	<p>Reasons for the water bodies in the area failing to meet the target of Good include diffuse pollution from both urban and rural areas, point source effluent discharges and lack of habitat and diversity associated with the heavily modified nature of many of the channels.</p> <p>Within the Lincolnshire Coast and Rivers Catchment there is a targeted area for Catchment Sensitive Farming in North Lincolnshire.</p> <p>Excess nitrates and phosphates are particularly an issue in the north of the NCA and in the coastal settlements.</p> <p>There is a risk of nitrates entering the groundwater land across the catchment. The application of fertilisers and manures spread for agricultural benefit can increase nutrient levels in the groundwater.</p> <p>There is a Drinking Water Protected Area within the Grimsby Louth Chalk Ground Water Body.</p> <p>There is a risk of growing salinity within groundwater, especially close to the coast, due to over-abstraction.</p> <p>Excess nitrates, phosphates and pesticides have led to pollution and eutrophication in water courses. In addition, sedimentation of water courses including chalk streams is identified as an issue in streams such as the Laceby Beck/Waithe Beck. Management that reduces soil compaction and run-off will help to reduce water pollution.</p> <p>The ecological quality of most of the surface water is 'moderate', with some watercourses, such as the Great Eau, classified as 'poor'.</p>	<p>Manage farmland in accordance with the principles established by the England Catchment Sensitive Farming Delivery Initiative.</p> <p>Encourage the establishment of areas of semi-natural habitat such as reedbed and washland, which slow the passage of water through the hydrological system and help purify the water.</p> <p>Habitats including reedbeds, fens and wet grassland will help to enhance water quality.</p> <p>New areas of permanent grassland could be established in areas where current practices generate high risk and where soil erosion and diffuse pollution occur.</p> <p>Work in partnership with the Environment Agency to look at ways of reducing leakage of nitrates into the catchment.</p> <p>Work in partnership with the farming community to share best practice:</p> <p>Encourage good soil management, optimum nutrient management, and rainwater harvesting.</p> <p>Reduce fertiliser inputs while also reducing current expenditure of farm businesses.</p>	<p>Climate regulation</p> <p>Regulating soil erosion</p> <p>Regulating soil quality</p> <p>Regulating water quality</p> <p>Biodiversity</p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	<p>River Steeping, Great Eau, Long Eau and the River Led/Louth Canal and Freshney</p> <p>Semi-natural habitats</p> <p>Extensively-grazed permanent grasslands/washlands</p> <p>Deep clay soils</p>	<p>Flood control is a key issue for much of the NCA and a major flooding event occurred in 1953. Increased storm frequency is leading to higher flood flows coming downstream.</p> <p>The topography of the area is generally low-lying with many coastal areas only a few metres above sea level and flooding a potential issue.</p> <p>The Environment Agency (EA) Flood Risk Map indicates a high risk of river and/or coastal flooding, especially the areas close to the North Sea (but also at Louth near the Lincolnshire Wolds). During periods of high spring tides, flooding may extend up the river floodplains.</p> <p>Coastal flooding (to a width of up to 10 km around villages, for example North Somercotes). Coastal settlements of Grimsby, Mablethorpe, Chapel St Leonards and Skegness are affected.</p> <p>The area is drained by a dense network of rivers, most of them modified as part of land drainage schemes. Flood risk is currently managed in coastal locations through the maintenance of watercourses, raised embankments and pumping stations. (Inland Drainage Boards).</p>	Local	<p>The area adjacent to the coast is low-lying and increases in the intensity of precipitation events associated with climate change may lead to an increase in flooding.</p> <p>Coastal grazing marshes provide increased lag time in water flow and assist in water storage, while also providing agricultural land use and wildlife habitats particularly for waders and farmland birds.</p> <p>Storage of flood waters has been an effective mechanism along main rivers to benefit both biodiversity and to provide flood alleviation such as at Saltfleet where outflows are dependent on tidal cycles.</p> <p>Drought resilience is also beneficial and increasing the distribution of semi-natural habitats can assist, for example reedbeds, other wetland areas, grasslands and small woodlands.</p> <p>Along the flood plain upstream of Louth and Saleby may reduce the risk of downstream flooding in Louth and Mablethorpe respectively.</p> <p>Most measures to address river flood issues, for example encouraging extension of flood storage areas, slowing the flow of watercourses through restoring natural routes and planting, would be more effective when applied to rivers and streams upstream, especially in the Lincolnshire Wolds NCA.</p> <p>The current flood storage capacity in the NCA needs to be maintained and increased, particularly where there is the likelihood of high tide and high run-off/river flow combinations. A flood risk management strategy exists to assess flood risk variant across the area and is the best approach to managing this risk in the future.</p> <p>Most settlements are offered some protection from flooding by man-made defences on the coast and main rivers.</p> <p>Historically the area has been heavily managed to reduce the probability of flooding. Flood risk is expected to increase in the future. Short-term, existing flood defences can be maintained at existing levels – this is current policy. Future flooding is expected to become more intense, so protection given by these defences may decline.</p>	<p>Manage the network of ditches and drains to ensure that while 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.</p> <p>Increase the current flood storage capacity by creating sizeable areas of lowland fen, reedbeds and flood plain grazing marsh.</p> <p>Flood storage along the main rivers through provision of flood fields and reinstatement through Higher Level Stewardship and local initiatives.</p> <p>Implement the recommendations from the EA Anglian Habitat Restoration Programme.</p> <p>Develop a sustainable, integrated and long-term flood risk management approach.</p> <p>Combine objectives for rewetting areas/ flood plains for biodiversity and for flood risk management. This aims to store winter floodwater.</p> <p>Recreate flood storage areas in partnership and with guidance from the Environment Agency. These may benefit both wildlife and flood alleviation at the coast (for example Saltfleet) where outflows are dependent on tidal cycles.</p>	<p>Regulating water flow</p> <p>Biodiversity</p> <p>Regulating coastal erosion and flooding</p> <p>Biodiversity</p> <p>Regulating water quality</p> <p>Regulating soil erosion</p> <p>Food production</p> <p>Recreation</p> <p>Sense of history</p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil quality	<p>Fertile soils</p> <p>Slowly permeable and seasonally wet soils</p> <p>Naturally high groundwater</p> <p>Grassland and other semi-natural habitats</p>	<p>The majority of soils are Grade 3 (71 per cent). Grade 2 covers 16 per cent and Grade 1, 4 per cent.</p> <p>There are seven main soils. Four of these are:</p> <ul style="list-style-type: none"> ■ Slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils, covering 45 per cent of the NCA. ■ Loamy and clayey soils of coastal flats with naturally high groundwater (39 per cent per cent). ■ Slightly acid, loamy and clayey soils with impeded drainage (5 per cent per cent). ■ Saltmarsh soils (2 per cent). 	National	<p>The slowly permeable, seasonally wet 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 that increase organic matter levels can help reduce these problems.</p> <p>The loamy and clayey soils of coastal flats have a high agricultural potential; dependent on the continued ability to pump, drain and protect the soils from sea flooding/saline intrusion. Some soils at risk of structural damage where drained. The soils are increasingly under threat of loss from sea level rise although they will help protect other inland soils from these issues. Where there is a high silt/fine sand content compaction or capping may be an issue.</p> <p>The soils have naturally high groundwater and high agricultural potential but this is dependent on the continued ability to pump, drain and protect the soil from sea flooding /saline intrusion.</p> <p>Where there is high silt/fine sand content and/or poor drainage, capping may occur, which can be reduced by increasing the organic matter content.</p> <p>In seasonally wet conditions, compaction of the clayey soils may occur, particularly with the use of heavy machinery.</p>	<p>Encourage the adoption of the Defra Code for Good Agricultural Practice (2009)⁹ and Environment Agency's 'Think Soils' manual (2008)¹⁰ to maintain good soil structure.</p> <p>Adopt cultivation practices that increase organic content of soils, such as introducing fallow into rotations, over-winter stubbles, direct drill and grass leys.</p> <p>Increase storage of water on farm to prevent saline intrusion and damage to soils.</p> <p>In slowly permeable, seasonally wet but base-rich loamy and clayey soils of coastal flats with the potential for compaction /capping will be improved through increasing soil organic matter.</p>	<p>Regulating soil quality</p> <p>Food provision</p> <p>Regulating soil erosion</p> <p>Climate regulation</p> <p>Regulating water flow</p> <p>Regulating water quality</p> <p>Geodiversity</p> <p>Biodiversity</p>

⁹ Defra Code for Good Agricultural Practice (2009)

¹⁰ Think Soils,, Environment Agency (2008); URL: <https://publications.environment-agency.gov.uk/skeleton/publications/ViewPublication.aspx?id=222ae15f-1725-44d3-83f7-3a1113983987>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	<p>Fertile soils</p> <p>Semi-natural habitats</p> <p>Extensively-grazed permanent grassland</p> <p>Soils with high organic matter</p> <p>Trees and woodland</p>	<p>The main soil types covering the majority of this NCA are at low risk of soil erosion. Around 7 per cent per cent of the soils are prone to soil erosion.</p> <p>The soils of the salt marshes will help protect inland soils from loss through coastal erosion and sea level rise. Nevertheless, the smaller areas of lighter soils have an enhanced risk of soil erosion such as on moderately or steeply sloping land where cultivated or where bare soil is exposed.</p> <p>There is also the potential for wind erosion on some coarse-textured or sandy, cultivated variants.</p>	Regional	<p>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.</p> <p>However, the slightly acid loamy and clayey soils with impeded drainage are prone to capping/ slaking, and are at risk of compaction if accessed when wet, thus increasing the risk of soil erosion by run-off.</p> <p>The freely-draining lime-rich loamy soils are also potentially at risk of erosion when cultivated/ bare soil is exposed.</p> <p>In the Lincolnshire Coast Rivers Priority Catchment, sedimentation and siltation of water courses is an identified problem and Catchment Sensitive Farming is promoted.</p> <p>Inter-tidal habitats—the salt marsh and mudflats - play an important role in protecting inland soils from loss through coastal erosion and these need to be protected.</p> <p>These soils need to be protected from sea flooding/saline intrusion. There is a need to pump, drain and protect the soils. Locally, some soils are saline and at risk of structural damage where drained, affecting productivity.</p>	<p>Encourage landowners and managers to use farming methods that protect the soil, such as maintaining vegetative cover.</p> <p>Use of grass buffer strips can reduce soil erosion from susceptible arable fields in the autumn and winter.</p> <p>Encourage the adoption by farmers and landowners of the Environment Agency's 'Think Soils' manual (2008).</p> <p>Follow best practice of Catchment Sensitive Farming. Create grass buffers along ditches and watercourses to capture sediment run-off and plant where it is appropriate.</p> <p>Ensure the protection/ retention of salt marsh to provide cost-effective defence against soil erosion.</p> <p>Protect salt marsh and other habitats to create a buffer between the sea and agricultural land. Manage the abstraction of groundwater to prevent saline intrusion.</p>	<p>Regulating soil erosion</p> <p>Regulating water quality.</p> <p>Regulating soil quality</p> <p>Food provision</p> <p>Climate regulation</p> <p>Regulating water flow</p> <p>Regulating water quality</p> <p>Biodiversity</p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pollination	Semi-natural habitats including salt marsh	<p>1 per cent of the area is coastal sand dunes.</p> <p>Less than 1 per cent of the area is floodplain grazing marsh, as are reedbeds, lowland meadows and fens and calcareous grassland.</p> <p>Within the farmed environment there are limited areas of semi-natural habitats. There are potential nectar sources from the marginal riparian habitats along canals/ watercourses. Also important are the small areas of woodland as these provide locations for food and hibernation.</p> <p>The area is poorly served by pollinators as large sections of landscape become increasingly devoid of semi-natural habitats on which the pollinators depend for food and shelter. Such habitats are often isolated pockets with species-rich buffers, margins and verges providing valuable food and shelter for pollinators.</p> <p>There has been a severe decline in wild and managed pollinator numbers over the last 30 years. Pollinating insects are generally supported by a range of semi-natural habitats, in particular, species-rich grasslands.</p>	Local	<p>Semi-natural vegetation is fragmented due to land drainage and the predominance of arable farming with its large field patterns bounded mainly by drainage ditches.</p> <p>Hedgerows are generally found further inland on higher ground but the most extensive semi-natural habitat and nectar source is flood plain grazing marsh.</p> <p>Some food crops, such as oilseed rape, benefit from insect pollination. These crops may become more widespread in the future if demand increases.</p> <p>The most extensive semi-natural habitat should be restored and maintained. Sensitive management of hedges and verges in the agricultural landscape will allow plants to flower and improve availability to pollinators. A greater network of semi-natural habitats located next to food crops, will aid pollination and provide a wider choice of food crops in the future.</p>	<p>Seek opportunities to introduce flower-rich grasslands within arable areas, creating habitat networks where possible.</p> <p>Protect areas of salt marsh and create, restore and maintain semi-natural habitats such as flood plain grazing marsh, coastal grassland and hedgerows.</p> <p>Encourage sustainable farming practices such as uncropped field margins and planting of pollen and nectar mixes that increase habitat connectivity; manage boundary features/roadside verges to extend flowering time.</p> <p>Encourage partnership working with a range of organisations such as The Wildlife Trust and Life on the Verge project, to manage road side verges so that they produce a range of flowering species/ nectar sources.</p>	<p>Pollination</p> <p>Food provision</p> <p>Pest regulation</p> <p>Biodiversity</p> <p>Sense of place / inspiration</p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pest regulation	<p>Areas of semi-natural habitat</p> <p>Flood plain grazing marsh</p> <p>Hedgerows</p> <p>Ancient woodland</p> <p>Riparian grassland</p> <p>Roadside verges</p>	<p>A variety of semi-natural habitats support populations of pest-regulating species. In the NCA these are fragmented due to land drainage and the predominance of large field patterns bounded largely by drainage ditches.</p> <p>The extent of species-rich grassland is low but hedgerows are found on higher ground, Riparian grassland is found along the canals and other watercourses and flood plain grazing marsh.</p>	Local	Certain habitats provide important overwintering areas for beneficial predatory invertebrates, for example beetles.	<p>A stronger and wider network of semi-natural habitats could provide benefits for pest regulation, biodiversity and pollination.</p> <p>Increase the diversity of the structure and composition of semi-natural habitats to support a variety of pest-regulating species.</p>	<p>Pest regulation</p> <p>Food provision</p> <p>Pollination</p> <p>Biodiversity</p>

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<p>Regulating coastal erosion and flooding</p> <p><i>continued on next page</i></p>	<p>Salt marsh</p> <p>Natural sand dune defences</p> <p>Sedimentation</p>	<p>The Lincolnshire coast is experiencing rising sea levels which, when combined with high river flows can result in significant flooding. The whole NCA falls within a flood risk area and, reflecting this risk, essentially the entire area is protected by artificial flood defences.</p> <p>Major flooding occurred in 1953 and the main artificial flood defences were constructed after this event.</p> <p>There are several active and relict sea banks parallel to the coast. Much of the coast is made up of salt marsh and dune systems which are well-preserved. Their preservation can be attributed to the Royal Air Force bombing ranges along the coast and more recently to the establishment of a number of nature reserves.</p> <p>In order to reduce erosion since 1994, 'beach nourishment' in the form of replenishment of sand has been carried out at places of greatest erosion; Trusthorpe, Boygrift, Wolla Bank/ Chapel Six Marshes, Trunch Lane and Ingoldmells.</p> <p>The salt marshes are currently increasing in area, affording further natural protection for the coastline. Where possible, natural processes should be allowed to continue and any modification to sea defences should seek to recognise the importance of</p>	National	<p>Sea level rise and climate trends show that the low-lying landscape of the NCA is at risk from flooding. Settlements along the coast are at risk of flooding.</p> <p>Tidal flooding, exacerbated by rising sea levels and combined with high river flows and rainfall, represents a high risk, as much of the developed area is below high tide levels and its drainage infrastructure struggles to cope with extreme events.</p> <p>Wetlands and coastal habitats offer essential buffers to safeguard human life and property during extreme flooding events. Natural sea defences to coastal flooding are a cost effective answer.</p> <p>Essential coastal processes occurring on the North Sea coast carry sediment south to the Lincolnshire coast and the Wash, where it feeds beaches and through accretion helps intertidal habitats adjust to rising sea-levels. However, the hard defences on the coastline interrupt this natural sediment transfer.</p> <p>The Flamborough Head to Gibraltar Point Shoreline Management Plan¹¹ (SMP) proposes future policy.</p> <p>The policy approach is to hold the line and the existing sea bank alignments. The SMP policies should guide developments in flood prone, vulnerable areas.</p> <p>The Flamborough Head to Gibraltar Point (SMP) policy along this coastline aims to ensure the continued protection from coastal flooding of the towns, while allowing the continuation of natural processes along the remainder of the coast.</p> <p>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.</p>	<p>Monitor processes and work with partners to find solutions that enable dynamic coastal processes to continue, taking into account the need to protect access to key facilities.</p> <p>Seek opportunities to create fresh water habitats, wetland habitats, and brackish water bodies to compensate for those lost through rising sea levels.</p> <p>The Lincolnshire Coastal Grazing Marshes support traditional livestock, producing high value products as well as supporting employment and rural income.</p> <p>Seek opportunities to move flood defences inland, thus ensuring that intertidal habitats can expand and respond to rising sea levels.</p> <p>Ensure that realignments are managed so that inter-tidal habitats can develop and expand effectively. Monitor processes and work with partners to find solutions that enable dynamic coastal processes to continue, taking into account the need to protect access to key facilities.</p>	<p>Regulating coastal erosion and flooding</p> <p>Sense of place/ inspiration</p> <p>Biodiversity</p> <p>Geodiversity</p>

¹¹ Flamborough Head to Gibraltar Point Shoreline Management Plan, Humber Estuary Coastal Authorities Group

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<p>Regulating coastal erosion and flooding</p> <p><i>continued from previous page</i></p>		<p>natural processes. Over the medium and long term, it is probable that the balance of salt marsh and mudflats will change through erosion as a result of climate change. This will increase coastal squeeze where the salt marsh is constrained by coastal defences on its landward side. In the short term, the policy approach is to hold the existing sea bank alignments and in the medium and long term, landward realignment will need to be considered as an alternative to holding the line.</p>		<p>The approach to the management of coastal defences on the south shore of the Humber is generally to 'hold the existing defence line'. The approach also ensures continued protection of the Theddlethorpe Gas Terminal from coastal erosion. No active intervention will occur in areas where the maintenance of defences becomes uneconomic. In some areas flood defences will be moved through managed realignment to create intertidal habitat and also provide flood storage to help manage water levels.</p> <p>Current data suggests that a breach may occur within five to ten years (2012–2022)^{12, 13}.</p> <p>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.</p>	<p>Protect coastal sand dune system from damage resulting from recreational pressure and raise awareness of local issues and the seascape.</p>	

¹² The Humber Flood Risk Management Strategy, Environment Agency (March 2008)

¹³ Flamborough Head to Gibraltar Point Shoreline Management Plan: Non-Technical Summary, Consultation Draft, Humber Estuary Coastal Authorities Group (2009)

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Sense of place / inspiration	<p>Biodiversity</p> <p>Grazing marshes</p> <p>Expansive views</p> <p>Flat, low-lying landscape with big open skies and a lack of trees</p> <p>Quiet rural area</p> <p>Food provision</p> <p>Remote locations</p> <p>Contrasts with busy industrial areas</p>	<p>The area has a distinct sense of place because of its open, flat and low-lying nature and dispersed settlement pattern which give it an isolated and tranquil character.</p> <p>The wild coast in particular provides a sense of place.</p> <p>The mix of coastal influences, modern industrial complexes and agriculture give the area its particular character.</p> <p>With the tourist centres of Skegness, Mablethorpe and Cleethorpes, this is one of the most visited areas of the East Coast.</p> <p>The area is recognised for its open agricultural landscape, numerous 'mar' drains and dykes, streams and areas of the coast managed for wildlife.</p> <p>An NCA within which falls a small part of the Lincolnshire Wolds Area of Outstanding Natural Beauty.</p> <p>Distinctive areas designated for their biodiversity. International interest (Ramsar); European (SPA and SAC); national designations (SSSI).</p> <p>Inspiring geology, habitats and landscapes with distinctive focal points including Donna Nook NNR and Gibraltar Point.</p> <p>A landscape with a strong sense of belonging reflected in village communities and seaside accommodation.</p> <p>A popular east coast tourist destination accessible by rail such as Skegness, with its good coastal access.</p> <p>Historic towns such as Grimsby, with its strong heritage interest.</p> <p>A concentration of RAF bases at Strubby, Manby, North Cotes and Donna Nook, which are of historical importance. Some RAF Second World War buildings are listed.</p> <p>On the coast the wind is a key characteristic of the landscape experience.</p>	Regional	<p>The tidal nature of the coastline along with the weather provides a very changeable landscape on the coast. Inland the change is less obvious.</p> <p>Although agricultural areas predominate, more remote and natural areas are also found in the coastal grazing marshes,</p> <p>A sense of wildness offers inspiring experiences, for example Donna Nook NNR.</p> <p>Maintain the expansive character of area including long views and tranquil areas and coastal links to the Lincolnshire Wolds.</p> <p>Offshore wind farms are changing the character of this landscape. The size of the individual units, the area covered by wind farms and the cumulative effect of their locations are having a significant impact on the long views within/ out this NCA.</p> <p>Currently tourism peaks sharply in the summer and changes the experience.</p> <p>Coastal grazing marshes provide opportunities for food production at the same time benefiting biodiversity.</p>	<p>Explore opportunities to increase sustainable tourism throughout the season. Such initiatives need to improve visitors' enjoyment, understanding and environmental awareness. Support the local economy while protecting the special qualities of the area.</p> <p>There are opportunities to improve green infrastructure links from the coastal towns through the development of green tourism. Plan new developments so that views are retained.</p> <p>Improve access to flood banks so that more people can benefit from the distinctive shoreline.</p> <p>Improve understanding of the many features and functions of the marine/coastal area including the changing geomorphological processes and wildlife resource.</p> <p>There is an opportunity to raise awareness of birdlife and biodiversity of the wider area and to include farmland birds through partnerships such as the Wildlife Trust's 'Living Landscapes'¹⁴ conservation plan.</p>	<p>Biodiversity</p> <p>Recreation</p> <p>Sense of place/ inspiration</p> <p>Food provision</p> <p>Tranquillity</p>

¹⁴ Lincolnshire Wildlife Trust Living Landscapes (www.lincstrust.org.uk/conservation)-www.lincstrust.org.uk/conservation

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Sense of history	Archaeological remains	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, drains, flood protection and early pumping systems.	Regional	A landscape where its cultural heritage is less well- recognised - the ancient field systems and the history bound up with the management of the marsh.	Improve understanding and interpretation and enjoyment of past activities and cultural heritage.	Sense of history Sense of place/ inspiration Biodiversity Geodiversity Recreation
	Drainage history	The wetlands preserve nationally-important palaeo-environmental and archaeological evidence.		There is a strong maritime influence on the landscape with much of the land reclaimed from the sea over several centuries.	Protect, conserve and enhance features of historic interest above/ below ground and their setting.	
	Ridge and Furrow	The smaller settlements retain much of their historic character with little additional development. The isolated farmsteads scattered across the NCA have expanded significantly to include modern barns.		There is also historic interest in villages, along with evidence of early industrial activity.	Conserve soil resources to protect buried features of archaeological or historic interest.	
	Coastal management features	The cores of the settlements from Humberston to Healing are well-preserved and identifiable from medieval churches and 18th-and 19th-century red brick buildings.		A sense of history is associated with the medieval dispersed settlement patterns, field systems and ancient churches.	Through partnership working, raise awareness of the historic assets, such as parklands and ridge and furrow grassland in the area, to increase knowledge about the landscape and its diversity and heritage value.	
	Sea fishing and coastal heritage	A nucleated pattern of settlement is characteristic such as Alford while in the Outmarsh a dispersed settlement pattern is more characteristic.		The ancient field systems and the history of the management of the marsh have the potential to be more widely interpreted.	Aspects of social history that are important include the large estates of Brocklesby and Gunby Hall.	
	Scheduled monuments	Agricultural land retains old enclosures – old marshland drainage and reclamation – but there are also some planned enclosures dating from the 18th- and 19th-century.		A number of parklands present today such as Gunby Hall, Well Vale Hall and Brocklesby, are under favourable management.	Seek opportunities to promote awareness of more recent history-using Second World War structures like hangars –which are listed and an important tourism asset for the area.	
	Geological features	Environmental records are preserved within the sediments and well-preserved remains of prehistoric landscapes that become exposed. Archaeology including from the Bronze Age and Roman.		Restoration of historic features should use local materials and respect local styles.	Raise awareness of fishing and coastal heritage of the area including Grimsby Docks.	
	Characteristic buildings and architecture	There are several scheduled monuments and 957 Listed Buildings.		Historic Second World War assets and RAF bases and their Listed Buildings are of historical importance.		
	Parklands	A landscape where its cultural heritage is less well-recognised –the ancient field systems and the history bound up with the management of the marsh are not widely appreciated.		The fishing industry provides a link with the sea –particularly around Grimsby, and this industry has changed dramatically in more recent years.		
	Military history and defences	There is a range of designated and undesignated heritage assets that reflects human use of the area. Historic parkland decreased significantly during the 20th century, with important areas remaining. Also, a concentration of war- time defences/RAF bases at Strubby, Manby, North Cotes and Donna Nook are historically important.		A landscape where the daily opportunity for people to have access to nature offers inspiration. The Coast and Marshes has the potential for more people to enjoy and understand its historic features and landscapes through improved interpretation, education and access.		

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	<p>A generally flat low-lying topography</p> <p>Remote locations such as Gibraltar Point and Donna Nook</p> <p>Sparse settlement patterns</p> <p>Open views</p> <p>Sea views towards and from the coast.</p> <p>Undisturbed remote areas</p>	<p>There are a few industrialised areas and Grimsby Port that contrast sharply with the predominantly rural and tranquil areas.</p> <p>According to the CPRE Intrusion Map (2007) 61 per cent of the area is still undisturbed with the landscape offering a strong sense of tranquillity away from the more settled areas. A sense of isolation exists in much of the area, with few major roads and a sparse population.</p> <p>Areas of greatest tranquillity are those away from settlements and transport networks where 'dark skies' also feature in much of the NCA at night.</p> <p>With more industrial activity, the conurbations of Grimsby and Cleethorpes have lower tranquillity scores.</p>	Regional	<p>Retain the contrasts between busy, active areas and more remote rural and wilder areas. This will require containment of development into busy areas and control of intrusive elements such as lighting.</p> <p>This area is predominantly flat with generally wide open views across long distances, big open skies and a landscape offering a strong sense of tranquillity.</p> <p>The exceptions are around the main coastal resorts and the access routes to them and other main roads. In addition there is weekly practice by the RAF at Donna Nook bombing range.</p> <p>Industry is present and dominates the landscape in places around Grimsby, including large constructions and industrial turbines for renewable energy.</p>	<p>Encourage sensitively- sited development maintaining long and open views and strong sense of place</p> <p>Minimise light spill, particularly in areas which are undisturbed, and allow dark skies to prevail at night allowing for the study of astronomy and giving more natural night-time environments.¹⁵</p>	<p>Tranquillity</p> <p>Sense of history</p> <p>Recreation</p> <p>Sense of place/ inspiration</p>

¹⁵ Dark Skies (www.darkskydiscovery.org.uk)

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Recreation	<p>Coast</p> <p>Public rights of way</p> <p>Network of parks and open spaces</p> <p>Nature reserves/ National Nature Reserves</p>	<p>The east coast has been an important tourist destination since the late 19th century.</p> <p>Today part of the area includes some communities with multiple deprivations such as Grimsby.</p> <p>With the coastal tourist centres of Skegness, Mablethorpe and Cleethorpes,, and the concentration of historic Second World War RAF bases, the area is one of the most highly-visited areas of the east coast. This is very highly concentrated in and around the main holiday centres so that much of the coastal hinterland is relatively quiet and unvisited. A number of smaller coastal settlements also exist (such as Chapel St Leonards, Ingoldmells and Anderby Creek).</p> <p>The rights of way network in the NCA is moderate (1.4 per cent of the NCA with a density of only 0.8 km per km²) and no National Trails reflecting its historic inaccessibility. Rights of way afford the visitor opportunities to explore the landscape beyond the sea bank and provide opportunities to improve the recreational usage of links between the coastal towns.</p> <p>Promoted routes exist at NNRs and in the Lincolnshire Coastal Country Park (LCCP). Numerous nature reserves and sea bank clay pits are regularly visited.</p> <p>The NCA covers a large proportion of the Lincolnshire coastline of which approximately 65 per cent is already open and the subject of legal access rights. Much of this access is along hard structures such as promenades, along sea walls and defensive sea banks. Much of the remaining third of the coast is also accessible to pedestrian visitors, but the access is permissive in nature.</p> <p>Some access to the coast exists but areas of highest use are where beaches have nearby parking/coastal settlements.</p> <p>The NNRs covering 837 ha are excellent for bird watching and educational activities with seal-watching being particularly popular at Donna Nook NNR.</p> <p>A North Sea observatory is also proposed at Chapel Point. Gibraltar Point offers an important location for visitors to experience coastal habitats.</p> <p>There is coarse and trout fishing on many of the waters that flow through the NCA.</p> <p>Adjacent to the NCA lies the Lincolnshire Wolds AONB which attracts visitors for its tranquillity and for walking. There are access routes linking these areas such as those along the Louth Canal.</p>	Regional	<p>The tourism industry forms an important part of the area's local economy and tourism on the coast peaks sharply in the summer with sea bathing, sun- bathing and water sports being popular. Some of the sandy beaches have Blue Flag status.</p> <p>The undeveloped/ wild coast has potential for green tourism.</p> <p>Away from the coast the landscape offers opportunities, albeit limited, for distinctive, low-key, informal recreation.</p> <p>Maximise the recreational benefits provided by the coast while protecting the area and landscape.</p> <p>Promoted routes exist at NNRs and in the LCCP, with opportunities to develop more in the future.</p> <p>Access and public rights of way are limited for example, around Grimsby. Improve the health and wellbeing of the people living in areas (particularly within wards with multiple deprivation).</p> <p>A significant resource for tranquillity is offered, especially in winter.</p> <p>The marshes and open rural landscape offer opportunities for development of green tourism.</p>	<p>Work in partnership to promote green tourism opportunities throughout the year and reduce environmental damage due to tourism pressure.</p> <p>Provide interpretation of the history, biodiversity, geodiversity and other aspects of the landscape in well- visited locations. Identify areas where access is currently poor and extend access while avoiding adverse impacts. Avoid developing access into areas where species need protection, such as overwintering birds.</p> <p>Support well-planned green infrastructure to provide sustainable access routes that enhance community safety, foster community cohesion and contribute to people's physical health and well-being.</p> <p>Improve people's understanding of the area.</p> <p>Link public footpaths and settlements, especially on rising ground, so as to be resilient to potential rising water levels.</p> <p>During the development of coastal access, ensure that the habitats are protected from damage resulting from excessive recreational pressure.</p> <p>Development in relation to recreation will need to be appropriate and phased and sensitive to the needs of the natural environment including the marine environment.</p>	<p>Recreation</p> <p>Sense of history</p> <p>Sense of place/ inspiration</p>

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
<p>Biodiversity</p> <p><i>continued on next page</i></p>	<p>Internationally, nationally and locally-protected sites</p> <p>European Marine Site– Gibraltar Point Special Protection Area (SPA)</p> <p>Saltfleetby-Theddlethorpe Dunes and Gibraltar Point Special Area of Conservation (SAC)</p> <p>Coastal features including intertidal areas, coastal lagoons, sand dunes and mudflats</p> <p>NNRs</p> <p>SSSI</p> <p>Semi natural habitats</p> <p>Floodplain grazing marsh</p>	<p>A number of sites have been notified for their international importance for wildlife because the habitats they contain support assemblages of breeding birds and overwintering species.</p> <p>Gibraltar Point is an internationally recognised Ramsar Site –as is the adjacent NCA area of The Wash.</p> <p>The majority of the coastline is internationally designated for its biodiversity with sites of conservation importance (excluding the stretch of coast between Skegness to Mablethorpe).</p> <p>The SPA and SAC exist covering marine and terrestrial environments.</p> <p>Specific areas of coast are managed for wildlife, for example, Saltfleetby and Theddlethorpe Dunes NNR. An ancient calcareous dune system contains freshwater marsh and maritime fen is located south of Saltfleet Haven.</p> <p>The coastal saline lagoons hold rare species.</p> <p>Reedbeds cover over 349 ha of the NCA and are located in the wet areas on the Outmarsh.</p>	<p>International</p>	<p>The Lincolnshire Coast and Marshes are of international importance for their biodiversity.</p> <p>The salt marshes, dunes and freshwater marsh and maritime fen provide habitats for species including little tern, redshank, lapwing ringed plover, whitethroat and lesser whitethroat.</p> <p>The waterbird assemblage is significant and important. European non-breeding birds include grey plover, sanderling, bar-tailed godwit and red knot.</p> <p>Conservation objectives are set for each habitat or species of the SPA/SAC.</p> <p>Species include water shrew, natterjack toad, common lizard and a colony of grey seals.</p> <p>Chalk streams remain under threat from excessive water extraction, physical modification, pollution, intensive fisheries management, urban development and invasive species.</p> <p>The chemical status of the groundwater in the northern half of the NCA, the main chalk aquifer, is classified as poor.</p>	<p>Enhance the coastal habitats working with the relevant landowners and partners using the Flamborough Head to Gibraltar Point Shoreline Management Plan to guide proposals.</p> <p>Manage intertidal habitats such as sand dunes and saline lagoons. Raise awareness of their importance linked with the marine environment and working in partnership with NNRS.</p> <p>Working in partnership with, for example, the Lincolnshire Wildlife Trust/South Humber Bank Ecology Group, to secure areas of strategic habitat</p> <p>Work with farmers and landowners by encouraging maintenance, restoration and creation of flood plain grazing marsh, woodlands, lowland grassland meadows and fen.</p> <p>Work with farmers and landowners to adopt management interventions that will protect or improve habitats as well as water resources by creating buffer strips of meadow grassland to accommodate habitat change, creating more species-rich grassland.</p> <p>Ensure that the network of ditches is well- managed so that they provide suitable habitats for rare species including protected species such as water vole and other wildlife.</p> <p>Survey and monitor the ditch flora and fauna to understand the impact that changing nutrient levels are having on the biodiversity of this habitat.</p> <p>Seek opportunities to buffer and expand existing semi-natural habitats, to link them with grassland strips and create connecting networks to enable species movement.</p>	<p>Biodiversity</p> <p>Geodiversity</p> <p>Sense of place/ inspiration</p> <p>Recreation</p> <p>Water availability</p> <p>Regulating coastal erosion and flooding</p> <p>Tranquillity</p> <p>Regulating water quality</p> <p>Regulating soil erosion</p> <p>Regulating soil quality</p> <p>Climate regulation</p>

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Biodiversity <i>continued from previous page</i>	Fen Farmland bird assemblage species Overwintering wildfowl Riparian grassland Broadleaved and mixed woodland Chalk streams/blow wells Reedbeds	<p>There are neutral and wet grasslands, including important areas at Lindsey Outmarsh.</p> <p>Gibraltar Point SPA forms part of the The Wash and North Norfolk Coast European Marine Site. There are extensive mildly calcareous dunes and salt marshes in the SPA.</p> <p>The mixture of habitats provides important feeding, roosting and resting areas for birds on passage and through the winter.</p> <p>Arable birds– nationally important assemblages of arable birds are present on farmlands of the NCA.</p> <p>The lowland calcareous grasslands and floodplain grazing marsh and the 39 ha of lowland hay meadows–traditional agricultural practices are important.</p> <p>3 per cent of the area is SSSI. Of these sites 78 per cent are 'favourable management' and 22 per cent are in a status of 'recovering'.</p> <p>A host of protected species are found in the NCA including grey seal, water vole and barn owl. A number of species have action plans for their recovery.</p>		<p>Gibraltar Point is a key insect site and there are also mammals associated with the reserve including seal species. Gibraltar Point SPA has breeding birds such as little tern, redshank, lapwing ringed plover (in nationally important numbers), whitethroat and lesser whitethroat.</p> <p>The water bird assemblage is significant and important European non-breeding birds include grey plover, sanderling, bar-tailed godwit and red knot.</p>	<p>Ensure that the land used by bird populations for foraging and roosting outside the designated areas is adequately protected and managed.</p> <p>Provide habitats for farmland bird species such as grey partridge, skylark, barn owl, tree sparrow, yellowhammer and linnet.</p> <p>Ensure farming practice within the wider landscape makes provision for ground nesting birds. Plant bird seed mixtures for spring and winter food and create a network of insect- rich habitats throughout arable areas and grasslands.</p> <p>Seek opportunities for regeneration/creation of semi-natural vegetation landscape.</p> <p>Protect and manage the chalk streams throughout the catchments with advice from partners including the Lincolnshire Chalk Streams Project and guidance from the Lincolnshire Wolds AONB Management Plan.</p> <p>Increase the area of grazing marsh in good biological condition to benefit water quality and provide semi-natural habitat for a range of rare species.</p> <p>Explore opportunities for partnership working with, for example, the Lincolnshire Wildlife Trust and, in the Lincolnshire Grazing Marshes Project, target areas to increase ecological resilience.</p> <p>Secure the opportunities that exist for improving access and engagement. Seek opportunities to raise awareness of marine and seascape issues.</p>	

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Geodiversity	<p>Geomorphological processes</p> <p>Marine alluvium of the Outmarsh</p> <p>Coastal sand dunes and marine shingle</p> <p>Soils</p> <p>Chalk streams</p>	<p>2 mixed interest SSSI, 1 geological SSSI and 8 Local Geological Sites.</p> <p>There is a constantly changing and dynamic system of accretion and erosion and in contrast to many parts of eastern England, it is still accreting. Gibraltar Point consists of a pair of almost parallel dune systems separated by salt marsh of which the innermost dunes are believed to be at least 300yearsold.</p> <p>Local building tradition demonstrated through use of local materials including greenstone used in churches and red brick and pantiles in farm buildings.</p> <p>Blow wells occur in certain locations between Barton and Tetney, for example, Tetney Blow Well (SSSI). These are the result of artesian springs where water under pressure escapes from the Chalk through structural weaknesses (lenses of sand) in the overlying till to reach the surface.</p> <p>Chalk streams on the western side of the NCA, for example, Laceby Beck, Waithe Beck, Great Eau and the River Lud.</p> <p>Chalk bedrock underlies and extends beyond the NCA with mudstone, limestone and sandstone also present.</p> <p>The area hosts one nationally designated geological site, Chapel Point to Wolla Bank SSSI, and two mixed interest SSSI of both geological and biological interest. Additionally, 8 Local Geological Sites cover 65 ha. Whilst 7 regionally important geomorphological sites cover in total 73 ha.</p> <p>Gibraltar Point SSSI is an area of some 430 ha of sandy and muddy shores, calcareous coastal dunes, salt marshes and freshwater habitats, extending for a distance of about 5 km along the Lincolnshire coast from the southern side of Skegness to the entrance of the Wash.</p>	Regional	<p>Shoreline Management Plan provides a long term plan for the coast.</p> <p>Geomorphology of the SSSI, for example, Gibraltar Point and North Somercotes, with dune sand and marine shingle which allows for interpretation, understanding and continued research into the geodiversity of the area. The sites also contribute to sense of place and history. At the SSSI at Gibraltar Point where a wide variety of coastal landforms and associated habitat types are present and its location here, on the north-western fringe of The Wash, is relatively sheltered.</p> <p>Blow wells occur where sand and gravel lenses allow water from the Chalk to reach the surface.</p>	<p>Protect and maintain views and access to geological features to provide further interpretation, research and understanding of the area's geology. Gibraltar Point offers particularly interesting geodiversity and is an important opportunity for education in the NCA.</p> <p>Conserve and enhance soil resources and geomorphology to safeguard the relationship between landscape, history of land use, wildlife, archaeological and cultural heritage.</p> <p>Promote respect and understanding for the local building traditions and architectural styles and facilitate the use of appropriate local materials.</p> <p>Where appropriate, improve and manage public access and interpretation and develop education/ recreation opportunities.</p>	<p>Geodiversity</p> <p>Regulating water quality</p> <p>Regulating water flow</p> <p>Water availability</p> <p>Biodiversity</p> <p>Recreation</p> <p>Sense of place / inspiration</p> <p>Sense of history</p> <p>Regulating coastal erosion and flooding</p>

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