National Character Area profile:

59. Wirral

Supporting documents

NATURAL ENGLAND

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Introduction

As part of Natural England's responsibilities as set out in the Natural Environment White Paper[1], Biodiversity 2020[2] and the European Landscape Convention[3], we are revising profiles for England's 159 National Character Areas (NCAs). These are areas that share similar landscape characteristics, and which follow natural lines in the landscape rather than administrative boundaries, making them a good decision-making framework for the natural environment.

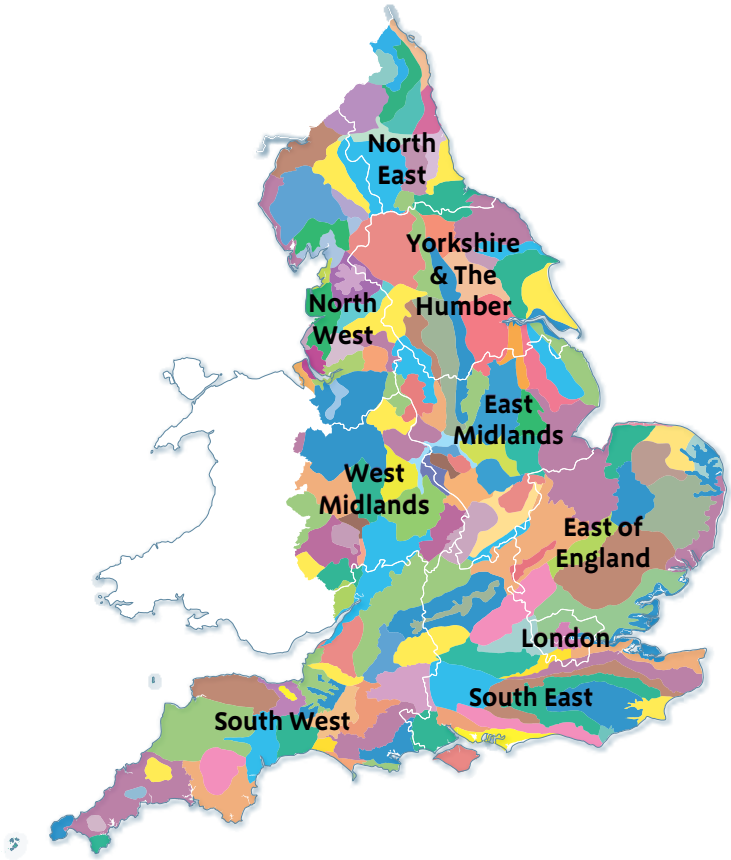
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and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

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

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

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

National Character Areas map



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

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

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

Summary

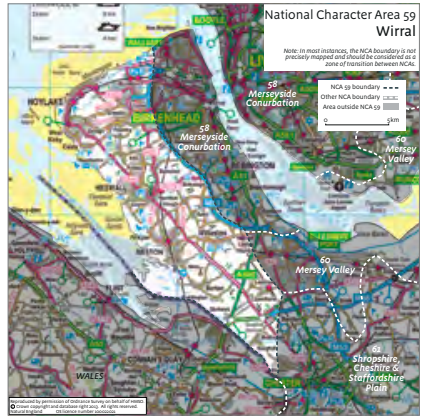
The Wirral National Character Area (NCA) is located on a peninsula formed by the Mersey and Dee estuaries. The landscape of the NCA is based on the formal landscapes of former large country estates, rural areas, natural coastal scenery and wooded sandstone ridges, which combine to give the NCA a unique character. The NCA is separated from the urban areas of east Wirral by a dramatic sandstone ridge, as well as by the M53 motorway. This is a rich pastoral landscape interspersed with settlements. Red sandstone is common; the pink hues of the local stone bring warmth to the landscape and provide a unifying theme in buildings, walls and bridges.

Lowland heathlands show a strong association with the underlying geology and are found on podsolic soils that have developed over Triassic sandstones on the Wirral. Between the Wirral and north-east Wales lies the large, funnel-shaped Dee Estuary, with extensive estuarine habitats. North Wirral Foreshore, located between the outer Dee and Mersey estuaries, has a wide stretch of coastal habitats. Both the Dee Estuary and North Wirral Foreshore are of considerable wildlife and ornithological significance, and are protected by national, European and international designations. Parts of north Wirral are drained by the River Birket and its tributaries. Much of the farmland provides wildlife habitat, including for feeding and roosting birds. Open land, where not farmed, often has uses such as grazing for horses, or golf courses.

The coastal and estuarine landscapes are popular visitor destinations, offering opportunities for recreation associated with wildlife, such as birdwatching. The network of green infrastructure, including Local Nature Reserves and country parks, provides locations for people to enjoy the natural environment, in addition to supporting biodiversity and enhancing the landscape. Habitats such as intertidal mudflats and sand flats, coastal salt marshes and coastal sand dunes can provide a cost-effective defence against erosion and flooding.

Maintaining water quality is important, as there are bathing beaches along the coastline – and to retain the wildlife interest of the area. The Dee Estuary also supports commercial fishing, including a notable cockle fishery. Most farming is grass and uncropped land, with the mosaic of farmland features including ponds, hedgerows and red sandstone walls contributing to the character of Wirral's landscape, enhancing sense of place and providing habitats for wildlife.

Key challenges include enabling both residents and visitors to enjoy access to the coast and countryside while maintaining and managing the area's internationally, nationally and locally important habitats and species. Maintaining the local distinctiveness of Wirral's settlements and rural villages is a consideration, along with providing accessible natural greenspaces for people close to where they live and work. Addressing and adapting to climate change and coastal change are further challenges.



Click map to enlarge; click again to reduce.

High tide roost, North Wirral Foreshore.

Statements of Environmental Opportunity

- **SEO 1:** Work with natural coastal processes to conserve and enhance the dynamic estuarine and coastal landscape, with habitats such as intertidal mudflats and sand flats, coastal salt marshes and coastal sand dunes, while addressing climate change and safeguarding wildlife.

- **SEO 2:** Conserve and enhance the rolling countryside, punctuated by low sandstone outcrops, with significant lowland heathlands, woodlands and other wildlife habitats, while maintaining the long, open views over the coast and estuary that contribute to the varied sense of place.

- **SEO 3:** Work with landowners and land managers to support sustainable food production in the farmed environment while enhancing and strengthening the mosaic of farmland features including ponds, trees, hedgerows and red sandstone walls, to enhance biodiversity and improve soil and water quality, strengthen resilience of habitats to climate change and enhance landscape character.

- **SEO 4:** Safeguard and interpret Wirral's heritage, history, archaeology and geology to enhance the character of the landscape and improve people's understanding and enjoyment of the historic environment.

- **SEO 5:** Enhance people's understanding and enjoyment of the natural environment, providing interpretation and educational facilities and opportunities for experiencing wildlife, with a strong network of green infrastructure, which will bring health and wellbeing benefits for both residents and visitors.

Description

Physical and functional links to other National Character Areas

The Wirral National Character Area (NCA) is located on a peninsula formed by the Mersey and Dee estuaries. It is separated from the industrial and residential development of the Merseyside Conurbation NCA by a dramatic sandstone ridge which extends from Bidston Hill in the north through Noctorum and Mountwood to Storeton in the south. The escarpment provides a strongly contrasting setting for the two character areas. The gently rolling pastoral landscape of the Shropshire, Cheshire and Staffordshire Plain NCA lies to the south-east.

The Dee Estuary forms the south-western boundary of the Wirral NCA, while the Liverpool Bay lies to the north. The River Dee has its source in Snowdonia, Wales. Its catchment contains a wide spectrum of landscape, from high Welsh mountains and Bala Lake, through the plains of Cheshire and north Shropshire, to the vast mudflats of the Dee Estuary. The estuary forms an essential part of the route of migratory fish species, which have their breeding grounds upstream in the River Dee. A number of watercourses on the Wirral peninsula drain into the River Mersey to the north-east.

The M53 motorway acts as a divide between the Wirral NCA and the Merseyside Conurbation NCA. The highly urban Merseyside Conurbation and Mersey Valley NCAs are adjacent to the Wirral NCA. The close proximity of urban, rural and coastal landscapes leads to high public pressure on the coastal and rural areas, but also great need for the facilities they provide.

There are strong visual links, with outward views from sandstone outcrops to Mersey Estuary, Merseyside, Dee Estuary and north Wales. Physical links include rail and road connections between the Wirral NCA and the neighbouring Merseyside Conurbation, Mersey Valley, and Shropshire, Cheshire and Staffordshire Plain NCAs. The Dee Estuary is a commercial waterway providing access to the Port of Mostyn, to Shotton and to Connah's Quay.

Views from the North Wirral Foreshore towards the Merseyside Conurbation NCA.

Key characteristics

- A low-lying but gently rolling platform punctuated by low sandstone outcrops, this western portion of the Wirral peninsula stretches from the mid-Wirral sandstone ridge to the Dee Estuary.
- Geology is dominated by glacial till overlying Triassic red mudstones and sandstones, with sandstone ridges and outcrops.
- The north Wirral coast is characterised by extensive beaches along the foreshore, while the large, funnel-shaped Dee Estuary lies between the Wirral peninsula and north-east Wales.
- Drainage is into the Dee Estuary in the west and the Mersey Estuary in the east, with a network of small streams and drainage ditches.
- Woodland is predominantly broadleaved, with woodland cover on sandstone ridges, country parks and country estates.
- The formal landscape has been created by former large country estates and the core of the area is mixed agricultural land, with areas of improved pasture, arable farming and market gardens and extensive areas given over to grazing horses.
- Fields are defined by intermittent clipped hedgerows, with copses, some red sandstone walls and field ponds ('marl pits'); coastal areas often feature a geometric field pattern bounded by ditches draining former marshlands.

Fields are often defined by hedgerows and field ponds are frequent. Woodland cover can be seen on the sandstone ridges.

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Key characteristics continued

Extensive coastal saltmarshes are found in the Dee Estuary.

- This is a significant coast and estuary, with internationally, nationally and locally recognised wildlife and habitats that include intertidal mudflats, sand flats and coastal salt marshes, with coastal sand dune systems. Inland, extensive areas of lowland heathland are associated with sandstone outcrops.
- The rural landscape, with country estates, scattered farms and a mix of ancient and post-medieval fieldscapes, is interspersed with residential commuter belt development, with towns and villages coalescing due to suburban development, linked by an intricate network of lanes, bridleways and footpaths.
- Red sandstone is common throughout the area; the pink hues of the local red stone bring warmth to the landscape and provide a unifying theme in buildings, walls, bridges and churches.
- Recreation and tourism are supported by good access to the dramatic coastal landscape and its outstanding ornithological interest, with a number of country parks, Local Nature Reserves and Local Wildlife Sites; links-style golf courses are a distinctive feature along the coastline.

Wirral today

The landscape of the Wirral NCA is based on the formal landscapes of former large country estates, rural areas, natural coastal scenery and wooded sandstone ridges, which combine to give the NCA a unique landscape character. The pastoral landscape of central Wirral is separated from the industrial areas of the neighbouring Merseyside Conurbation NCA by a dramatic sandstone ridge which extends from Bidston Hill in the north through Noctorum and Mountwood to Storeton in the south. The M53 motorway provides access to this area and also separates the Wirral plain from the urban east of Wirral.

The geology of the Wirral peninsula is dominated by glacial till overlying Triassic sandstone. These combine to form a low-lying but gently rolling platform punctuated by low sandstone outcrops. The highest point is at Poll Hill, Heswall, at 106 m.

With the exception of Hoylake and West Kirby, the NCA's coastline is essentially undeveloped and is an important area for coastal-related recreation and nature conservation. The north Wirral frontage is characterised by coastal sand dunes, which are now encased or separated from natural interaction with the foreshore by artificial defences, low-lying hinterland and extensive sandy and muddy/sandy beaches. Between the Wirral and north-east Wales lies the large, funnel-shaped Dee Estuary. The three small, low-lying sandstone islands of Hilbre are located approximately 1 km off the extreme north-west corner of the Wirral peninsula. The coastline and estuary are of international importance for wildlife.

The River Dee is 110 km long from its source in Snowdonia National Park in Wales to where its estuary discharges into Liverpool Bay. The River Dee is normally tidal up to Chester Weir. There are a number of watercourses through the Wirral. The south-western part of the NCA contains streams draining to the Dee Estuary.

Most small rivers in the north of the peninsula drain into the Birket, which itself flows into the River Mersey via Wallasey Pool (Birkenhead Docks), while Clatter Brook and the River Dibbin drain into the Mersey at Bromborough Pool.

Woodland is predominantly broadleaved and is primarily associated with sandstone ridges, country parks and country estates. Pockets of woodland often create the impression of considerable woodland being present.

North Wirral Foreshore, located between the outer Dee and Mersey estuaries, is an area of international importance for wildlife, with intertidal sandflats and mudflats, and embryonic coastal saltmarsh.

The core of this area is predominantly mixed agricultural land, with areas of improved pasture, arable farming and market gardens. The majority of the agricultural land is Grade 3, with pockets of Grade 2 present around Thornton Hough and Hoylake. Grade 4 land is situated to the south of Hoylake, where the land is low lying, with numerous drainage ditches. A number of birds rely on both grass and arable farmland areas for feeding. There is a low-lying, flat area across the north end of Wirral, immediately inland of the coastal strip, which is poorly drained by small rivers of the Birket catchment. Parts of this area provide roosting areas for wintering birds and support other wildlife such as water voles. This area is largely grazing for cattle and horses, but with some remaining horticulture.

The field pattern results from the enclosure and re-organisation of a mix of medieval townfields and ancient fields. Fields are generally medium sized, defined by intermittent clipped hedgerows, often replaced by post-and-wire fences. Field ponds and copses are important features. Boundaries in residential areas and surrounding country estates are predominantly red sandstone walls, which is a common theme running throughout the Wirral. In coastal areas, low-lying farmland is often bounded by drainage ditches or hedges characterised by gorse scrub.

The Dee Estuary consists of extensive intertidal sand flats, mudflats and coastal salt marshes. The estuary is internationally important for waders and wildfowl. The estuary also forms an essential part of the route for migratory fish species that depend on the whole river ecosystem, including the River Dee and Bala Lake Special Area of Conservation (SAC), which lies upstream. North Wirral Foreshore, located between the outer Dee and Mersey estuaries, is an area of intertidal sand flats and mudflats, with embryonic coastal salt marsh, which is of international importance as a feeding and roosting site for passage and wintering flocks of waders, wildfowl, terns and gulls.

The Dee Estuary is of international importance and is designated as a Ramsar site and Special Protection Area (SPA). The Dee Estuary (including the North Wirral Foreshore) is also designated as an SAC. The Mersey Narrows and North Wirral Foreshore is a Ramsar site and SPA.

The eastern shore of the Dee Estuary is backed by a stretch of till cliffs. Further along the coast to the north, small relic fragments of coastal sand dunes are found, particularly at Meols. The coastal sand dunes at Red Rocks Site of Special Scientific Interest support a re-introduced population of natterjack toad. Lowland heathlands show a strong association with the underlying geology and soils and are found on podsolic soils that have developed over Triassic sandstones, such as on Thurstaston Common. A notable feature is the many marl pits, formed where calcareous clay in the soil has been dug up and spread on the land. Water-filled marl pits constitute a significant wetland resource, providing an important network of infield ponds, in which great crested newts are often found.

The towns and villages, such as Heswall, Hoylake and West Kirby, which developed as dormitory settlements, feature a mixture of traditional sandstone buildings and modern post-Second World War housing development. Increased pressure for accommodation in this commuter belt has led to the expansion of many of the settlements, resulting in gradual coalescence.

Red sandstone is common throughout the area, with many churches and houses in the villages built from sandstone. Welsh slate and tile roofs predominate. The pink hues of the local red stone bring warmth to the landscape and provide a unifying theme in buildings, walls and bridges. Traditional timber-framed structures including cruck frames are now very rare compared with later sandstone and brick.

This is a rich pastoral landscape interspersed with settlements, scattered farmsteads and many garden centres. Long-known as a commuter belt for wealthy businesspeople, the area is prosperous, with many large houses and country estates predominantly built using local red sandstones. Settlements are linked by an intricate network of lanes, bridleways and footpaths.

The area's coastline, countryside and parks are a vital resource of tranquillity in an area classified as untranquil to moderately tranquil.

Recreation and tourism are supported by good access to the dramatic coastal landscape and its outstanding ornithological interest. There are a number of country parks, Local Nature Reserves and Local Wildlife Sites. There are a large number of golf courses on the coastal strip and in the rural areas, some of which include good wildlife habitat. The Wirral Way is a path on the track of an old railway that runs from West Kirby to Hooton in mid-Wirral as part of the Wirral Country Park. Wirral has designated bathing waters at West Kirby, Meols and Moreton.

The landscape through time

The Triassic Period (248–205 million years ago) is represented by red mudstones and sandstones that underlie virtually the entire area, with the sandstones forming the higher ground at the northern end of the Wirral. The only exception to this is a small area of Carboniferous sandstone and shales near Neston. The sandstones, where present close to the surface, give rise to free-draining soils that support lowland heathland vegetation such as at Thurstaston, on the Wirral. The harder coarse red Triassic sandstones out-crop in many parts of Wirral.

The main deposit of Quaternary age is till, which formed in and beneath glaciers and ice sheets. During the last glacial advance some 20,000 years ago, ice invaded from the Irish Sea area and deposited till, sands and gravels over much of the Merseyside area. Also associated with the glacial advance are deposits of fine, wind-transported silt known as loess.

There is some evidence to suggest that the Wirral peninsula was occupied or used extensively during the Mesolithic Period, with strong evidence for at least one permanent settlement at Greasby dating to c. 7000 BC.

Red sandstones outcrop in many parts of the Wirral, including at Hilbre Island at the mouth of the Dee Estuary.

Sea levels in the area have changed a number of times since the last glaciation. The 5,000-year-old submerged remains of a post-glacial forest on the Meols foreshore indicate that much of the Wirral at that time was some distance from the coast.

The remains of a small iron-age fort are present at Burton in the south-west of the area, on the outskirts of Chester. A Romano-British presence on the Wirral is evident, related to the occupation of Chester. A major Roman port was established in the former tidal pool of the River Dee at Chester. Roman roads are found near Willaston and Ledsham, and other traces of early Roman activity have been found at Meols. Meols developed as a port potentially from the Iron Age, but was also active in the Roman period from the mid-1st century to the late 4th century.

The eastern shore of the Dee Estuary is backed by a stretch of till cliffs between Heswall and Hoylake.

Following the cessation of Roman governance, Meols seems to have continued to operate as a port, as indicated by the discovery of a sizeable early medieval finds assemblage.

There is evidence that Vikings, expelled from Ireland, settled on the Wirral. The north-west corner of the Wirral peninsula has a concentration of Scandinavian place names; however, only a few – such as Meols ('sandbank') – have retained their pure Scandinavian form.

At the time of the Norman invasion the Wirral was an area of small, dispersed settlements supporting fishing or farming communities. Much of the Wirral became an extensive Royal Hunting Forest in the 12th century, and was subject to Forest Law.

The pattern of early settlement was largely nucleated, and the vestiges of townfield agriculture (in the curved boundaries of strip farming preserved in later enclosures) can still be detected along the peninsula. Ancient enclosure reflecting a more dispersed pattern of farm holdings is also evident, although planned and regular late post-medieval field patterns dominate.

From the late 18th century, agriculture developed to provide meat, dairy, arable and horticultural products to serve the growing needs of the urban populations. Numerous field ponds were dug to extract the calcareous marl deposits that were widely used as a mineral fertiliser, with these 'pits' later providing a means of watering livestock. Tower mills (a type of windmill) and the remains of mills (mill mounds) are a distinctive feature of the Wirral, indicating a thriving arable economy in the 18th and 19th centuries. Dispersed and loose courtyard steadings, with buildings dating generally from the late 18th century, include two-storey combination barns.

The Dee Estuary and the ports along it, at Parkgate for example, historically provided access to Chester. The port at Chester functioned throughout the medieval period, but progressive silting of the River Dee and changes in sea level meant that 'satellite' anchorages had to be established along the Dee shore of the Wirral. These included Neston, Shotwick, Parkgate and Caldy. The canalisation of the River Dee (the New Cut) in the 18th century enabled larger ships to reach Chester, extending its role as a port.

The increased reliability of steam-powered boats in the 1820s encouraged wealthy Liverpool businessmen and merchants to establish country houses and estates on the Wirral. The introduction of the Wirral's first railway in 1840 further encouraged settlement in the area, which has continued up to the present day. Towns and villages developed as dormitory settlements for Liverpool, Birkenhead, Ellesmere Port and Chester. Nineteenth-century villas are a characteristic feature.

The Dee Estuary is rapidly silting up, with marsh-fringed inlets now almost filled with tidal mudflats and coastal salt marshes. The former port at Parkgate, one of the country's principal producers of shrimps and a former embarkation point for Ireland, is now separated from the water channel by a broad salt marsh that has developed on Gayton Sands. Coastal salt marshes have spread considerably since common cord-grass was introduced to the area prior to the Second World War. Silting-up continues, with coastal accretion largely from long-shore drift. The 20th century, especially since the Second World War, has also seen a considerable increase in the development of recreational and leisure facilities, with increased mobility of the population and building of major roads such as the M53. There has been an overall decline in woodland cover, with more deforestation than afforestation.

Ecosystem services

The Wirral 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 Wirral NCA is contained in the 'Analysis' section of this document.

Provisioning services (food, fibre and water supply)

- **Food provision:** Most farming is grass and uncropped land, with cattle being the most prominent livestock, followed by sheep. There are also pockets of arable land and market gardening. The Dee Estuary supports commercial fishing, including an important cockle fishery.

- **Water availability**: The Permo-Triassic sandstones form an important aquifer, supplying licensed groundwater abstractions. Groundwater provides drinking water for both public and private water supplies, and water for agriculture and industry. It provides a source of base flow to maintain river quality.

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

- **Regulating water quality:** The tidal Dee catchment covers streams and rivers that flow directly to the Dee Estuary on both the English and the Welsh sides. Its source is in the mountains and lakes of Snowdonia National Park, Wales. Excessive nutrients (especially phosphate) are identified as a particular problem in some lower tributaries of the Dee catchment. Many of the brooks on the Wirral peninsula drain into the River Mersey to the north-east. There are designated bathing beaches at West Kirby, Meols and Moreton.

- **Regulating coastal flooding and erosion:** The coastal frontage of the Wirral peninsula is located between the River Mersey to the east and the Dee Estuary to the west, with the north Wirral coastline facing north-north-west into Liverpool Bay and the Irish Sea. A number of public and privately maintained defences act to fix the position of the shoreline in some locations. The retention of habitats such as mudflats and sand flats, coastal salt marshes and coastal sand dunes can provide a cost-effective defence against erosion/flooding.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration:** Sense of place comes both from the peninsula coastline and from the small-scale mosaic of fields and villages connected by a network of lanes lined with red sandstone houses and country estates. Feelings of inspiration and escapism, although constrained to some extent by urban development, are provided by the area's coastline of salt marshes, sand flats and coastal sand dunes, with Hilbre Island providing a particularly reflective location for those crossing to it at low tide. The area's sandstone outcrops, parkland and estates and long views over the Dee and Mersey to surrounding NCAs provide further sources of inspiration.

- **Sense of history:** The history of the landscape is evident in the area's strong links to livestock farming and fishing, with field ponds, or 'marl pits', providing a clear example. Tower mills (a type of windmill) and the remains of mills (mill mounds) are a distinctive feature of the Wirral, reflecting a thriving arable economy in the 18th and 19th centuries. The remains of early nucleated settlement and the vestiges of townfield agriculture can still be detected along the peninsula. The former port at Parkgate was a principal producer of shrimps. There is evidence of settlement in the Roman period, while some place names indicate a Norse presence in Wirral.

- **Recreation:** Recreation is important both to residents (including the large population resident in neighbouring east Wirral) and to visitors. The coastal and estuarine landscape offers opportunities for recreation associated with wildlife, such as birdwatching. Coastal areas are popular visitor destinations. Local Nature Reserves and country parks provide opportunities for people to enjoy the natural environment. Recreation is supported by the area's rights of way and cycle route network. Routes include the Wirral Way, which forms part of Wirral Country Park, the Wirral Circular Trail and National Cycle Network routes. Appropriate access can enhance visitors' experiences, increase their understanding of the local environment and lead to improvements in health and wellbeing.

- **Biodiversity:** The coastal and estuarine habitats are prime wildlife assets and are of particular biodiversity value. The Dee Estuary and North Wirral Foreshore are protected by national, European and international designations, and support extensive areas of mudflats, sand flats, coastal salt marsh and coastal and flood plain grazing marsh, with large populations of wildfowl and waders. A great number of birds, particularly waders such as curlew and pink-footed goose, rely on grass and arable farmland for feeding. Large tracts of lowland heathland occur on sandy hills in Wirral. There is also an important network of infield ponds. There are some small areas of ancient woodland, but most woodland is secondary. There are some small fragments of species-rich grassland. The rural area supports a wide range of species including bats, brown hare and barn owl.

- **Geodiversity:** The geology of the Wirral peninsula is dominated by glacial till overlying Triassic sandstone. There are a number of geological and landform features within the area, with nationally and locally recognised sites. In addition, the cliffs and coast are of geological and geomorphological importance for their sedimentary record and display of natural processes. The Triassic sandstones have historically been quarried for building stone. The pink hues of the local red stone bring warmth to the landscape and provide a unifying theme in buildings, walls and bridges, reinforcing links with the underlying geology and strengthening sense of place.

Statements of Environmental Opportunity

SEO 1: Work with natural coastal processes to conserve and enhance the dynamic estuarine and coastal landscape, with habitats such as intertidal mudflats and sand flats, coastal salt marshes and coastal sand dunes, while addressing climate change and safeguarding wildlife.

For example, by:

- Enabling natural and dynamic coastal and estuarine processes to function, so that the coastline and estuary can respond to the constantly changing patterns of accretion and erosion, allowing the formation of intertidal flats, coastal salt marshes and sand dunes to continue.
- Seeking opportunities to enhance the area's intertidal habitats, including coastal salt marsh and mudflats, to provide effective defences against wave energy and enhance their natural flood defence mechanisms.
- Monitoring and researching coastal processes to gain a deeper understanding of coastal sedimentary systems to aid the prediction of the likely effects of sea level rise, and working with partners to find ways of enabling these dynamic processes while maintaining the coast and estuary. Provide opportunities for education about coastal processes and the influence of climate change, to improve public understanding of the many features and functions of the estuary and coast.
- Protecting the distinctiveness of coast and estuary, enhancing sense of place and conserving the internationally, nationally and locally important coastal and estuarine habitats and the wildlife species they support, such as the visiting bird populations.
- Looking for opportunities to restore and create coastal habitats, such as delivering managed realignment schemes to create coastal salt marsh or other wetland habitats, to avoid any potential net loss of habitat from 'coastal squeeze' and to contribute to landscape character.
- Enabling habitats to adapt to coastal change and climate change, enabling natural movement of sand dune habitats, preventing further fragmentation and ensuring their sound management.
- Managing coastal cliffs, allowing natural processes of erosion where appropriate (including the slumping of unprotected soft cliffs around the Dee Estuary), to retain geological/geomorphological and biological interest.
- Working with the local fishing community to promote sustainable fishing practices so that fish stocks and marine ecosystems are maintained and restored.
- Working with water companies and industry to reduce the level of nutrients and other pollutants discharged into watercourses and the estuary and ensuring that sewage discharges are treated appropriately.

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SEO 1: Work with natural coastal processes to conserve and enhance the dynamic estuarine and coastal landscape, with habitats such as intertidal mudflats and sand flats, coastal salt marshes and coastal sand dunes, while addressing climate change and safeguarding wildlife.

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- Ensuring that connecting links are provided between the estuary and inland areas, maintaining migratory routes for species such as sea and river lamprey, Atlantic salmon, sea trout, smelt and eels and making sure that their passage is unobstructed by physical barriers or poor water quality.
- Maintaining and enhancing the mosaic of inland habitats such as wet grassland and coastal and flood plain grazing marsh, which is integral to supporting coastal wildlife. Maintain and enhance the mosaic of farmland in the coastal hinterland to provide for birds, including waders such as curlew and pink-footed goose.

SEO 2: Conserve and enhance the rolling countryside, punctuated by low sandstone outcrops, with significant lowland heathlands, woodlands and other wildlife habitats, while maintaining the long, open views over the coast and estuary that contribute to the varied sense of place.

For example, by:

- Maintaining and enhancing the mosaic of semi-natural habitats, including lowland heathland, grassland and wetland habitats such as coastal and flood plain grazing marshes.
- Taking opportunities to link and expand semi-natural habitats, especially wetlands and lowland heathlands, thus creating strong habitat networks, providing corridors and stepping stones that will increase resilience to climate change by reducing fragmentation and enabling species movement.
- Introducing appropriate management to sustain lowland heathland communities and to improve lowland heathland biodiversity, giving due regard to individual habitat features such as the patches of bare ground that are required by some species. Re-establish habitat links between adjacent lowland heathland sites.
- Encouraging better management of woodlands and creating new woodlands, prioritising planting to increase, buffer and link existing patches of habitat.
- Maintaining viewpoints where there are long, characteristic views, including those over the coastline, the Dee Estuary, the Clwydian Range and the Mersey; and maintaining the sense of inspiration.
- Protecting landscape features that contribute to sense of tranquillity, such as the area's coastline of coastal salt marshes, intertidal sand flats and coastal sand dunes, as well as its small areas of mixed woodland, sandstone outcrops, parkland and estates.

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SEO 2: Conserve and enhance the rolling countryside, punctuated by low sandstone outcrops, with significant lowland heathlands, woodlands and other wildlife habitats, while maintaining the long, open views over the coast and estuary that contribute to the varied sense of place.

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- Managing development around the urban fringe and within rural settlements to enhance the distinctive character and countryside setting of the rural landscape.
- Encouraging the use of appropriately designed sustainable urban drainage systems to manage water run-off at source, to help to manage flood risk and water quality and to increase biodiversity and adaptation to climate change.
- Looking for opportunities to create floodwater storage areas on the Wirral (both on and off line) in order to reduce flood risk in areas located downstream and to provide other environmental benefits such as habitats for wildlife.

Heswall Dales, an example of lowland heathland.

SEO 3: Work with landowners and land managers to support sustainable food production in the farmed environment while enhancing and strengthening the mosaic of farmland features including ponds, trees, hedgerows and red sandstone walls, to enhance biodiversity and improve soil and water quality, strengthen resilience of habitats to climate change and enhance landscape character.

For example, by:

- Encouraging sustainable food production to contribute to the economy, while delivering other benefits such as maintaining soil condition and water quality and conserving soils that sequester and store carbon.
- Managing agricultural change to protect and support the Wirral's distinctive character and wildlife habitat.
- Encouraging cultivation practices that will benefit wildlife such as farmland bird species, including restoring or creating wet grassland habitat for breeding birds and providing mosaics of overwintered stubbles, spring-sown cereals, buffer strips and extensively managed grass for year-round bird habitat.
- Protecting the area's small woodlands and copses, restoring broadleaved woodlands and ensuring that woodland is managed sustainably for multiple benefits including carbon storage and climate change adaptation.
- Seeking opportunities to incorporate hedgerow restoration and tree planting within farmland areas where they will improve ecosystem services that underpin food production; provide feeding, breeding and hibernation habitat for pollinators and beneficial predator species; provide stepping stones and corridors for wildlife; and enhance the landscape.
- Conserving and restoring boundary features such as traditional red sandstone walls and hedgerows and hedgerow trees that characterise the landscape and support biodiversity.
- Conserving and restoring the networks of infield ponds (marl pits), pond margins and pond landscapes, which are of historical and wildlife interest.
- Ensuring that horse paddocks are integrated into the agricultural landscape.
- Seeking opportunities to improve water quality in the area by working with farmers to minimise diffuse and point-source pollution, preventing agricultural nutrients and pesticides from polluting freshwater and other sources. Consider the use of buffer strips and trees to prevent sediment from polluting watercourses.
- Maintaining good soil quality and preventing soil erosion through measures such as well-timed cultivations and access onto land by machinery and stock to prevent compaction and poaching, particularly on the most vulnerable soils.

SEO 4: Safeguard and interpret Wirral's heritage, history, archaeology and geology to enhance the character of the landscape and improve people's understanding and enjoyment of the historic environment.

For example, by:

- Increasing awareness of geodiversity linking to coastal change, allowing for the interpretation of coastal geomorphological processes, to raise awareness and improve understanding of the dynamic coast and estuary.
- Deepening appreciation among landowners and the public of the links between geology, landscape, wildlife habitat and past land uses, bringing attention to their relevance to sustainable development.
- Conserving geological sites and ensuring that significant geological and landform features are sufficiently documented and protected to enable the continued study of Wirral's geodiversity.
- Providing access to sites of geological or geomorphological interest, where possible. Provide interpretation of the geology and its role in developing the character of the Wirral's landscape and further research and understanding of the area's geology.
- Where coastal processes reveal historic sites, encouraging the capture and recording of historic and archaeological information for future study.
- Protecting and restoring Scheduled Ancient Monuments and other historic and archaeological features and increasing public engagement, enjoyment and understanding of the historic environment.
- Conserving traditional farm buildings and other buildings of historic importance to ensure a better understanding of past land use and to retain evidence of the relationships between features for the future, while conserving wildlife associated with buildings, such as bats and barn owls.
- Appropriately managing the historic environment for its contribution to local character and sense of identity and as a framework for habitat restoration and sustainable development.
- Respecting local settlement patterns and building materials to avoid the loss of historic evidence in the landscape, while developing sustainable access to towns and villages for visitors, promoting Wirral's history and heritage.
- Promoting interpretation to help visitors and local people to gain an improved awareness and understanding of the key historic features within the area.
- Managing woodland parcels and pockets of ancient semi-natural woodland to safeguard historic features.

SEO 5: Enhance people's understanding and enjoyment of the natural environment, providing interpretation and educational facilities and opportunities for experiencing wildlife, with a strong network of green infrastructure, which will bring health and wellbeing benefits for both residents and visitors.

For example, by:

- Seeking opportunities to enable both residents and visitors to enjoy access to the coast and countryside and its associated recreation opportunities, by providing good facilities and interpreting the area's natural and geological heritage.
- Ensuring that tourism and leisure activities are conducted in an environmentally sustainable manner, providing interpretative and educational materials and facilities, while reducing recreational disturbance by careful management of activities, ensuring that sensitive ecosystems such as coastal sand dunes and coastal salt marshes are not negatively impacted by increased recreation and access.
- Encouraging sustainable recreational and educational access to enable more people to understand and appreciate the dynamic estuary and coastline, the landscape, the historic interest and the wildlife, while conserving the special qualities and features of these areas.
- Enhancing the rights of way and cycle route network to enable greater access for all abilities, promoting sustainable access routes that contribute to people's health and wellbeing, improve people's understanding of the area and link public footpaths and settlements.
- Supporting the development of a successful England Coast Path that encourages better public access and is sensitive to the features that are found on or along the coast. Seek to provide the best and most continuous cross-border links for pedestrians and cyclists in relation to the England Coast Path, the Welsh Coast Path and other routes.

View over West Kirby, with the Dee Estuary beyond.

Continued on next page...

SEO 5: Enhance people's understanding and enjoyment of the natural environment, providing interpretation and educational facilities and opportunities for experiencing wildlife, with a strong network of green infrastructure, which will bring health and wellbeing benefits for both residents and visitors.

Continued from previous page...

- Protecting and enhancing the quality of recreational facilities and access opportunities for users of all abilities, particularly at the coast, country parks, Local Nature Reserves, golf courses and other outdoor sports facilities, while seeking to minimise disturbance, particularly to bird populations and designated sites.
- Developing initiatives to encourage local communities to enjoy their local greenspace, to take action to improve it and to benefit from the recreation and health benefits that it affords them.
- Promoting active involvement through a wide range of volunteering opportunities and other activities to benefit habitat management and community awareness and understanding and to provide other benefits such as improving health and wellbeing, social inclusion, and learning and personal development.
- Connecting greenspaces with semi-natural habitats where possible, providing communities with recreational greenspace and wildlife corridors. Enable access in particular by people from areas where there is little public open space, such as north-east Wirral.
- Providing networks of green infrastructure, thus creating a high-quality environment to improve resilience to climate change, support biodiversity, provide recreational and educational opportunities, enhance the landscape, create local routes for walking and cycling and provide accessible natural greenspace for people close to where they live and work.
- Encouraging golf courses to manage their land sympathetically for the benefit of wildlife, spreading good practice from courses already doing so.

Supporting document 1: Key facts and data

Area of Wirral National Character Area (NCA): 16,516 ha

1. Landscape and nature conservation designations

There are no National Parks or Areas of Outstanding Natural Beauty in this NCA.

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Name	Area (ha)	% of NCA
International	Ramsar	Dee Estuary, Mersey Narrows and North Wirral Foreshore	1,338	8
European	Special Protection Area (SPA)	The Dee Estuary SPA, Mersey Narrows and North Wirral Foreshore SPA	1,338	8
	Special Area of Conservation (SAC)	Dee Estuary SAC	1,339	8
National	National Nature Reserve (NNR)	n/a	0	0
	Site of Special Scientific Interest (SSSI)	A total of 11 sites wholly or partly within the NCA	1,498	9

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 23 local sites in Wirral covering 140 ha, which is 1 per cent of the NCA.

Source: Natural England (2011)

- Details of individual Sites of Special Scientific Interest can be searched at: http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm
- Details of Local Nature Reserves (LNR) can be searched at: http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_search.asp
- Maps showing locations of Statutory sites can be found at: http://magic.Defra.gov.uk/website/magic/ – select 'Rural Designations Statutory'

1.1.1 Condition of designated sites

SSSI condition category	Area (ha)	Percentage of NCA SSSI resource
Unfavourable declining	1	<1
Favourable	1,280	85
Unfavourable no change	11	1
Unfavourable recovering	202	13

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 is a maximum of 106m above sea level at Poll Hill in Heswall. The average elevation of the landscape is 32m above sea level.

Source: Natural England 2010

2.2 Landform and process

Low-lying plain punctuated by wooded sandstone ridges and gorse-clad sandstone outcrops.

Source: Wirral Countryside Character Area Description

2.3 Bedrock geology

The geology of the Wirral peninsula is dominated by Triassic sandstone. This forms a low-lying but gently rolling platform punctuated by numerous low sandstone outcrops. The pastoral landscape of central Wirral is separated from the industrial areas of Merseyside by a dramatic sandstone ridge which extends from Bidston Hill in the north through Noctorum and Mountwood to Storeton in the south.

Source: Wirral Countryside Character Area Description

2.4 Superficial deposits

During the last glacial advance some 20,000 years ago, ice invaded from the Irish Sea area and deposited till over much of the area.

Some coastal areas such as Meols are dominated by the large-scale deposition of sand which forms extensive dune systems.

Source: Wirral Countryside Character Area Description

2.5 Designated geological sites

Tier	Designation	Number
National	Geological Site of Special Scientific Interest (SSSI)	3
National	Mixed Interest SSSI	0
Local	Local Geological Sites	9

Source: Natural England (2011)

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

2.6 Soils and Agricultural Land Classification

The core of this area is predominantly mixed agricultural land, with areas of improved pasture, arable farming and market gardens interspersed with residential development and scattered country houses with associated parkland. There are 8 main soilscape types in this NCA: slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils, covering 50 per cent of the NCA; slightly acid loamy and clayey soils with impeded drainage (16 per cent), freely draining slightly acid sandy soils (15 per cent), saltmarsh soils (7 per cent), sand dune soils (4 per cent), loamy and clayey floodplain soils with naturally high groundwater (3 per cent), naturally wet very acid sandy and loamy soils (2 per cent), and loamy and clayey soils of coastal flats with naturally high groundwater (1 per cent). Most of the agricultural land is grade 3, but there is an area of grade 5 land around Neston and Gayton Sands, as well as small areas of grade 2 agricultural land around Willaston, Neston, Hoylake and Puddington.

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

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

Grade	Area (ha)	% of NCA
Grade 1	0	0
Grade 2	1,246	8
Grade 3	9,142	55
Grade 4	423	3
Grade 5	986	6
Non-agricultural	423	3
Urban	3,792	23

Source: Natural England (2010)

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

3. Key water bodies and catchments

3.1 Major rivers/canals

There are no significant rivers running through this NCA.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 6,962 ha, 42 per cent of the NCA.

Source: Natural England (2010)

3.3 Water Framework Directive

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

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

4. Trees and woodlands

4.1 Total woodland cover

The NCA contains 856 ha of woodland (5 per cent of the total area), of which 7 ha is ancient woodland. The Mersey Forest Community Forest, one of twelve Community Forests established to demonstrate the contribution of environmental improvement to economic and social regeneration, covers part of this NCA.

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

4.2 Distribution and size of woodland and trees in the landscape

Woodland is predominantly broadleaved and is primarily associated with sandstone ridges, Country Parks and country estates.

Source: Wirral Countryside Character Area Description

4.3 Woodland types

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

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

Woodland type	Area (ha)	% of NCA
Broadleaved	783	4
Coniferous	53	<1
Mixed	37	<1
Other	28	<1

Source: Forestry Commission (2011)

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

Type	Area (ha)	% of NCA
Ancient semi-natural woodland	7	<1
Planted Ancient Woodland (PAWS)	0	0

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Most field boundaries are marked by clipped hedges, many of which are intermittent and have been replaced by post and wire fences. In coastal areas, hedges and hedgelines are often characterised by gorse scrub. Boundary features in residential areas and surrounding country estates are predominantly red sandstone walls which are a common theme running throughout the Wirral.

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

5.2 Field patterns

Field pattern is defined by intermittent hedgerows often replaced by post and wire fences with the invasion of gorse in coastal regions. Field ponds and copses are integral components of the field structure.

Source: Wirral Countryside Character Area Description; Countryside Quality Counts (2003)

6. Agriculture

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

6.1 Farm type

The farming character of this landscape is shown in the breakdown of main farm types (2009) with 59 holdings classed as 'other' (33 per cent), 34 lowland grazing livestock holdings (19 per cent), 32 dairy holdings (18 per cent), 17 cereals holdings (9 per cent), 16 horticulture holdings (9 per cent), 8 mixed holdings (4 per cent), 7 specialist poultry holdings (4 per cent) and 6 general cropping holdings (3 per cent). Survey data from 2000 to 2009 showed a decrease of 7 mixed holdings (47 per cent), 21 dairy holdings (40 per cent), 4 specialist poultry holdings (36 per cent), 8 horticulture holdings (33 per cent) and 1 lowland grazing livestock holding (3 per cent). There had been an increase in holdings classed as 'other' from less than 5 to 59.

Source: Agricultural Census, Defra (2010)

6.2 Farm size

In 2000 there were 206 holdings in this NCA. By 2009 this figure had decreased to 179 (13 per cent). Farms between 5 and 20 hectares in size were the most numerous accounting for 64 holdings (36 per cent) in 2009, followed by 34 between 50 and 100 hectares (19 per cent), 33 between 20 and 50 hectares (18 per cent), 25 below 5 hectares (14 per cent) and 23 holdings larger than 100 hectares (13 per cent). Between 2000 and 2009 the main trends were a 31 per cent decrease in holdings below 5 hectares (from 36 to 25) and a 21 per cent increase in holdings over 100 hectares (from 19 to 23).

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

In 2009 41 per cent of the total farmed area was owner occupied. There was a 56 per cent increase in the area of tenanted land between 2000 and 2009 (from 4,343 ha to 6,791 ha).

2009: total farm area = 10,764 ha; owned land = 4,445 ha
2000: total farm area = 8,750 ha; owned land = 4,390 ha

Source: Agricultural Census, Defra (2010)

6.4 Land use

The dominant land use was grass and uncropped land accounting for 6,436 hectares (60 per cent). This was followed by cereals (1,690 hectares or 16 per cent). Between 2000 and 2009 there was 7 per cent increase in the area of grass and uncropped land (from 5,992 ha to 6,436 ha).

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

Cattle were the most numerous type of livestock in Wirral (11,000). Between 2000 and 2009 there was a decrease in the number of cattle (from 11,700 to 11,000), a 29 per cent decrease in the number of sheep (from 9,500 to 6,800) and a 98 per cent decrease in the number of pigs (from 13,400 to 200).

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

Trends from 2000 to 2009 showed a decrease in the number of principal farmers from 290 to 260, a decrease in the number of salaried managers from 28 to 11, a decrease in the number of full-time workers from 127 to 92, a decrease in the number of part-time workers from 47 to 46 and a decrease in the number of casual or gang workers from 65 to 61.

Source: Agricultural Census, Defra (2010)

Please note: (i) Some of the Census data is estimated by Defra so will not be accurate for every holding (ii) Data refers to Commercial Holdings only (iii) Data includes land outside of the NCA belonging to holdings whose centre point is within the NCA listed.

7. Key habitats and species

7.1 Habitat distribution/coverage

The Wirral landscape is based upon the formal landscapes of former large country estates, rural areas, natural coastal scenery and wooded sandstone ridges which combine to give the peninsula a unique landscape character. The sandstone outcrops of this area support areas of mature woodland and extensive tracts of heathland and gorse-covered slopes. The core of this area is predominantly mixed agricultural land. Field ponds and copses are integral components of the field structure. To the north of Moreton is a low-lying, under-used remnant agricultural and horticultural area lying behind coastal embankments and partly within the floodplain of the River Birket. Further along the coast to the west the area is dominated by extensive dune systems, particularly at Meols. The Dee Estuary forms the south-western boundary of the Wirral and supports large areas of intertidal sandflats and mudflats and coastal saltmarshes.

Source: Urban Mersey Basin Natural Area Profile, Wirral Countryside Character Area Description

7.2 Priority habitats

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

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

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

Priority habitat	Area (ha)	% of NCA
Coastal and flood plain grazing marsh	469	3
Broadleaved mixed and yew woodland (broad habitat)	286	2
Lowland heathland	106	1
Coastal sand dunes	89	1
Mudflats	54	<1
Lowland meadows	35	<1
Maritime cliff and slope	13	<1
Reedbeds	9	<1
Lowland dry acid grassland	8	<1

Source: Natural England (2011)

Maps showing locations of priority habitats are available at

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

7.3 Key species and assemblages of species

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

8. Settlement and development patterns

8.1 Settlement pattern

The settlement pattern on the Wirral is a mixture of large country houses and estates, predominantly built using local red sandstones, and larger towns and villages such as Heswall, Hoylake and West Kirkby. Many towns and villages have expanded to act as dormitory settlements for the nearby urban centres of Birkenhead, Liverpool, Ellesmere Port and Chester. Settlements are linked by an intricate network of lanes, bridleways and footpaths.

Source: Wirral Countryside Character Area Description; Countryside Quality Counts (2003)

8.2 Main settlements

The main settlements within the NCA are Moreton, Upton, Neston, Greasby, Heswall, West Kirby, Irby, Hoylake, Willaston, Barnston, Saughall, Burton, Caldy and Capenhurst. The total estimated population for this NCA (derived from ONS 2001 census data) is 134,678.

Source: Wirral Countryside Character Area Description; Countryside Quality Counts (2003), Natural England (2012)

8.3 Local vernacular and building materials

The towns and villages, which have developed as dormitory settlements for workers in Birkenhead, Liverpool, Ellesmere Port and Chester, are a mixture of traditional sandstone buildings and modern post-war housing development. Increased pressure for accommodation in this commuter belt has led to the expansion of many of the settlements resulting in loss of identity and gradual coalescence. As a result, many traditional half-timbered buildings have been lost.

Source: Wirral Countryside Character Area Description; Countryside Quality Counts (2003)

9. Key historic sites and features

9.1 Origin of historic features

There is some evidence to suggest that the Wirral may have formed an ecozone for the Mesolithic communities which migrated between the uplands of the Pennines to the lowlands of the Cheshire Plain and Wirral in the winter. The north-west corner of the Wirral peninsula has a greater concentration of Scandinavian place names than elsewhere in Cheshire. However, only a few such as Meols ('sandbank') have retained their pure Scandinavian form. At the area of the Norman invasion the Wirral was an area of small villages and hamlets supporting fishing or farming communities. The key to the development of the Wirral has been the steady improvement of communications. This began in 1330 with the establishment of the original ferry across the Mersey from the Priory in Birkenhead. The increased reliability of steam-powered boats in the 1820s encouraged wealthy Liverpool businessmen and merchants to establish country houses and estates on the Wirral. The introduction of the Wirral's first railway in 1840 further encouraged settlement in the area, which has continued up to the present day. These improvements also led to the industrialisation of the Mersey coast.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 3 Registered Parks and Gardens covering 109 ha
- 0 Registered Battlefields
- 12 Scheduled Monuments
- 307 Listed Buildings

Source: Natural England (2010)

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

Farmland, with distant views of the Dee Estuary and north Wales.

10. Recreation and access

10.1 Public access

- 3 per cent of the NCA (477 ha) is classified as being publically accessible.
- There are 160km of public rights of way at a density of 1 km per km^2.
- There are no National Trails within the NCA.

Source: Natural England (2010)

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

Access designation	Area (ha)	% of NCA
National Trust (Accessible all year)	94	<1
Common Land	72	<1
Country Parks	243	2
CROW Access Land (Section 4 and 16)	146	1
CROW Section 15	123	<1
Village Greens	35	<1
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	21	<1
Local Nature Reserves (LNRs)	93	<1
Millennium Greens	0	0
Accessible National Nature Reserves (NNRs)	0	0
Agri-environment Scheme Access	0	0
Woods for People	142	<1

Sources: Natural England (2011)

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

11. Experiential qualities

11.1 Tranquillity

Based on the CPRE map of tranquillity (2006) the lowest tranquillity scores are around some of the larger towns and villages such as Moreton, West Kirby, Heswall and Neston. The highest tranquillity scores are around some of the coastal areas and in particular around the RSPB Burton Mere Wetlands nature reserve on the south west coast.

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

Category of tranquillity	Score
Highest value within NCA	26
Lowest value within NCA	-93
Mean value within NCA	-29

Source: CPRE (2006)

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

11.2 Intrusion

The 2007 Intrusion Map (CPRE) shows the extent to which rural landscapes are 'intruded on' from urban development, noise (primarily traffic noise), and other sources of visual and auditory intrusion. This shows that the areas of highest disturbance are around the larger towns and villages such as Moreton, West Kirby, Heswall and Neston. The areas of least disturbance are around some of the coastal areas and around the RSPB Burton Mere Wetlands nature reserve. A breakdown of intrusion values for this NCA is detailed in the following table.

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

Category of intrusion	1960s (%)	1990s (%)	2007 (%)	% change (1960s-2007)
Disturbed	63	69	77	14
Undisturbed	14	5	1	-13
Urban	17	18	22	5

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are a 14 per cent increase in the area of disturbed land, largely due to the expansion of urban areas.

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

Coastal sand dune system at Red Rocks, west of Hoylake.

12. Data sources

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

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

Supporting document 2: Landscape change

Recent changes

Trees and woodlands

- Between 1999 and 2003 an area equivalent to 3 per cent of the 1999 total stock was approved for new planting under a Woodland Grant Scheme agreement (13 ha). Most planting is concentrated between Bebington and Heswall.
- In 1999 about 4 per cent of the established eligible National Inventory of Woodland and Trees woodland stock was covered by a Woodland Grant Scheme management agreement. In 2003 the proportion of established, eligible National Inventory of Woodland and Trees woodland stock was about 2 per cent.
- Open areas along the M53 corridor have seen extensive tree planting supported by the Forestry Commission and Groundwork Wirral.
- There are 856 ha of woodland, although there has been 325 ha of deforestation and 292 ha of afforestation, giving a net loss of 33 ha of woodland.

Boundary features

- The estimated boundary length for the NCA is about 870 km. The total length of agreements between 1999 and 2003 is equivalent to about 2 per cent of this total. Between 1999 and 2003 Countryside Stewardship capital agreements for linear features included fencing (7 km), hedge management (4 km), hedge planting and restoration (5 km) and restored boundary protection (3 km).
- In 2011 boundaries in Environmental Stewardship were ditches (13 km) hedgerows (277 km) stone walls (1 km) and woodlands (2 km).

Agriculture

- There has been redistribution of land between 2000 and 2009, with the number of commercial holdings that are greater than 100 ha increasing from 19 to 23, while the overall number of commercial holdings has decreased from 206 to 179.
- There has been a decrease in livestock numbers between 2000 and 2009. In 2009 there were 10,998 cattle (11,745 in 2000), 6,777 sheep (9,491 in 2000) and 247 pigs (13,420 in 2000).
- The expansion of villages has resulted in loss of separate identity and gradual coalescence of settlements. There has been expansion of urban fringe into peri-urban around Hoylake and West Kirby. There has been significant development associated with the commercial sector at end of M56, and north-west of Willaston.
- A wind farm has been constructed off the northern coast of the Wirral, with an application being considered for an extension. Pressure for additional development is likely to continue.

Settlement and development

- The expansion of villages has resulted in loss of separate identity and gradual coalescence of settlements. There has been expansion of urban fringe into peri-urban around Hoylake and West Kirby. There has been significant development associated with the commercial sector at end of M56, and north-west of Willaston.
- A wind farm has been constructed off the northern coast of the Wirral, with an application being considered for an extension. Pressure for additional development is likely to continue.

Semi-natural habitat

- The Dee Estuary has accreted and coastal salt marshes have developed, particularly on the English shoreline. The total extent of coastal salt marsh in the estuary has increased from 2,103 ha in 1983 to 2,832 ha in 2000. However, locally, on the Welsh shoreline, coastal salt marsh continues to erode, particularly between Greenfield and Flint.

- In 2003, Countryside Stewardship agreements for enhancing existing lowland heathland covered 48 ha.

Historic features

- In 1918, about 2 per cent of the NCA was historic parkland. By 1995 it was estimated that 56 per cent of the 1918 area had been lost. About 28 per cent of the remaining parkland was covered by a Historic Parkland Grant.

- About 85 per cent of historic farm buildings remained unconverted. Most were intact structurally.

- Many historic field ponds, or 'pits' as they are often referred to locally, still remain as prominent features within the farmed landscape.

Coast and rivers

- The River Dee is an important source of drinking water for Wales and North West England. In 1999, the lower part of the Dee was designated as the UK's first Water Protection Zone. The Dee and its tributaries are also renowned for their excellent fishing and there is an important cockle fishery in the estuary.

- The health of the rivers, lakes, ground water and estuary in the Dee River Basin District has improved since the first river basin management plan was published in 2009. 28 per cent of water bodies were at 'good' status then and this has risen to 30 per cent in 2013[4].

- The River Dee Restoration Project has assessed the condition of the Dee and proposes improvements to enhance river habitat. It has made recommendations for measures such as removal of modifications, to restore the water body to its near natural state.

Minerals

- Wirral is not a significant source of commercial minerals, with mineral activities historically limited to small quarries for local sandstone and winnable brick clay reserves. There are small reserves of winnable clay located at Carr Lane, Moreton. The restoration of these sites will have an ongoing influence on the character of the landscape. The Carr Lane, Moreton site has planning permission to extract clay to 2042.

[4] *Dee River Basin District: Challenges and choices – Summary of significant water management issues,* Natural Resources Wales and Environment Agency (2013; URL: http://naturalresourceswales.gov.uk/content/docs/pdfs/consultation-pdfs/dee-river-basin-district-challenges-and-choices?lang=en) (2000; URL: **http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm**)

Drivers of change

Climate change

- Climate change projections indicate that the UK will experience hotter, drier summers and warmer, wetter winters. There could be an increase in the number of extreme weather events such as storm surges, intense rainfall and heat waves.

- The North West Landscape Framework Climate Change Assessment assessed the exposure of this area and its natural assets to the impacts of climate change and its capacity to adapt[5]. The low variation in topography across Wirral and gently undulating agricultural landscape make the area less likely to cope with climate change. Reduced summer rainfall could increase the drying of clay soils, leading to cracking and water stress, with consequential changes in agricultural practices to adapt to the changes.

- Large tracts of lowland heathland occur on sandy hills in Wirral. Lowland heathland is sensitive to longer growing season, drought, and increased run-off, leading to changes in community composition, loss of bare ground areas, more heather beetle attacks, and increase in wildfires, which can destroy the seed bank. It is also vulnerable to competition from increased bracken growth due to warmer winters and a longer growing season. Lowland heathland regenerates but capacity depends on extent and nature of impact and soil conditions.

- Sea level rise and coastal inundation due to storm events could affect the intertidal landscapes, particularly where they lie in front of coastal defences. Coastal salt marshes and intertidal mudflats (estuaries) are sensitive to tidal flooding as a result of rising sea levels and increased wave energy from storm surges. Coastal salt marsh is likely to experience coastal squeeze when it is trapped between rising sea levels and fixed defences, reducing adaptive capacity. They may also be sensitive to accelerated erosion of seaward marsh edge. This could result in loss of base of estuarine food webs and the loss of loafing and roosting sites for key bird species. Changes in internal creek patterns could affect internal erosion and sediment transport within the coastal salt marsh.

- Coastal and flood plain grazing marsh is sensitive to flooding and inundation by the sea and saline intrusion leading to loss of fresh water marsh species. These habitats are sensitive to periods of drought leading to drying out and loss of habitat for breeding and feeding for wetland birds. Unpredictable inundation of coastal and flood plain grazing marsh with increased silt loading could lead to loss of botanical diversity if floods occur at different times of the year.

- Coastal sand dunes are sensitive to erosion caused by sea level rise and increased wave energy leading to beach lowering. Change in shoreline position and dune system will impact on sand stability, dune mobility and groundwater levels affecting ecology.

- Maritime cliffs and slopes are sensitive to erosion caused by increased rainfall which could result in more vertical slopes and more rapid retreat of coastal soft cliffs.

[5] *North West Landscape Framework – Climate Change Assessment – 2010/11,* Natural England (URL: www.naturalengland.org.uk/regions/north_west/ourwork/climatechangeassessment.aspx)

Other key drivers

- The area faces challenges to accommodate future growth and new development, including reconciling economic development with the imperative of protecting its coastal distinctiveness and internationally important habitats.
- There may be opportunities to develop wind, marine, solar and other renewable energy technologies, for example tidal and wind power. However, the Wirral coastline's wildlife and habitats are of international importance and sensitive to development.
- The coastline of this NCA is generally accreting, but at some unknown point rising sea levels are likely to alter this.
- The network of green infrastructure provides opportunities for multifunctional green spaces, with multiple social, economic and environmental benefits. Green spaces can be managed in an integrated way that enhances the biodiversity, functionality, quality, connectivity and accessibility of the spaces. The Green Infrastructure Framework for North East Wales, Cheshire and the Wirral[6] and Liverpool City Region Green Infrastructure Framework[7] set out how a healthy natural environment can help sustain economic growth and thriving communities. Liverpool City Region Ecological Framework has been established and aims to reduce the loss of and/or fragmentation of important habitats[8].
- Work has started on the England Coast Path, a new national trail around England's open coast. This will enable rights of access along the coast and – where appropriate – 'spreading room'. The trail will have an important future role for local recreation and tourism opportunities.
- Ease of transport and improved communication technology have fuelled the desire to live in the countryside and the inland landscape with its mosaic of formal parkland, rural farmland and small villages is under pressure for expansion of existing settlement, ribbon development and in-fill expansion of villages, resulting in a loss of separate identity and gradual coalescence of urban areas.
- Pressure from urban fringe development may include demand for recreation facilities such as equestrian riding schools (including enclosed exercise areas and associated large-scale buildings, horse grazing with associated changes to field boundaries and the use of informal animal shelters and sheds).
- Changes in farming including diversification and changing patterns of land ownership. The purchase of agricultural holdings by non-farmers is a force for change, resulting in conversion of farm houses and farm buildings and changes in farm use. Changes in farm crops are possible, with an increase in areas under arable or fodder crops, a trend towards silage production, and possible moves towards biomass crops such as miscanthus.
- The Mersey Forest Plan[9] covers part of this NCA, as well as a wider area and may direct change.
- There may be risks posed by tree pests and diseases such as Chalara die-back of ash, which may impact upon wildlife, environmental quality and landscape.

[6] *Green Infrastructure Framework for North East Wales, Cheshire and Wirral,* Mersey Dee Alliance (2011; URL: **www.merseydeealliance.org.uk/green-infrastructure/**)

[7] *Liverpool City Region and Warrington Green Infrastructure Framework Action Plan.* The Mersey Forest (December 2013; URL: **www.merseyforest.org.uk/our-work/green-infrastructure/liverpool-city-region-green-infrastructure-framework/**)

[8] Liverpool City Region Ecological Framework (URL: **http://seftonmaps.sefton.gov.uk/EcoFramework/**)

[9] *Mersey Forest Plan*, The Mersey Forest (2014; URL: www.merseyforest.org.uk/plan/)

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.

Leasowe Lighthouse, the North Wirral Coastal Park.

Statement of Environmental Opportunity	Ecosystem Service: Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity
SEO 1: Work with natural coastal processes to conserve and enhance the dynamic estuarine and coastal landscape, with habitats such as intertidal mudflats and sand flats, coastal salt marshes and coastal sand dunes, while addressing climate change and safeguarding wildlife.	↗ *	↔ ***	↔ **	↔ **	↔ ***	↗ **	↗ **	↗ **	↗ **	↗ ***	↔ *	↔ *	↑ **	↑ ***	↗ **	↗ **	↑ **	↑ ***	↑ ***
SEO 2: Conserve and enhance the rolling countryside, punctuated by low sandstone outcrops, with significant lowland heathlands, woodlands and other wildlife habitats, while maintaining the long, open views over the coast and estuary that contribute to the varied sense of place.	↔ **	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↔ **	↗ ***	↔ **	↗ ***	↗ **	↑ ***	↗ **
SEO 3: Work with landowners and land managers to support sustainable food production in the farmed environment while enhancing and strengthening the mosaic of farmland features including ponds, trees, hedgerows and red sandstone walls, to enhance biodiversity and improve soil and water quality, strengthen resilience of habitats to climate change and enhance landscape character.	↑ **	↗ **	↗ **	↔ **	↔ **	↗ **	↗ **	↗ **	↑ ***	↑ ***	↗ **	↗ **	↔ **	↗ **	↔ **	↗ **	↔ **	↗ **	↗ **

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

Dark plum = National Importance; Mid plum = Regional Importance; Light plum = Local Importance

Statement of Environmental Opportunity	Ecosystem Service																		
	Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place/inspiration	Sense of history	Tranquility	Recreation	Biodiversity	Geodiversity
SEO 4: Safeguard and interpret Wirral's heritage, history, archaeology and geology to enhance the character of the landscape and improve people's understanding and enjoyment of the historic environment.	↔ **	↔ **	↔ **	↔ **	↔ ***	↔ **	↔ **	↔ **	↔ **	↗ **	↔ **	↔ **	↗ **	↑ ***	↑ ***	↗ **	↗ **	↗ **	↑ ***
SEO 5: Enhance people's understanding and enjoyment of the natural environment, providing interpretation and educational facilities and opportunities for experiencing wildlife, with a strong network of green infrastructure, which will bring health and wellbeing benefits for both residents and visitors.	↔ **	↗ **	↔ **	↔ **	↔ **	↗ **	↗ **	↗ **	↗ **	↗ **	↔ **	↔ **	↔ **	↑ ***	↗ ***	↑ **	↑ ***	↗ **	↗ **

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

Dark plum = National Importance; Mid plum = Regional Importance; Light plum = Local Importance

Landscape attributes

Landscape attribute	Justification for selection
Low-lying but gently rolling platform punctuated by low sandstone outcrops. This western portion of the Wirral peninsula stretches from the mid-Wirral sandstone ridge to the Dee Estuary.	■ The area's landform comprises a low-lying peninsula, defined by the Mersey and Dee estuaries, which slopes gently from a dramatic sandstone ridge. ■ The ridge separates the area from the industrial and residential development of the Merseyside Conurbation to the east.
Geology is dominated by glacial till overlying Triassic red mudstones and sandstones, with sandstone ridges and outcrops.	■ The harder coarse red Triassic sandstone reaches the surface to create ridges and outcrops in many parts of Wirral, providing long views over the estuaries and lower areas of farmland. ■ Rock outcrops such as Red Rocks, Hilbre Island, Middle Eye and Little Eye are distinctive features of the coast. ■ The eastern shore of the Dee Estuary is backed by a stretch of till cliffs. Natural coastal erosion is prevalent on the soft cliffs and the presence of slumped material is common. Soft cliffs supply sedimentary material and therefore perform an important coastal processes role.
The north Wirral coast is characterised by extensive beaches along the foreshore; while the large funnel shaped Dee Estuary lies between the Wirral peninsula and north-east Wales.	■ A dynamic landscape affected by the movements of the sea. ■ The Dee Estuary is a commercial waterway providing access to the Port of Mostyn, to Shotton and to Connah's Quay. ■ In addition to the large areas of intertidal sand flats, mudflats and coastal salt marsh, the Dee also includes the islands of Hilbre; three small low lying sandstone islands located approximately 1 km off the extreme north-west corner of the Wirral peninsula. ■ Long distance panoramic views extend across the vast expanse of the Dee Estuary towards the far shores. At low tides the full extent of the mud flats and channels is visible from a few locations but most vantage points provide views over a green expanse of coastal salt marsh with open water a considerable distance beyond. ■ The sea wall at Parkgate delineates the former coast line before the rapid silting of the Dee Estuary following the canalisation of the River Dee in the 18th century.

Landscape attribute	Justification for selection
Drainage is into the Dee Estuary in the west and the Mersey Estuary in the east, with a network of small streams and drainage ditches.	■ The south-western part of the NCA contains streams draining to the Dee Estuary. ■ Most small rivers in the north of the peninsula drain into the Birket which itself flows into the River Mersey via Wallasey Pool (Birkenhead Docks), while Clatter Brook and the River Dibbin drain into the Mersey at Bromborough Pool. ■ Drainage ditches are present along many field boundaries.
Predominantly broadleaved woodland, with woodland cover on sandstone ridges, country parks and country estates.	■ Woodland cover is relatively low at 856 ha (5 per cent of the NCA). ■ Woodland includes mature pines, particularly in coastal regions. ■ Woodland concentrated on the outcrops, ridges and in country estates and country parks forming prominent landscape features. ■ Pockets of woodland often create the impression of considerable woodland being present.
Formal landscape created by former, large country estates and mixed agricultural land, with areas of improved pasture, arable farming, market gardens and extensive areas given over to grazing horses.	■ A mosaic of former large country estates, parks and mixed farmland, with areas of improved pasture, arable farming, market gardening and growth of nursery stock. ■ Horse paddocks are also a dominant land use.
Fields defined by intermittent clipped hedgerows with copses and some red sandstone walls and field ponds 'marl pits'; coastal areas often with a geometric field pattern bounded by ditches draining former marshlands.	■ Fields are medium in size, bounded by intermittent flailed hedgerows that are often replaced by post and wire fencing. ■ In coastal areas fields are either bounded by ditches draining former marshland or hedges characterised by gorse scrub. ■ Smaller-scale, but important, landscape features include copses and field ponds. ■ The practice of marling resulted in many pits or ponds in farmed areas.

Landscape attribute	Justification for selection
A significant coast and estuary with internationally, nationally and locally recognised wildlife and habitats while inland extensive areas of lowland heathland are associated with sandstone outcrops.	■ The coastal strip along the Dee Estuary and north Wirral foreshore is characterised by extensive internationally important areas of intertidal sand flats, mudflats and coastal salt marshes with internationally important populations of wildfowl and waders. These areas include parts of the Dee Estuary Special Area of Conservation, Special Protection Area and Ramsar site, and the Mersey Narrows and North Wirral Foreshore Special Protection Area and Ramsar site. ■ Relic fragments of coastal sand dunes, including Red Rocks Site of Special Scientific Interest (SSSI), which provides habitat for a population of natterjack toad. ■ Inland, large tracts of lowland heathland occur on sandy hills in Wirral, such as at Heswall Dales SSSI and Thurstaston Common SSSI. The silver-studded blue butterfly has been re-introduced to lowland heathland in Wirral as a conservation measure.
The rural landscape, with country estates, scattered farms and mix of ancient and post-medieval fieldscapes, is interspersed with residential commuter belt development, with towns and villages coalescing due to suburban development linked by an intricate network of lanes, bridleways and footpaths.	■ Many towns and villages have expanded to act as dormitory settlements for the nearby urban centres of Birkenhead, Liverpool, Ellesmere Port and Chester. ■ Settlements are typically linked by an intricate network of lanes, bridleways and footpaths.
Red sandstone is common throughout the area; the pink hues of the local red stone bring warmth to the landscape and provide a unifying theme in buildings, walls bridges and churches.	■ Many traditional buildings are of local red sandstone, reflecting the underlying geology, with some older structures in half timber. ■ Boundaries of red sandstone walls are a common theme running throughout the Wirral.

Landscape attribute	Justification for selection
Recreation and tourism supported by good access to the dramatic coastal landscape and outstanding ornithological interest, with a number of accessible green spaces.	■ Wirral provides access to recreational resources for the adjacent Merseyside Conurbation and Mersey Valley populations. ■ The Dee Estuary is an important recreational area. ■ Country parks such as Wirral Country Park, Local Nature Reserves, including Hilbre Islands, and 23 Local Wildlife Sites. ■ National Trust land. ■ RSPB Burton Mere Wetlands nature reserve on the south-west coast. ■ There are a large number of golf courses along the coastal strip and in rural areas. Some golf courses include good habitat for wildlife.

Landscape opportunities

- Conserve and enhance coastal and estuarine habitats, allowing the role of natural coastal processes to be maintained.
- Conserve and enhance coastal salt marsh habitats.
- Manage the coastal sand dune systems to prevent further fragmentation and ensure coastal sand dune habitats are maintained and enhanced.
- Conserve, enhance and restore lowland heathland as a characteristic element in the landscape; woodland regeneration has occurred on some areas of former lowland heathland. Consider clearance and restoration of lowland heathland habitats in appropriate locations on these sites.
- Protect and manage the area's small woodlands and copses, restoring broadleaved woodlands.
- Increase tree cover in appropriate locations to provide multiple benefits including enhancing the landscape, helping improve water quality, adapting to climate change and reconnecting habitats.
- Manage and restore the significant network of hedgerows and hedgerow trees, improving hedgerow condition, to enhance the landscape as well as providing habitat corridors for wildlife.
- Retain and enhance the network of sandstone wall field boundaries for their visual and historic qualities.
- Conserve and enhance the network of infield ponds ('marl pits'), pond margins and pond landscapes.

Continued on next page...

Coastal saltmarsh accretion in the Dee Estuary, shown here by the sea wall at Parkgate.

Landscape opportunities continued...

- Ensure that horse paddocks are integrated into the agricultural landscape.
- Maintain or restore semi-natural grasslands, lowland meadow, acid grassland and other semi-natural and species-rich grassland.
- Increase habitat for farmland birds, providing mosaics of overwintered stubbles, spring sown cereals, buffer strips and extensively managed grass for year round bird habitat and maintain or restore wet grassland habitat for breeding birds.
- Maintain and enhance the sense of tranquillity and locally important views of the coast and countryside.
- Carefully integrate residential commuter settlement expansion to retain the contextual associations with the rural landscape setting.
- Provide networks of green infrastructure, creating a high-quality environment to support biodiversity, provide recreational and educational opportunities, enhance the landscape, create local routes for walking and cycling and provide accessible natural green spaces for people close to where they live and work.
- Manage and enhance historic parkland landscapes, and restore the structure and character of designed landscapes.
- Support the England Coast Path to ensure that sensitive features are not negatively impacted. Where possible incorporate better public access provision in the future.

Ecosystem service analysis

The following section shows the analysis used to determine key ecosystem service opportunities within the area. These opportunities have been combined with the analysis of landscape opportunities to create Statements of Environmental Opportunity.

Please note that the following analysis is based upon available data and current understanding of ecosystem services. It does not represent a comprehensive local assessment. Quality and quantity of data for each service is variable locally and many of the services listed are not yet fully researched or understood. Therefore the analysis and opportunities may change upon publication of further evidence and better understanding of the inter-relationship between services at a local level.

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision	Mixed agricultural land Soils Estuary Fisheries	In 2009 the total farm area was 10,764 ha. The dominant land use is grass and uncropped land accounting for 6,436 ha (60 per cent). This is followed by cereals (1,690 ha or 16 per cent). In 2009, 33 per cent of holdings were classed as 'other types' which includes holdings with only horses, with only grass or fodder crops or with only fallow land or buildings and holdings with unknown activity. This may be indicative of a high level of farm diversification. Livestock numbers in 2009 were cattle (10,998), sheep (6,777) and pigs (247). **Continued on next page...**	Regional	Most farming is grass and uncropped land, with cattle being the most prominent livestock, followed by sheep. There are also pockets of arable land and market gardening. However, grazing by horses is also a major component of the landscape, reducing availability of land for agriculture. Depending on soil types, warmer temperatures and reduced rainfall could lead to greater intensification and a move towards arable crops and root crops, which may lead to increased water demand and greater use of irrigation systems. Temperature changes could affect the timing of planting and harvesting crops, for example, root crops may be left in the ground for longer. The mosaic of both grassland and arable farmland is used by farmland birds and by waders for feeding. Important commercial shellfish beds are found on the Dee Estuary. The cockle fishery is regulated by the Environment Agency.	Manage agricultural change to protect and support the landscape's distinctive character and wildlife habitat. Support initiatives to develop mixed agricultural systems which are economically and environmentally sustainable. Ensure that horse paddocks are integrated into the agricultural landscape. Provide mosaics of overwintered stubbles, spring sown cereals, buffer strips and extensively managed grass for year round bird habitat. Conserve network of infield ponds, pond margins and pond landscapes.	**Food provision** **Regulating soil quality** **Regulating soil erosion** **Pollination** **Sense of place/ inspiration** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision cont.		**... continued from previous page** The Dee Estuary supports commercial fishing including an important cockle fishery. Common or brown shrimp are caught in the shallow waters of the mouth of the Dee Estuary. The Dee has been designated a 'bass-nursery area'.		Cockle harvesting is licensed, with allocation of licences for cockling determined by rules in the Dee Cockle Regulating Order. Most landing occurs on the more accessible English side of the estuary. Bass fishing is also restricted within the estuary.	Prevent agricultural nutrients and pesticides from polluting fresh water and other sources. Sustainable management of the fisheries.	
Timber provision	Woodland The Mersey Forest	Woodland cover is relatively low at 856 ha (5 per cent). This includes 738 ha of broadleaf woodland, 53 ha of conifer woodland and 37 ha of mixed woodland. Ancient semi-natural woodland covers 7 ha. The Mersey Forest covers approximately half of the NCA.	Local	Woodland cover is limited within this NCA. New woodland planting would increase opportunities for timber provision, however, planting would need to be sensitively carried out to maintain biodiversity and minimise conflict with food production. Woodland planting is likely to be inappropriate around the mudflats and coastal salt marshes of the Dee Estuary, with the open nature of the designated area. There may be some opportunities to create small woodlands, for example, to buffer riparian zones in farmland and around appropriate urban and settlements such as playing fields, highway verges and derelict land. **Continued on next page...**	Seek opportunities for woodland planting in suitable locations such as to buffer riparian zones in farmland and around appropriate urban areas and settlements such as playing fields, highway verges and derelict land. Encourage appropriate management of woodlands and the creation of new woodlands, prioritising planting to increase, buffer and link existing patches of habitat to provide multiple benefits including timber provision, sustainable wood products, wildlife conservation and recreation.	**Timber provision** **Water availability** **Biomass energy** **Climate regulation** **Regulating water quality** **Tranquillity** **Recreation** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision cont.				**... continued from previous page** There may also be opportunities to create new multi-purpose woodlands for the development of recreational links or the establishment of nature conservation areas. Approximately half of the area is within the Mersey Forest, which has objectives to create sustainably managed community woodlands that benefit the education and health and wellbeing of communities and through the provision of woodland products. Woodland regeneration has occurred on areas of former lowland heathland; consider woodland clearance and restoration of lowland heathland habitats in appropriate locations where this would contribute to biodiversity.	Seek opportunities to incorporate tree planting within farmland areas where it will improve ecosystem services underpinning food production. Management of woodland/ scrub regeneration on areas of former lowland heathland in appropriate locations to improve lowland heathland biodiversity.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability	Rivers and streams Sandstone aquifer Rainfall	The NCA overlays groundwater management units (GWMUs) consisting of major sandstone aquifers, with groundwater abstractions used for public water supply in the Mersey catchment. These have 'restricted water available'. The only surface water resource within the NCA is Dibbinsdale Brook, which drains to the Mersey Estuary and is classed as having 'water available'. [10] The availability of surface water for abstraction in the area around the Dee Estuary has not been assessed in detail, however it is likely some surface water is available. There is no groundwater available. [11]	Regional	The geology of the area is dominated by sandstones that are part of the Permo-Triassic sandstone aquifer. This important aquifer is used for public water supply, industrial and agricultural use. The reason for the groundwater status 'restricted water available' in Wirral groundwater management units is saline intrusion, while the North West Wirral ground water unit is also over licensed. Due to a long history of heavy groundwater abstraction along the coast, saline intrusion from the Mersey Estuary is a major issue.	Promote the wise and efficient use of water. Ensure that abstraction from water resources is sustainable. Conserve groundwater to prevent further saline intrusion. Encourage new developments to incorporate permeable ground surfaces, sustainable urban drainage systems, water efficiency features and rainwater/grey water harvesting.	**Water availability** **Regulating water quality** **Regulating water flow** **Biodiversity**

[10] Lower Mersey and Alt Abstraction Licensing Strategy, Environment Agency (2013; URL: www.environment-agency.gov.uk/business/topics/water/119935.aspx)
[11] Dee Catchment Abstraction Licensing Strategy, Environment Agency Wales (2013; URL: www.environment-agency.gov.uk/business/topics/water/119933.aspx)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Genetic diversity	Black poplar	The native black poplar is a rare tree with representation in the Wirral NCA. Specimens can be found at Hallwood Farm Marl Pit Site of Special Scientific Interest (SSSI).	Local	Historically the black poplar has been much used in hybridisation or propagated to produce, among others, the Manchester poplar, which was widely planted for its tolerance of air pollution. The true native species, a plant of lowland flood plains, has declined through progressive clearance of habitat and surviving specimens are often isolated. Little or no seed is produced once the distance between remaining individual male and female black poplars has become too great. Hallwood Farm Marl Pit SSSI contains one male and two female trees growing in close proximity which ensures a supply of fertile seed.	Consider a strategy for maintaining and increasing the population of native black poplar.	**Genetic diversity** **Climate regulation** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biomass energy	Farmland Woodland The Mersey Forest	In this NCA the existing woodland cover (5 per cent) offers low potential for the provision of biomass, either through bringing unmanaged woodland under management or as a by-product of commercial timber production. The NCA has a predominantly medium potential yield for short rotation coppice, with some areas of low potential, while the potential miscanthus yield is predominantly high. For information on the potential landscape impacts of biomass plantings within the NCA, refer to the tables on the Natural England website. [12] There are eight wood fuel boilers and one wood fuel supplier.	Local	The Wirral has a unique character being a peninsula, with outward views from coast and sandstone ridges. Its physical characteristics lend themselves to limited biomass crop planting in low-lying areas. However, the countryside is small scale, highly valued by urban population and at the same time vulnerable to urban pressures and in practice, opportunities for planting without adverse impact in some respect, may be very limited. Woodland regeneration has occurred on areas of former lowland heathland. Clearance and restoration of lowland heathland habitats in appropriate locations on these sites may provide small-scale opportunities for biomass. There may be some opportunities to create small woodlands, for example, to buffer riparian zones in farmland and around appropriate urban and industrial areas and settlements such as playing fields, highway verges and derelict land. There may also be opportunities to create new multi-purpose woodlands for the development of recreational links or the establishment of nature conservation areas. Community woodland partnerships, such as the Mersey Forest, are beginning to establish sustainable supply and demand for biomass.	Encourage better management of woodlands and the creation of new woodlands, prioritising planting to increase, buffer and link existing patches of habitat. Explore opportunities for management of woodlands and scrub to produce surplus timber and biomass for local use, such as wood-fired boilers. Seek opportunities to incorporate tree planting within farmland areas where it will improve ecosystem services underpinning food production. Managing woodland/scrub regeneration on areas of former lowland heathland in appropriate locations may provide some biomass, while improving lowland heathland biodiversity.	**Biomass energy** **Timber provision** **Climate regulation** **Biodiversity**

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

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation	Soils Semi-natural habitats	In this NCA soil carbon levels are generally low, reflecting that 81 per cent of its area is covered by mineral soils which can be low in organic matter. The area's remaining soils, are: ■ Salt marsh soils, 7 per cent of NCA. ■ Sand dune soils, 4 per cent of NCA. ■ Naturally wet very acid sandy and loamy soils 2 per cent of NCA. ■ Loamy and clayey flood plain soils with naturally high groundwater, 3 per cent of NCA. ■ Loamy and clayey soils of coastal flats with naturally high groundwater, 1 per cent of NCA. Carbon storage is also provided to a limited extent by the area's woodland cover (5 per cent of the NCA).	Local	The salt marsh soils, sand dune soils, naturally wet very acid sandy and loamy soils, loamy and clayey flood plain soils with naturally high groundwater and loamy and clayey soils of coastal flats with naturally high groundwater are all likely to have organic-rich or peaty layers and can provide an important store of carbon. It is thus important to conserve these soils, especially where associated with areas of coastal and flood plain grazing marsh, lowland heathland and the Dee estuary's intertidal mud and silts. Any climatic changes that put soils under stress will impact on carbon storage potential. A switch from livestock to arable production will increase soil disturbance and will impact on carbon stores. Carbon storage is also provided to a limited extent by the area's woodland cover, especially where brought under sustainable management.	Seek opportunities to restore and expand semi-natural habitats such as coastal and flood plain grazing marsh and wetland and grassland habitats and bring them under sympathetic management to increase carbon storage. Work with the farming community to ensure best practice in soil management, adopting cultivation practices that retain the organic content of soils, thereby facilitating carbon retention as well as reducing soil erosion.	**Climate regulation** **Regulating soil quality** **Regulating soil erosion** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Rivers and streams Sandstone aquifer Rainfall Semi-natural habitats	Nitrate vulnerable zone is 6,962 ha, 42 per cent of the NCA. The Tidal Dee catchment covers streams and rivers that flow directly to the Dee Estuary on both the English and Welsh sides. In 2012, 30 per cent of surface waters in the Dee River Basin District were at good ecological status/potential or better. In 2009, 83 per cent of groundwater bodies were at good quantitative status and good chemical status. Transitional waters (for example, estuaries and saline lagoons) in the Dee River Basin District did not meet good ecological status/potential in either 2009 or 2012. [13] Many of the brooks on the Wirral peninsula drain into the River Mersey to the north east. In the Mersey Estuary Catchment, 66 per cent of water bodies are at moderate quality, 25 per cent poor and 3 per cent are bad. [14] **Continued on next page...**	Regional	The Dee River Basin District covers an area of 2,251 km^2, mainly in Wales but including a small area in England. Its source is in the mountains and lakes of the Snowdonia National Park. Chester and Wrexham are the major urban centres, but the land is mainly rural with rough grazing and forestry in the upper catchment and arable and dairy farming on the Cheshire Plain. The main reasons why water bodies in the Dee River Basin District are not in a good condition relate to issues such as physical modifications and diffuse pollution from rural areas. [15] Excessive nutrients (especially phosphate) are identified as a particular problem in some lower tributaries of the Dee catchment, due to a combination of agricultural land practices associated with cattle farming and waste water discharges.	Work with landowners and managers on water quality issues that have been identified. Possible approaches include fencing riverside zones to exclude livestock from rivers and capture diffuse sediment and nutrient pollution; adjusting numbers of livestock to reduce field erosion; promoting the use of cover crops to reduce erosion and retain soil nutrients; identifying and improving farmyard infrastructure (improving slurry storage, separating 'clean' and 'dirty' water); developing nutrient management plans that save money and protect the environment; and reducing reliance on chemical fertilisers, pesticides and herbicides.	**Regulating water quality** **Food provision** **Water availability** **Regulating water flow** **Recreation** **Biodiversity**

[13] *Dee River Basin District: Challenges and choices – Summary of significant water management issues,* Natural Resources Wales and Environment Agency (2013; URL: http://naturalresourceswales.gov.uk/content/docs/pdfs/consultation-pdfs/dee-river-basin-district-challenges-and-choices?lang=en)

[14] *North West River Basin District: Challenges and choices*, Environment Agency (2013)

[15] *Dee River Basin District: Challenges and choices – Facts and statistics*, Natural Resources Wales (June 2013)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality cont.		**... continued from previous page** There are designated bathing beaches at West Kirby, Meols and Moreton.		Use of buffer strips or tree planting in appropriate locations along watercourses and in the wider catchment could help to reduce diffuse pollution and sedimentation. Cockle gathering in the Dee estuary is susceptible to contamination from wastewater treatment discharges. Water quality at a bathing water is dependent upon the type and area of land (the catchment) draining to the water and the activities undertaken in that catchment. Bathing water quality is sampled by the Environment Agency and is generally meeting or exceeding minimum standards.	Manage and extend areas of permanent grassland, scrub and woodland along watercourses where appropriate. Work with water companies to reduce the level of nutrients and other pollutants discharged into watercourses and ensure sewage discharges are treated appropriately.	

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Rivers and streams Coast Estuary Rainfall Semi-natural habitats	This NCA is bounded to the north by Liverpool Bay and to the west by the Dee Estuary. Its north-eastern part contains some tributary streams that drain to the Mersey Estuary, including the River Birket, which creates some flood risk at Hoylake within the NCA. The south-western part of the NCA contains streams draining to the Dee estuary, but these do not give rise to significant fluvial flood risk. Tidal flood risk is covered below under 'Regulating coastal erosion and flooding'.	Local	Wetter winters and more severe storm events are likely to lead to increased surface water. This may be of particular concern in communities such as Holywell and Neston where such flooding is already an issue. [16] Tidal levels can restrict the outflows from watercourses and drainage systems and exacerbate flooding behind defences. Storing water or managing run-off can provide overall flood risk reduction or environmental benefits, locally or elsewhere in the catchment. This supports sustainability by reducing the risk from flooding to people and property, and in turn transferring the risk to locations where it can be beneficial. There are opportunities to create storage areas on the Wirral (both on and off line) in order to reduce flood risk in areas located downstream. Sustainable land management practices can reduce the amount and rate of run-off and erosion.	Encourage the use of appropriately designed sustainable urban drainage systems (SUDS) to control run-off at source. Look for opportunities to create flood water storage areas on the Wirral (both on and off line) in order to reduce flood risk in areas located downstream and provide other environmental benefits such as habitats for wildlife. Encourage good management of agricultural soils to improve water infiltration rates, slow run-off and increase water-holding capacity. Seek opportunities to restore and extend semi-natural habitats such as flood plain grassland and woodland to improve water storage capacity and infiltration and slow run-off while improving habitat networks and ecosystem resilience to climate change. Encourage tree planting in appropriate locations and hedgerow restoration to help slow run-off into rivers.	**Regulating water flow** **Water availability** **Regulating water quality** **Regulating soil quality** **Biodiversity**

[16] *River Dee Catchment Flood Management Plan,* Environment Agency Wales (2010; URL: http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/gewa011obrko-e-e.pdf)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil quality	Soils Semi-natural habitats	There are eight main soilscape types in this NCA: ■ Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils, covering 50 per cent of the NCA. ■ Slightly acid loamy and clayey soils with impeded drainage (16 per cent). ■ Freely draining slightly acid sandy soils (15 per cent). ■ Salt marsh soils (7 per cent). ■ Sand dune soils (4 per cent). ■ Loamy and clayey flood plain soils with naturally high groundwater (3 per cent). ■ Naturally wet very acid sandy and loamy soils (2 per cent). ■ Loamy and clayey soils of coastal flats with naturally high groundwater (1 per cent).	Local	The slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils may suffer compaction and/or capping as they are easily damaged when wet. 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. Similarly, the slightly acid loamy and clayey soils with impeded drainage have a weak topsoil structure that can easily be poached by livestock and compacted by machinery when wet. Careful timing of activities is required to reduce this likelihood. The freely draining slightly acid sandy soils allow water infiltration and have potential for increased organic matter levels through management interventions. They may be valuable for aquifer recharge, requiring the maintenance of good structural conditions to aid water infiltration and requiring the matching of nutrients to needs to prevent pollution of the underlying aquifer.	Work with the farming community to ensure best practice in soil management to improve structure and quality of soils. This may be achieved through actions such as using low pressure machinery and managing stock movements, where necessary fencing watercourses and providing drinking bays to prevent bankside erosion from livestock access.	**Regulating soil quality** **Food provision** **Regulating water quality** **Regulating water flow** **Regulating soil erosion**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Soils Semi-natural habitats Geomorphological processes	There are eight main soilscape types in this NCA: The slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (50 per cent of the NCA), loamy and clayey flood plain soils with naturally high groundwater (3 per cent), and loamy and clayey soils of coastal flats with naturally high groundwater (1 per cent) are of low risk of erosion. Soils at risk or erosion include slightly acid loamy and clayey soils with impeded drainage (16 per cent); freely draining slightly acid sandy soils (15 per cent); salt marsh soils (7 per cent); sand dune soils (4 per cent); and naturally wet very acid sandy and loamy soils (2 per cent).	Local	Slightly acid loamy and clayey soils with impeded drainage are prone to capping/slaking, leading to increased risk of erosion. These soils are easily compacted by machinery or livestock if accessed when wet, increasing risks of water erosion. This is particularly an issue on the steeper land. Freely draining slightly acid sandy soils are of enhanced risk of soil erosion especially on moderately or steeply sloping land where cultivated or bare soil is exposed. This is exacerbated where organic matter levels are low after continuous arable cultivation or where soils are compacted. There is also potential for wind erosion where these soils are cultivated or left bare especially in spring. Factors affecting soil erosion are complex. The location of habitats and other land cover has an impact on the management of soil erosion. Measures may be beneficial where they retain water in situ, ensure good vegetative cover and avoid over-grazing/ trampling or damage by mechanised activities. **Continued on next page...**	Maintain good soil structural condition through well-timed cultivations and access onto land by machinery and stock to prevent compaction and poaching. Consider use of buffer strips to prevent sediment polluting watercourses or impacting on adjoining land, particularly on the most vulnerable soils. Encourage opportunities to manage and extend habitats including woodland and riparian habitats in appropriate locations, such as near watercourses to prevent or capture sediment run-off and improve infiltration. Take measures to keep soil in-situ, such as contour ploughing where sloping. Where soils are eroding land use change may be necessary (for example, from arable to grass). Ensure good vegetative cover, avoiding over grazing/ trampling or damage from mechanised activities. On the most vulnerable soils consider use of windbreaks, rough seedbeds, nurse crops and planted straw to reduce wind erosion.	**Regulating soil erosion** **Regulating soil quality** **Food provision** **Regulating water flow** **Regulating water quality** **Regulating coastal erosion and flooding** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion cont.				**... continued from previous page** Coastal salt marsh can dissipate wave energy and reduce the level of flooding. Erosion and redeposition processes in coastal salt marshes are necessary to maintain a succession of diverse habitats. Sand dune soils are characteristically very droughty and unstable. Erosion and redeposition processes in dunes are necessary to maintain a succession of diverse habitats. Younger less vegetated dunes constantly change shape.	Understand soil changes that will take place in event of sea water rise/flooding and subsequent impact on land use and inland movement of the coastal salt marsh system. Enable natural movement of coastal sand dune habitats.	
Pollination	Semi-natural habitats Farmland	The NCA contains relatively little high-quality habitat to support pollinating insects, with the exception of its lowland heathland. This will provide some nectar source for pollinating insects as do some boundary features such as the hedgerows and species-rich road verges.	Local	Pollinators play a role in food provision, through pollinating crops such as oilseeds and fruit. Heathland, woodland and grassland habitats provide habitats for pollinating insects and should be managed in good condition and expanded where possible to ensure this service continues effectively. Providing suitable nectar sources and the habitat structures required for pollinating insects should help to enable pollination.	Provide feeding, breeding and hibernation habitat for pollinators and beneficial predator species by maintaining, restoring and creating habitats, such as lowland heathland and species rich grassland. Enhance management and restoration of boundary features such as hedgerows and provide species-rich road verges for nectar provision and vegetation structure for pollinators.	**Pollination** **Food provision** **Sense of place/ inspiration** **Biodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pest regulation	Semi-natural habitats Farmland	The habitats in the area, such as hedgerows, grassland and lowland heathland can support a variety of species including predators of pest species.	Local	There is some evidence to suggest that certain habitats (such as hedges and unimproved grassland) can support populations of beneficial predator species which can help control common agricultural pests (for example, ladybirds can control aphids).[17]	A stronger and wider network of semi natural habitats would bring benefit for pest regulation, as well as pollination and biodiversity services.	**Pest regulation** **Food provision** **Pollination** **Biodiversity**
Regulating coastal erosion and flooding	Estuaries and associated habitats Wide sandy/ muddy beaches Coastal cliffs	The coastal frontage of the Wirral peninsula is located between the River Mersey to the east and the Dee Estuary to the west, with the North Wirral coastline facing north-north-west into Liverpool Bay and the Irish Sea. A number of public and privately maintained defences act to fix the position of the shoreline in some locations. Much of the coastline of the Dee Estuary and North Wirral Foreshore are internationally designated as Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site to protect the extensive intertidal mudflats and sand flats and coastal salt marshes and the numerous waterfowl that use the habitat. **Continued on next page...**	Regional	The main urban areas along the Dee Estuary frontage within this NCA are West Kirby, Heswall and Neston. The long-term plan is to continue to manage risks to commercial and industrial assets from flooding and erosion, but to also allow more natural evolution where appropriate. In order to mitigate the impacts of the defences on the evolution of the estuary in combination with expected long-term future sea level rise, a number of areas with potential for managed realignment have been identified. It was not, however, deemed appropriate to propose managed realignment as the headline policy in the Shoreline Management Plan in these locations in the short term until a suitable plan for delivering this realignment has been developed and all the potential options have been reviewed with stakeholders.[18]	Promote research towards gaining a deeper understanding of coastal sedimentary systems to aid the prediction of the likely effects of sea-level rise. Work with partners to find solutions that enable dynamic coastal processes to function as naturally as possible particularly where this supports and enhances natural flood defence mechanisms and allows for the conservation of important wildlife habitats, while taking into account the need to protect key facilities on the peninsula. Work with local landowners to find ways of adapting to coastal change where maintaining defences is not sustainable.	**Regulating coastal erosion and flooding** **Regulating soil erosion** **Sense of place/ inspiration** **Recreation** **Biodiversity** **Geodiversity**

[17] *Ecosystem Services from Environmental Stewardship that Benefit Agricultural Production,* Natural England (2012)

[18] *North West England and North Wales Shoreline Management Plan SMP2* – main document and Mersey Estuary (Unit 11a 7), North West & North Wales Coastal Group (July 2010; accessed from URL: http://mycoastline.org/index.php?option=com_frontpage&Itemid=1)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating coastal erosion and flooding cont.		**... continued from previous page** There are sections of eroding cliff near Thurstaton that are also designated Site of Special Scientific Interest (SSSI). There is tidal flood risk at several locations around the Wirral peninsula, which can arise from high water levels and from wave action. There are tidal defences for many of the areas at risk.		The northern Wirral coastline is significantly influenced by the Dee and Mersey estuaries at either end of the frontage. Coastal sand dunes and the wide sandy foreshore have formed along the length of the frontage. Coastal sand dunes provide a natural barrier to sea flooding. They provide natural protection to coastal settlements, including Hoylake, Moreton and Leasowe within this NCA, as well as coastal recreational sites. The whole frontage is currently defended, with the long term plan, subject to more detailed investigations, to continue to provide flood and erosion protection to the residential areas, infrastructure and low lying land along the frontage. [19] Erosion of the soft cliffs is important to maintaining their geological, faunal and floral interest (including Dee Cliffs SSSI), but is viewed as unacceptable to some coastal landowners. The Red Rocks shoreline is currently accreting rapidly to form new salt marsh and sand dunes. Similar accretion along the North Wirral Foreshore is contentious in the local community, regarded by some as a problem and by others as an opportunity for new soft sea defences and habitat.	Allow natural processes of erosion to occur where appropriate (including the slumping of unprotected soft cliffs around the Dee Estuary), to retain geological/ geomorphological and biological interests. Look for opportunities for delivering habitat creation, including managed realignment schemes, to create coastal habitats such as coastal salt marsh or other wetland habitats. Support the development of a successful England Coast Path that encourages better public access and is sensitive to the features that are found on or along the coast. Improve public understanding of the many features and functions of the estuary and coast.	

[19] *North West England and North Wales Shoreline Management Plan SMP2* – main document and Mersey Estuary (Unit 11a 7), North West & North Wales Coastal Group (July 2010; accessed from URL: http://mycoastline.org/index.php?option=com_frontpage&Itemid=1)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
A sense of place/ inspiration	Semi-natural habitats Geology and local building materials Coast and estuary	Sense of place is supported both from the peninsula coastline and the small scale mosaic of fields and villages connected by a network of lanes lined with red sandstone houses and country estates. Senses of inspiration and escapism, although constrained to some extent by urban development, are provided by the area's coastline of coastal salt marshes, sand flats and coastal sand dunes, with Hilbre Island providing a particularly reflective location for those crossing a low tide. In addition, the area's picturesque sandstone outcrops, parkland and estates, and long views over the Dee and Mersey to surrounding NCAs.	Regional	The coastal strip along the Dee estuary and north Wirral Foreshore is characterised by extensive areas of intertidal sand flats, mudflats, coastal salt marshes and coastal sand dunes. These areas are internationally important for populations of waterbirds. Inland, the area is characterised by a mosaic of former large country estates, parks and mixed farmland, with areas of improved pasture, arable farming, market gardening and growth of nursery stock. There are a series of country parks and Local Nature Reserves, including Hilbre Island, providing opportunities for people to enjoy the natural environment and landscape, while semi-natural habitats include extensive areas of lowland heathland and mixed woodland. Many traditional buildings are of local red sandstone with some older structures in half timber. **Continued on next page...**	Protect the distinctiveness of coast and estuary, with its internationally important habitats and species. Improve public understanding and support for the many features and functions of the estuary and coast including the active geomorphological processes and wildlife value. Seek opportunities to encourage appropriate access to natural environments, and to promote the calming and restorative effect that contact with tranquil, sensory and inspirational environments have on visitors' health and wellbeing. Provide networks of green infrastructure with accessible natural green spaces for people close to where they live and work. Ensure that tourism and leisure activities are conducted in an environmentally sustainable manner, providing interpretative and educational material and facilities.	**Sense of place/ inspiration** **Sense of history** **Tranquillity** **Recreation** **Biodiversity** **Geodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
A sense of place/ inspiration cont.				**... continued from previous page** In some locations there are expansive views across the landscape and towards the Welsh coastline.	Maintain and enhance the mosaic of semi-natural habitats including lowland heathland and wetland habitats. Respect local settlement patterns and building materials to avoid the loss of historic evidence in the landscape. Maintain and enhance open and expansive views of the landscape.	
Sense of history	Archaeological and historic features Geodiversity Cultural influences	Many historic field ponds, or 'pits' as they are often referred to locally, still remain as prominent features within the farmed landscape. Tower mills (a type of windmill) and the remains of mills (mill mounds) are quite a distinctive feature of the Wirral, reflecting a thriving arable economy in the 18th and 19th centuries. The remains of early nucleated settlement and the vestiges of townfield agriculture can still be detected along the peninsula. **Continued on next page...**	Regional	The history of the landscape is evident in the area's strong links to livestock farming and fishing. Protecting links with the past and enhancing our understanding of these will help strengthen the character of the area. Settlements and buildings are aspects of history that are likely to be particularly evident to the general public, as are the area's country houses and estates, which developed in the early 19th century based on the wealth generated in Liverpool and aided by improved ferries and rail services. There is evidence of settlement in the Roman period, while some place names indicate Norse presence in Wirral.	Opportunities to manage the NCA's agricultural, coastal, estuarine and lowland heathland landscapes for the sense of history they provide. Opportunities for sustainable recreation and tourism relating to history, ensuring that the area remains in suitable condition. Record coastal archaeological sites that are at risk of loss through coastal erosion. Seek to improve understanding of historic features and cultural heritage through improved interpretation and educational information, particularly associated with the development of the landscape.	**Sense of history** **Regulating coastal erosion and flooding** **Sense of place/ inspiration** **Tranquillity** **Recreation** **Biodiversity** **Geodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of history cont.		**... continued from previous page** The former port at Parkgate was a principal producer of shrimps. 18th- and 19th-century development is prevalent, consisting of a mix of large country houses and estates bounded by red sandstone walls, and towns and villages which act as dormitory settlements to workers from adjacent industrial areas. Country houses and estates including Burton Manor, Thornton Manor and Ness Botanic Gardens. There are 5,000-year-old submerged remains of a post-glacial forest on the Meols foreshore.		The 5,000-year-old submerged remains of a post-glacial forest on the Meols foreshore indicate that much of the Wirral at that time was some distance from the coast. Subsequent changes in sea level present the potential for the preservation of terrestrial landscapes beneath the extensive intertidal mudflats and sand flats of the Dee Estuary. Deposits (especially those formed in the Dee estuary) have the potential to preserve a wide range of archaeological features and structures such as the remains of abandoned or wrecked boats or fish traps.		

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	Long, distant sea views towards and from the coastline Semi-natural habitats	Tranquillity has declined significantly in the past 50 years, with the total area of the NCA classified as 'undisturbed' having decreased from just under 14 per cent in the 1960s to 1 per cent in 2007. [20]	Local	Only two small 'undisturbed' pockets remain, the first lying along the River Dee in the south-west corner of the NCA and the second east of Burton. There are pockets of more tranquil landscapes often associated with open spaces. A sense of tranquillity is likely to be associated with the area's coastline of coastal salt marshes, sand flats and coastal sand dunes, as well as its small areas of mixed woodland, picturesque sandstone outcrops, parkland and estates. The area around the M53 corridor provides break between the built-up areas of eastern and central Wirral. The highly urban areas of the Merseyside Conurbation and the Mersey Valley are adjacent to Wirral NCA. The close proximity of urban, rural and coastal landscapes leads to high public pressure on the coastal and rural areas, but also great need for the facilities they provide. However, visitor pressure can threaten sensitive habitats, species and landscape features and therefore needs to be managed appropriately.	Protect landscape features which contribute to sense of tranquillity, such as the area's coastline of coastal salt marshes, sand flats and coastal sand dunes, as well as its small areas of mixed woodland, sandstone outcrops, parkland and estates. Promote the calming and restorative effect that contact with tranquil and sensory environments has on peoples' health and wellbeing. Encourage sensitive development respecting long and open viewpoints and the character of the area. Carefully ensure that light spill is minimised through lighting design in new developments to minimise the impact on dark skies. Carefully manage recreation and access opportunities in a way that enables quiet enjoyment, while conserving habitats species and landscape features.	**Tranquillity** **Sense of place/ inspiration** **Recreation** **Biodiversity**

[20] *CPRE Intrusion Map,* Campaign to Protect Rural England (2007)

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation	Public rights of way network Wirral Way Country parks Local Nature Reserves Seaside resorts and coastline	Recreation is supported by the area's 160-kilometre rights of way network (with a density of 0.97 km per km^2), as well as 146 ha of open access land (just 0.9 per cent of the NCA), while a small proportion of the NCA (271 ha) forms part of The Mersey Forest. Routes include the Wirral Way, which forms part of Wirral Country Park. This is a 19-kilometre path in Wirral and runs from West Kirby to Hooton. Recreation is also supported by the cycle route network, with Sustrans cycle routes and the Wirral Circular Trail. Country parks (North Wirral Coastal Park, Royden Park, Arrowe Country Park and Wirral Country Park) and Local Nature Reserves (Burton Mill Wood, Heswall Dales, Thurstaston Common, Hilbre Islands). The area is known for its coastal recreation, has several golf courses adjacent to coastal settlements and is of outstanding ornithological interest. There are designated bathing beaches at West Kirby, Meols and Moreton.	Regional	Coastal areas are popular visitor destinations. Local Nature Reserves and country parks provide opportunities for people to enjoy the natural environment. The highly urban areas of the Merseyside Conurbation and the Mersey Valley are adjacent to Wirral NCA. The close proximity of urban, rural and coastal landscapes leads to high public pressure on the coastal and rural areas, but also great need for the facilities they provide. The provision of networks of green infrastructure, creating a high-quality environment can improve resilience to climate change, support biodiversity, provide recreational and educational opportunities, enhance the landscape, create local routes for walking and cycling, and provide accessible natural green spaces for people close to where they live and work. There are recreational opportunities such as walking associated with the footpath network, including the Wirral Way. Appropriate access can enhance visitors experience, increase their understanding of the local environment and lead to improvements in health and wellbeing. However, visitor pressure can threaten sensitive habitats, species and landscape features if not managed appropriately. **Continued on next page...**	Protect and enhance the quality of recreational facilities and access opportunities for users of all abilities, particularly at the coast, country parks and Local Nature Reserves, while seeking to minimise disturbance, particularly to bird populations and designated sites. Seek opportunities to enhance the rights of way and cycle route network, promoting sustainable access routes that contribute to people's health and wellbeing, improve people's understanding of the area and link public footpaths and settlements while conserving the area's sensitive habitats, species and landscape features. Provide networks of green infrastructure to enable recreational and educational opportunities, enhance the landscape, create local routes for walking and cycling and provide accessible natural green spaces for people close to where they live and work.	**Recreation** **Sense of place/ inspiration** **Sense of history** **Tranquillity** **Biodiversity** **Geodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation cont.				**... continued from previous page** The England Coast Path, a new National Trail, will give people the right of access around England's entire open coast, including spreading room, where appropriate. Wirral NCA and the Dee Estuary share a border with Wales. There are opportunities to ensure that cross-border links for pedestrians and cyclists are continuous. The coastal and estuarine landscape offers opportunities for recreation associated with wildlife, such as birdwatching. The archipelago of three islands, Little Eye, Middle Eye and Hilbre Island are located approximately 1 km from high water mark at the town of West Kirby, The islands are connected to the mainland at low tide, when they can be accessed by foot. This is a popular activity, especially in the summer months. Recreational activities have the potential to disturb breeding birds and high tide roosting sites at which large bird populations concentrate.	Support the development of a successful England Coast Path that encourages better public access and is sensitive to the features that are found on or along the coast. Seek to provide the best and most continuous cross-border links for pedestrians and cyclists, in relation to the England Coast Path, the Welsh Coast Path and other routes. Promote interpretation to help visitors and local people gain an improved awareness and understanding of the key nature conservation features within the area. Ensure tourism and recreational activities are carried out in a sustainable manner, reducing recreational disturbance by careful management of activities. Seek opportunities to improve water quality for the benefit of wildlife and recreational users in the area by working with water companies, industry, farmers, fishermen and local residents to minimise diffuse and point-source pollution.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity	Coast Habitats Species Rivers, ponds and wetlands	Priority habitats within the NCA include 469 ha of coastal and flood plain grazing mars, 286 ha broadleaved mixed and yew woodland (broad habitat), 106 ha of lowland heathland, 89 ha coastal sand dunes, 54 ha mudflats, 35 ha lowland meadows, 13 ha maritime cliff and slope, 9 ha reedbeds and 8 ha lowland dry acid grassland. The NCA includes one Special Area of Conservation (SAC), two Special Protection Areas (SPAs) and two Ramsar sites, while 1,500 ha are nationally designated as Site of Special Scientific Interest (SSSI). 23 Local Wildlife Sites covering 140 ha. The mosaic of farmland provides a feeding resource for birds. The rural area supports wide-ranging species including bats, brown hare and barn owl.	International	The coast and estuary is one of the NCA's primary wildlife assets, with significant internationally, nationally and locally recognised wildlife and habitats. The Dee Estuary and North Wirral Foreshore supports extensive areas of mudflats, sand flats, coastal salt marsh and coastal and flood plain grazing marsh, with internationally important numbers of wildfowl and waders. The coastal and flood plain grazing marshes bordering the Dee Estuary attract wetland birds in large numbers and represent important refuges for estuarine species at times of severe weather. There are small fragments of coastal sand dunes. A diverse range of plant and animal communities occur including populations of natterjack toads. The coastal habitats and species (SPA, SAC, Ramsar and SSSI) will be at risk from sea level rise. Natural regeneration/migration where appropriate and/or creating compensation habitats in areas of managed realignment will help ensure no net loss of habitat. **Continued on next page...**	Maintain biodiversity habitats and, where appropriate, enhance the extent, distribution and quality of the most important and characteristic types. Promote the recovery of degraded habitats. Ensure that coastal processes are allowed to function as naturally as possible allowing the formation of intertidal flats, coastal salt marshes and coastal sand dunes to proceed, thereby maintaining the coastal habitats and visiting bird populations of international importance. Avoid any potential net loss of habitat from 'coastal squeeze' by seeking opportunities for habitat creation, including realignment	**Biodiversity** **Water availability** **Climate regulation** **Regulating soil erosion** **Regulating coastal erosion and flooding** **Sense of place/ inspiration** **Recreation** **Geodiversity**

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity cont.				**... continued from previous page** The Dee Estuary forms an essential part of the route of migratory fish species, which have their breeding grounds upstream in the River Dee (River Dee and Bala Lake SAC). Species present include Atlantic salmon, sea trout, smelt, twaite shad and eels as well as sea lamprey and river lamprey. The coastal zone is dynamic. The salt marsh between Parkgate and Heswall is still accreting. Cliff recession is a natural process. Maritime cliffs and slopes are sensitive to erosion caused by increased rainfall which could result in more vertical slopes and more rapid retreat of coastal soft cliffs. Large tracts of lowland heathland occur on sandy hills in Wirral. A great number of birds, particularly waders like curlew and pink-footed goose rely on both grass and arable farmland areas as a source of food. The key areas for wading bird use on the Wirral are located on and to the west of the mid-Wirral sandstone ridge. These areas are also important for populations of farmland birds including skylark linnet, yellowhammer and tree sparrow. **Continued on next page...**	schemes to create coastal habitats such as coastal salt marsh or other wetland habitats. Ensure connecting links are provided between the estuary and inland areas. Maintain migratory routes for fish species such as sea and river lamprey, ensuring that their passage is unobstructed by physical barriers or poor water quality. Redevelop the natural transitions between intertidal sand flats/ mudflats, foreshore, coastal salt marsh, freshwater marsh, coastal sand dune, grassland and lowland heathland communities. Introduce appropriate management to sustain lowland heathland communities, giving due regard to individual habitat features such as patches of bare ground which are required by some species. Where feasible, re-establish habitat links between adjacent lowland heathland sites.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity cont.				**... continued from previous page** Ponds and hedgerows may serve as habitat 'stepping stones' or corridors, assisting local wildlife migrations and increasing the variety of species on farmland and in urban areas.	Maintain, restore or create lowland meadow, lowland heathland, acid grassland and other semi-natural and species-rich grassland. Maintain, restore or create wet grassland habitat for breeding birds. Maintain areas of grass and arable farmland for birds. Conserve and restore network of infield ponds 'marl pits', pond margins and pond landscapes. Conserve and restore hedgerows. Use nature reserves and other local green spaces, to encourage communities to become more involved in biodiversity close to where they live and work, taking part in biological recording through events such as bio-blitz, and by volunteering to be involved in site based conservation activities and in the future planning and management of these sites.	

Service	Assets/ attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity	Geomorphological processes Geological exposures	Three geological Sites of Special Scientific Interest (SSSI) and nine Local Geological Sites. The geology of the Wirral peninsula is dominated by glacial till overlying Triassic sandstone. The eastern shore of the Dee Estuary is backed by a stretch of till cliffs between Heswall and Hoylake. The cliffs are of geological and geomorphological importance for their sedimentary record and display of natural erosive processes. They are also of biological importance, particularly for their plant communities. The Triassic sandstones have historically been quarried for building stone.	Regional	Natural coastal erosion is prevalent on the soft cliffs and the presence of slumped material is common. Soft cliffs supply sedimentary material and therefore perform an important coastal processes role. Geological sites provide opportunities to interpret the local geodiversity, helping to inform and educate visitors and increasing their understanding and enjoyment. These sites also allow continued research into the geodiversity of the NCA. The relative isolation of the Wirral peninsula has ensured that pre-19th-century building stone had limited sources. The pink hues of the local red stone bring warmth to the landscape and provide a unifying theme in buildings, walls and bridges.	Allow the natural dynamic processes that affect both the estuary and coastline. Provide interpretation of the dynamic processes underway in the estuary and along the coast, to improve understanding and enjoyment. Maintain the integrity of geological and landform features within the area and enhance their value for interpretation, education and visual amenity. Ensure that significant geological and landform features are sufficiently documented and protected to enable the continued study of Wirral's geodiversity. Provide access to sites of geological interest, where appropriate, and interpret the geological features, to improve understanding and enjoyment. Maintain vernacular buildings and stone walls where possible to reinforce links with the underlying geology and strengthen sense of place.	**Geodiversity** **Regulating coastal erosion and flooding** **Sense of place/ inspiration** **Sense of history** **Tranquillity** **Recreation** **Biodiversity**

Photo credits

Front cover: Mosaic of farmland in north Wirral. Open land, where not farmed, often has uses such as grazing for horses or golf courses. © Natural England/Ruth Critchley

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