National Character Area profile:

57. Sefton Coast

Supporting documents

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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.

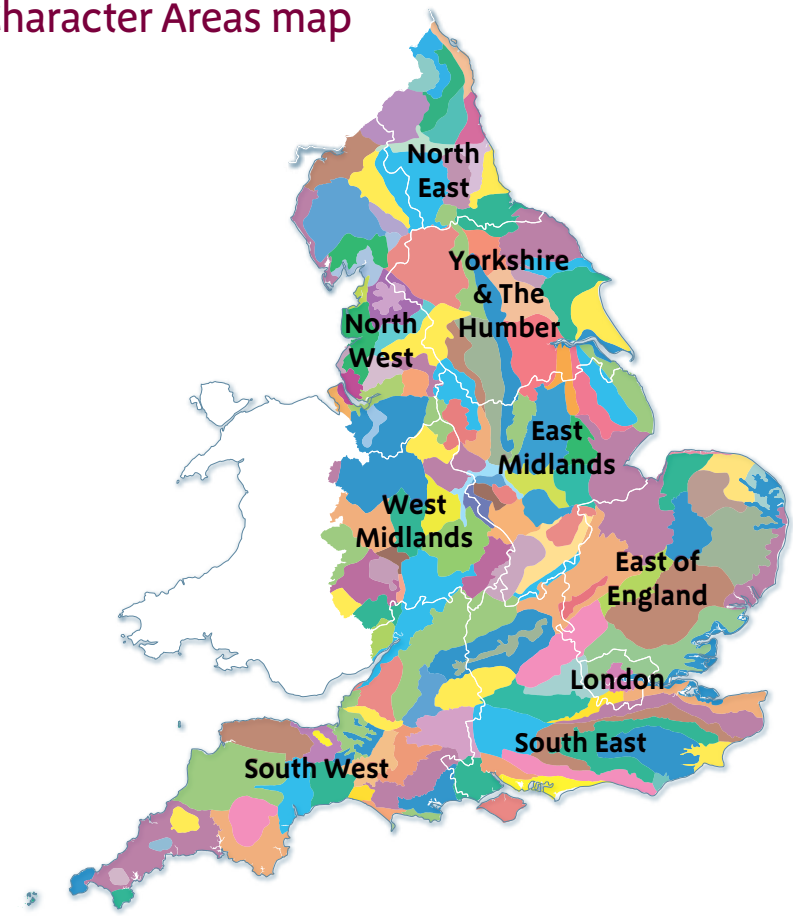
NCA profiles are guidance documents which can help communities to inform their decision-making about the places that they live in and care for. The information they contain will support the planning of conservation initiatives at a landscape scale, inform the delivery of Nature Improvement Areas and 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 Sefton Coast National Character Area (NCA) runs from the mouth of the Ribble Estuary in the north to the edge of Crosby in the south. It is characterised by intertidal sand flats and mudflats, coastal sand dunes, coastal dune heathland and conifer plantations, and is backed by farmland. It contains a series of coastal settlements that include Southport, Ainsdale, Formby and Hightown.

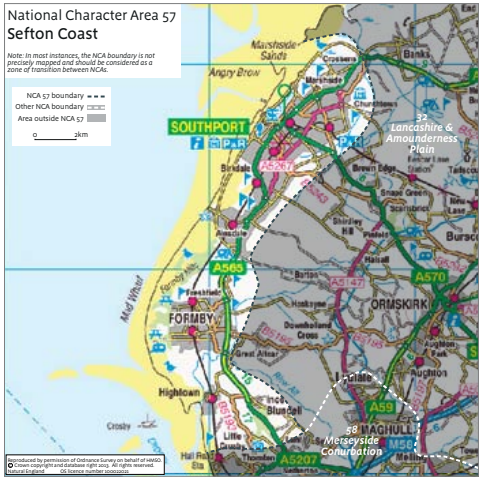
The sedimentary shoreline experiences a range of physical environments influenced by shallow water and high tidal ranges. This has led to the development of extensive sandy and muddy/sandy beaches along the coast. Dunes of recent wind-blown sand present the dominant landscape feature along much of the coast, rising locally to 20 m above sea level in the areas around Ainsdale and Formby. There are pine plantations on the dunes at Formby and Ainsdale.

Large areas of the coastline and estuaries are internationally designated for their conservation importance as wildlife habitats. The Sefton Coast Special Area of Conservation is internationally important for the sand dune complexes with all types of dune habitats. The Ribble and Alt Estuaries Ramsar site and Special Protection Area are internationally important for a wide range of birds and other wetland species. There are populations of many internationally, nationally and regionally important species including natterjack toad, sand lizard and red squirrel.

The Sefton Coast is valued as an important recreation and conservation resource. The coastline, coastal resorts and historic towns offer recreation opportunities for local communities and visitors. There is a series of National Nature Reserves and Local Nature Reserves along the coast, as well as the National Trust reserve at Formby, the Royal Society for the Protection of Birds' reserve at Marshside and the Wildlife Trust for Lancashire, Manchester and North Merseyside's Freshfield Dune Heath. These provide opportunities for recreation, including wildlife watching, volunteering and education. There are also many access points to the beach.

Water quality, quantity and seasonal fluctuations are all important in managing habitats such as coastal and flood plain grazing marsh and dune slacks. The quality of bathing water is a concern for many coastal resorts, including Southport. Ongoing coastal change is leading to both losses and gains of habitats. New habitat is forming at Southport (coastal salt marsh) and Birkdale (coastal sand dunes and marshes). At Formby the mobile dunes are migrating landwards in response to coastal erosion. Beaches, intertidal habitats and dune systems can provide a natural and cost-effective means of flood defence.

Key challenges include integrating the recreation and visitor pressures associated with the seaside towns with the protection and enhancement of the internationally, nationally and locally important habitats and species. Coastal erosion is a further challenge, with the need to understand dynamic coastal and estuarine processes. Planning for and managing adaptation to coastal change is important. Ensuring a sustainable approach to coastal management is a challenge for the future of this coastline.



Click map to enlarge; click again to reduce

Statements of Environmental Opportunities:

- **SEO 1:** Adapt to and plan for coastal change, working with coastal processes and accepting the dynamic character of this lowland coastline with its long wide arc of sandy beaches, muddy estuaries and coastal sand dune system, conserve semi-natural habitats and reduce fragmentation.

- **SEO 2:** Promote sense of place by conserving and managing the coastal towns and villages while providing good green infrastructure links and interpreting Sefton's geology, archaeology and history to enhance people's enjoyment of the historic environment.

- **SEO 3:** Enhance people's understanding and appreciation of the Sefton Coast's natural environment, celebrating nature and wildlife, providing opportunities for recreation and access, as well as areas of tranquillity, as a source of inspiration, enjoyment and learning for the health and wellbeing of local people and visitors while retaining and enhancing the features of nature conservation interest.

- **SEO 4:** Promote the sustainable use of the terrestrial and marine resources of the Sefton Coast, working with landowners and managers to improve biodiversity, improve water quality and supply, sustainably address flood risk management and contribute to landscape character.

Dune slack in flower.

Description

Physical and functional links to other National Character Areas

The Sefton Coast National Character Area (NCA) lies along the coastal edge of the Lancashire and Amounderness Plain NCA extending southwards from the Ribble Estuary to the northern edge of Liverpool and the Merseyside Conurbation NCA.

This sedimentary coastline has a long expanse of coastal and estuarine habitats forming an ecological link along the edge of the NCA, from Crosby to the mouth of the Ribble Estuary. Offshore, there are Marine Protected Areas in Liverpool Bay, adjacent to the Sefton Coast NCA.

The River Alt rises in the urban area of Huyton, in the Merseyside Conurbation NCA, and flows into the Irish Sea at Hightown, south of Formby. The wide flood plains of the Crossens catchment extend into the Lancashire and Amounderness Plain NCA, with a large network of modified watercourses and a complex land drainage system discharging into the Ribble Estuary.

The varied tidal regime of the Irish Sea and the orientation of the coastline relative to the prevailing winds result in complex coastal processes. Sediment erosion, transport and deposition result in both sand dune erosion and accretion on the Sefton Coast and salt marsh accretion in the Ribble Estuary. Accretion is also occurring around Southport Pier (north and south).

There are extensive views across the Ribble Estuary and along the coastline, including distant views of Blackpool where the tower and roller coasters are visible, while in Liverpool Bay shipping lanes and wind turbines can be seen. In clear conditions, views extend to the Coniston Fells, Bowland, the West Pennine Moors, the Welsh mountains and Anglesey. Inland views over the Lancashire and Amounderness Plain NCA are more limited due to the flat character of the agricultural landscape.

The area has a good road and rail network, the most significant being the A565 coast road and the railway line linking Liverpool and the Merseyside Conurbation NCA to the settlements along the Sefton Coast.

The Ribble Estuary, with views towards Blackpool in the distance.

Key characteristics

- Sedimentary coastline with wide, gently sloping beaches, estuaries, coastal sand dunes, coastal dune heathland, conifer plantations and settlements backed by farmland; low-lying, rising in places to 20 m above sea level
- Underlying soft sandstones and mudstones of Triassic age are almost entirely masked by thick deposits of glacial and more recent drift.
- A dynamic coastal landscape affected by the movements of the sea and wind; the estuary and dune systems are subject to ongoing change.
- Inland, the low-lying hinterland is pumped to drain the land for agriculture and to provide flood protection for urban areas such as Southport.
- Large conifer plantations (housing a colony of red squirrels) around Formby and Ainsdale, with isolated wind-sculpted deciduous woodland on estates and farmsteads.
- A mixture of agriculture, ranging from open grazed marshes to areas of reclaimed pasture and enclosed fields supporting dairy or beef cattle and some arable farming.
- Field boundaries include hedgerows, ditches, post-and-wire fencing and embankments.
- An extensive coast with internationally, nationally and locally recognised wildlife and geological sites including intertidal mudflats and sand flats, coastal salt marsh, embryonic shifting dunes, mobile dunes, dunes with creeping willow, humid dune slacks, fixed dunes, dune grasslands and dune heathland; the significant dune system is one of the largest in England.
- Evidence of human activity goes back to the Mesolithic period, but settlement was sparse until the 19th century; development is primarily of Victorian date or later, orientated as a line of tourist/commuter towns and villages along the coastal railway and road.
- Coastal recreation facilities arise from the seaside tourist attractions, beach access, public rights of way and the coastal footpath; chalet/caravan sites and several golf courses introduce a manicured appearance into this varied coastline.

Coastal sand dunes at Ainsdale.

Sefton Coast today

The Sefton Coast NCA runs from the mouth of the Ribble Estuary in the north to the edge of Crosby in the south. It is characterised by intertidal sands and silts, coastal sand dune systems, coastal dune heathland and conifer plantations and is backed by a hinterland of flat farmland. It contains a series of coastal settlements including Southport, Ainsdale, Formby and Hightown. The landscape is low-lying with gently sloping wide beaches and sand dunes, rising in places to 20 m above sea level.

The coastline comprises soft and granular estuary deposits of sand, silt, clay and peat. The shoreline is constantly changing in response to the influence of fluctuating wind and water and as result of human activity. Extensive sandy and muddy/sandy beaches have developed. Dunes of recent wind-blown sand present the dominant landscape feature along much of the coast. The dune complex extends for more than 17 km with an average width of about 1.5 km. This significant dune system is eroding around Formby Point, but is also accreting to the north and south. Inland of the dunes, the background land surface elevation of the till and alluvial plain rarely exceeds 10 m.

The hydrology is complex because much of the area is at or below sea level. The coastal hinterland is extensively pumped to drain the land for agriculture and to provide flood protection for urban areas.

Tree coverage, with the exception of the conifer plantations, is sparse and is restricted to small wind-sculpted woods, copses and hedgerows trimmed by the salt-laden winds. Woodland pockets and copses are found mostly to the south around the parkland and former parkland at Ince Blundell and Little Crosby, as well as at Churchtown in the north-east. Trees and woodlands also accompany the golf courses and rifle range in the area. The extensive coniferous woodlands, established in the Formby area early in the 20th century, are now home to a colony of red squirrels. Red squirrel populations also occur in the woodlands of the hinterland and the area is noted as a red squirrel stronghold. The Mersey Forest covers much of the area, encouraging the establishment and conservation of a mixed landscape of dunes, woods, grasslands and heathlands.

Beach showing the strandline.

Inland from the coast is a low-lying hinterland of high-quality agricultural land. There is a mixture of agriculture, ranging from grazed open marshes, areas of reclaimed pasture and enclosed fields supporting dairy or beef cattle and some arable farming. Other land, usually near residential areas, is used for horse grazing. The ordered agricultural landscapes contrast with the wilder and more dynamic landscapes associated with the coast. A unique aspect is the surviving small fields created by the former growing of asparagus on sandy coastal soils. The fields of the coastal hinterland are used by wildfowl and waders for roosting and feeding. This agricultural land also supports some important breeding populations of farmland birds, especially lapwing, as well as internationally important overwintering flocks of pink-footed geese.

Scenery of coastal sand dunes and pines.

Field boundaries include hedgerows, ditches, post-and-wire fencing and embankments. Ancient enclosure is scarce, while post-medieval enclosure is well represented along the eastern edge of the area, related to settlements inland and a semi-regular series of parallel roads and tracks leading towards the coast.

Semi-natural habitats include intertidal mudflats and sand flats with areas of coastal salt marsh and coastal sand dunes. The terrestrial side of the coastal zone also supports areas of dune grassland, coastal dune heathland and woodland.

The River Alt is small but associated with it there is a large expanse of estuarine habitat, with extensive sand flats. To the north of Southport there are mudflats and salt marshes around the Ribble Estuary. All these estuarine habitats are of outstanding international importance for migratory birds, wading birds and wildfowl.

The whole range of dune types can be found, from shifting dunes with marram to dune grassland and dunes with creeping willow. Between the dunes, there are lower-lying areas known as humid dune slacks. In places, the leaching of calcareous shell material has resulted in soil acidic enough for the establishment of heathland vegetation. The dunes support many nationally scarce and uncommon plants and invertebrate species, as well as sustaining isolated populations of natterjack toad and sand lizard, the latter being the northernmost population in Britain. Other noteworthy species include great crested newt, sandhill rustic moth, dune helleborine and a liverwort known as petalwort.

Much of the coastline is internationally designated for its conservation importance as wildlife habitat. The Sefton Coast Special Area of Conservation (SAC) is internationally important for its range of sand dune habitats, while

the Ribble and Alt Estuaries Ramsar site and Special Protection Area (SPA) are internationally important, with a wide range of bird species.

Settlement is orientated as a line of towns and villages along the coast. Settlements are typically based on historic agricultural or fishing origins, with Southport subsequently developing into a 19th-century seaside resort but ultimately becoming more general in character with modern mixed residential and industrial uses. Formby developed substantially as a result of 20th-century commuter housing, but remains a tourist destination due to its proximity to the sand dunes and coast. Smaller holiday and dormitory towns and villages include Hightown, Birkdale, Ainsdale, Hillside and Churchtown.

The range of formal recreational facilities such as chalet/caravan sites and golf links introduce a manicured appearance into this varied coastline. The association of large Victorian residences in combination with landmark features such as Southport Pier, the Marine Lake and the amusement park and the proximity to sand dunes and coast contribute to the overall sense of place. Development is primarily Victorian or later, with buildings mainly of brick. Traditional building materials are timber frame, sandstone and, from the 18th century, brick and tile with Welsh slate roofs.

The coastal sand dune complex has been heavily modified by human activity such as forestry, agriculture, sand extraction and various forms of development. Nevertheless, some areas still offer a sense of remoteness and seclusion. The dune complex can induce a sense of disorientation and a strong sense of wildness among the larger dunes, with the available views tending to be short and enclosed by the undulating landform. However, wider vistas of the sea are seen from dune summits and from the wide open beaches.

The area has a good road and rail network, the most significant of these being the coast road and railway lines linking to Liverpool and Manchester. Inland, a semi-regular series of parallel roads and tracks lead towards the coast.

The Sefton Coast is valued as an important recreation and conservation resource, with three National Nature Reserves (NNRs) and two Local Nature Reserves. In addition, land is managed for nature conservation by the National Trust, the Royal Society for the Protection of Birds (RSPB) and the Wildlife Trust. The Trans Pennine Trail extends from coast to coast between Southport and Hornsea. The Sefton Coastal Path forms part of the Trans Pennine Trail and is heavily utilised, as is the foreshore.

The Alt Estuary.

The landscape through time

The Sefton Coast NCA is covered by thick and variable glacial and post-glacial drift deposits masking a low-relief surface of Triassic sandstones and mudstones that are rarely exposed. The drift cover of glacial outwash sands and gravels and softer tills has infilled local irregularities (such as former river channels and small scarp features) in the bedrock surface, creating a generally flat landscape that mirrors the underlying low bedrock relief.

Variation of sea level and coastline position during and immediately after the last ice age guided the deposition of marine, estuarine and river alluvium across different parts of the area and these are associated with remnants of ancient blown sand (known as the Shirdley Hill Sand Formation) and lenses of older peat and sandy peat. Between the last ice age and medieval times, the sea occasionally broke through the coastal dune barrier and flooded low-lying inland areas. Peat and peaty alluvium have formed in local hollows and valleys.

The earliest evidence for human activity is found at Formby Point. Here, coastal erosion of the foreshore has revealed human, animal and wading bird footprints preserved in laminated silts and dating from the Mesolithic Period (7,000–5,000 years ago).

Later peat deposits show evidence for domestication of oxen during the Iron Age. Place names such as Ainsdale, Formby, Ravenmeols and Altcar testify to the influx of Norse settlers along the Lancashire coast in the 9th and 10th centuries. The pattern of dispersed settlement reflects the scarcity of farming land amid the mosses and meres, dating from before and after the Norman Conquest. The foundation of some of the medieval abbeys led to further drainage of the wetlands.

The coastal sand dunes have been significant in local life for many centuries. Marram grass was considered so important for building and maintaining the sand dunes that in the early 1600s landowners employed 'Hawslookers' to watch over the dunes and fine anyone caught cutting marram for thatch. By the mid-1700s, many local property leases imposed duties on tenants to plant marram grass, also known as starr grass, with 'Starr Setters' appointed to oversee the planting. Large areas were maintained as rabbit warrens and used for livestock grazing throughout the 17th and 18th centuries, while later agricultural developments included conversion of poor nutrient coastal sands into farmland, notably for asparagus farming.

Ruins of the lifeboat station on the beach at Lifeboat Road.

The hinterland was drained for agriculture in the 18th and 19th centuries. The River Alt was tidal nearly as far as the village of Sefton and flooded regularly, until works to establish flood gates in the 19th century led to further land drainage, changing the inland landscape. Drainage works allied to the laying of the railway opened up the landscape to mixed farming serving both local needs and wider markets.

The introduction of the railway in the 1840s prompted the development of coastal resorts from the earlier pattern of low-density rural settlement. The largest settlement is Southport, which expanded rapidly as a holiday resort and dormitory town during this period. Along the Ribble Estuary land was 'claimed' from the sea for the growth of Southport and for agricultural use.

Southport Pier.

A large area was afforested in phases from the late 19th century. The Formby Estate landowners planted pine trees to gain long-term income from land that was viewed as unprofitable waste. These pine plantations are now a distinctive part of the local landscape, as well as being home to red squirrels.

The end of the 19th and early 20th century witnessed further change in land use in the Sefton Coast NCA. This included the introduction of golf courses; sand extraction as a major industrial activity at many sites; the military use of some areas, for example Woodvale aerodrome; the tipping of tobacco waste in disused asparagus fields; and the development of facilities for recreation, including car-parking areas, caravan parks and holiday chalets.

Although evidence of a rural settlement pattern still remains, with some older field patterns in existence, settlements such as the fishing hamlets of Formby and Hightown have expanded as recreation centres and dormitory towns for Liverpool and now comprise a significant part of the NCA.

In 1978 the Sefton Coast Management Scheme was established, developing a co-ordinated approach to coastal management. In the 1990s the Sefton Coast Life Project supported nature conservation management along the Sefton Coast, including land purchase, habitat restoration and species recovery actions, and produced site management plans.

In the early 21st century the Sefton Coast Partnership was formed to ensure an integrated approach to the management of the coast for the benefit of all.

Ecosystem services

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

Provisioning services (food, fibre and water supply)

- **Food provision**: Agricultural interests include livestock grazing and mixed arable on the richer soils of the Alt flood plain. Grazing is also used as an important element of habitat management. A number of commercial fisheries operate within Liverpool Bay. Sustainable food provision can provide other environmental and recreational benefits.

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

- **Regulating soil erosion:** Most of the soils covering this NCA are susceptible to erosion. The sandy and peaty soils in the coastal hinterland are especially vulnerable to erosion. Any loss of, or damage to, soils may have further impacts on habitats and on other services such as farming and carbon storage. Trees and woodlands can help to minimise erosion in some locations. Sand dune soils are characteristically very prone to drought and unstable. Erosion and redeposition processes in coastal sand dunes are necessary to maintain a succession of diverse habitats.
- **Regulating water quality:** Water quality test sites located on the coast at Formby, Ainsdale and Southport detected faecal indicator organisms which are thought to be related to the sewage treatment works and septic tanks and not from agriculture. Bathing water quality is a major concern for many key tourist locations, including Southport. Biodiversity and fisheries also depend upon good water quality.
- **Regulating water flow:** The Alt Crossens area is low lying, with considerable areas of high-grade farmland and urban areas. The hydrology of the area is complex because much of the catchment is at or below sea level. The system is largely managed through artificial means, with substantial intervention to maintain water levels. Ultimately, heavy reliance is placed upon the two main pumping stations of Altmouth and Crossens at the tidal outfalls to evacuate water from the Alt and Crossens catchments respectively. A number of satellite pumping stations provide land drainage to rural areas of the catchment. River restoration projects can help to manage flooding, enhance fluvial flood plains and provide other environmental benefits. Water management through the use of sustainable drainage systems to manage rainfall and run-off in developments can often also provide landscape and environmental enhancement, habitat provision and access to nature.
- **Regulating coastal flooding and erosion:** The Sefton Coast frontage is characterised by a wide sandy foreshore backed by coastal sand dunes and areas of pine plantations. This significant dune system, extending up to 4 km inland at Formby, is eroding around Formby Point, but is also accreting to the north and south. Planning for and managing adaptation to coastal change is important on this coastline. Beaches, intertidal habitats and dune systems can provide a natural and cost-effective means of defence.

Cultural services (inspiration, education and wellbeing)

- **Sense of place/inspiration:** Sense of place is provided by the broad-scale, open, low-lying and distinctive coastal landscape of sand dunes, sandy beaches, intertidal mudflats and salt marshes with areas of pine plantations. Feelings of escapism and tranquillity are associated with the quiet, undeveloped areas along some parts of the coast.

- **Sense of history:** The impact of 19th- and 20th-century development contributes to a dynamic coastline, with rich archaeological evidence of human settlement and activity.

Dune slack pool.

- **Recreation:** The coastline, coastal resorts and historic towns offer recreation opportunities for local communities and visitors. There is a series of NNRs and Local Nature Reserves along the coast, as well as the National Trust reserve at Formby, RSPB Marshside to the north of Southport Pier, and the Wildlife Trust for Lancashire, Manchester and North Merseyside's Freshfield Dune Heath where the red squirrels are a popular attraction. These are a key asset, providing opportunities for recreation, including wildlife watching, volunteering and education, and they are well used. There are many access points to the beach.

- **Biodiversity:** The coastline has an exceptionally rich diversity of fauna and flora. The Sefton SAC is internationally important for the coastal sand dune complexes with all types of dune habitats. There are populations of many internationally, nationally and regionally important species, including natterjack toad, sand lizard and red squirrel. The Ribble and Alt Estuaries Ramsar site and SPA are internationally important, with a wide range of birds and other wetland species. Inland, there is supporting habitat for species such as pink-footed geese and other birds that are designation features of the nearby internationally important sites.

- **Geodiversity:** Part of the coast is a nationally designated Site of Special Scientific Interest for coastal geomorphology, in particular for the large, mobile dune system and the multiple sand bars that occur on the foreshore. Relatively stable bar features occur in the intertidal zone and many different bedforms are represented on the foreshore. The associated sediment sequence at Formby Point and fossil forest at Hightown provide a valuable chronology of the development of the Sefton Coast dune system, changing environments and vegetation over the last 7,000 years.

Statements of Environmental Opportunity

SEO 1: Adapt to and plan for coastal change, working with coastal processes and accepting the dynamic character of this lowland coastline with its long wide arc of sandy beaches, muddy estuaries and coastal sand dune system, conserve semi-natural habitats and reduce fragmentation.

For example, by:

- Maintaining the function of geomorphological processes, allowing the natural evolution of the coast, as well as the dynamic process of erosion and accretion, to continue where possible, allowing beaches, intertidal habitats and the coastal dune system to provide a natural and cost-effective means of defence.
- Planning for change at the coast, looking for opportunities for the creation of new habitats and 'roll-back' of existing habitats where the coast erodes, to maintain and enhance local landscape character, sense of place, biodiversity and reduce flooding to built-up areas.
- Seeking opportunities for the restoration and creation of coastal habitats, such as coastal salt marshes, coastal flood plain and grazing marsh, to avoid any potential net loss of habitat from 'coastal squeeze', to enhance biodiversity and contribute to landscape character.
- Promoting research in order to gain a deeper understanding of the changes that will take place as a result of climate change, and the subsequent impact on land use and movement of coastal and estuarine habitats and species, to inform future management needs.
- Promoting research and surveys to increase an understanding of habitat and species management, using this to inform effective habitat management and to develop practical solutions to maintain and enhance biodiversity.
- Maintaining and enhancing the nationally and internationally important sites and species, restoring and, where possible, linking the mosaic of coastal and estuarine habitats including intertidal mudflats and sand flats, coastal salt marsh, embryonic shifting dunes, mobile dunes, dunes with creeping willow, humid dune slacks, fixed dunes, dune grasslands and dune heathland and ensuring their sound management.

Red squirrels can occasionally be seen in among the area's pine plantations.

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- Maintaining and enhancing the exceptional biodiversity of the Sefton Coast National Character Area (NCA), with its network of Local Wildlife Sites, to provide multiple benefits including providing habitats for wildlife, reducing flood risk and enhancing the landscape.
- Assisting habitats to adapt to coastal change and climate change, building in capacity and resilience in the face of climate change; reducing the impacts of fragmentation by providing corridors or stepping stones for the movement of species.
- Maintaining and, where appropriate, enhancing the population numbers, population viability and distribution of nationally and internationally important species of plants and animals and key species which are characteristic, in particular, natterjack toad, sand lizard, wildfowl and waders.
- Maintaining the natural functioning of the dune aquifer and the quantity and quality of water in the dune aquifer and dune slacks; managing the humid dune slacks and ponds to protect their geomorphological interest and enhance populations of key species.
- Ensuring that conditions are suitable for maintaining and, where appropriate, expanding the populations of key wildfowl and waders.
- Working in partnership across all sectors to deliver actions for a strong vision for the future management of the coastline.

Natterjack toadlet.

SEO 2: Promote sense of place by conserving and managing the coastal towns and villages while providing good green infrastructure links and interpreting Sefton's geology, archaeology and history to enhance people's enjoyment of the historic environment.

For example, by:

- Developing sustainable visitor opportunities to coastal towns and villages, including the Victorian history and heritage of Southport, to promote the heritage of the Sefton Coast.
- Providing green infrastructure and retaining green space between settlements, to provide multiple benefits including the provision of recreational green space, reducing flood risk, enhancing the landscape, providing shade and filtering air pollutants.
- Maintaining and managing woodlands and other recreational green space for people to enjoy, looking for opportunities for woodland creation, including wet woodland in appropriate locations within green infrastructure in and around urban areas to deliver multiple benefits, while protecting sensitive habitats.
- Maintaining the population of red squirrels through the application of appropriate woodland habitat management, including climate change adaptation measures.
- Ensuring that new developments incorporate sustainable urban drainage systems and do not exacerbate flooding events, by incorporating permeable surfaces and rainwater harvesting.
- Raising awareness of the role of natural habitats in water treatment, either through formal sites planted with reedbeds, or the use of green space within urban areas to absorb run-off from roads and hard infrastructure.
- Deepening appreciation among landowners and the public of the links between geology, landscape, wildlife habitat and past land uses, such as asparagus farming, drawing attention to their relevance to sustainable development.
- Raising awareness and increasing public engagement, enjoyment and understanding of the historic environment, linking to coastal change, allowing for the interpretation of coastal geomorphological processes.
- Encouraging a better understanding of the value of the coast and its history, geology, habitats and wildlife through the provision of interpretation material and educational events.
- Conserving sites that have been identified for their geological interest, enhancing their value for interpretation, education and visual amenity; where possible, providing opportunities to view them and to further research and understand the area's geology.
- Managing and maintaining the area's historic environment, while recognising the rich archaeological potential of the coastline and inland mosses in particular, through interpretation of and understanding their significance in their landscape context.
- Where coastal processes reveal historic sites, encouraging the capture and recording of historic and archaeological information for future study.

SEO 3: Enhance people's understanding and appreciation of the Sefton Coast's natural environment, celebrating nature and wildlife, providing opportunities for recreation and access, as well as areas of tranquillity, as a source of inspiration, enjoyment and learning for the health and wellbeing of local people and visitors while retaining and enhancing the features of nature conservation interest.

For example, by:

- Conserving sense of place by providing opportunities for people to enjoy and understand the coastal habitats and natural features of the Sefton Coast; and promoting interpretation to help visitors and local people gain an improved awareness of the importance of this coastline.
- Maintaining the senses of inspiration and escapism that are associated with features of the coastline such as the flat, low-lying land which provides atmospheric views across the sea, and the mudflats, sand banks and dunes, conserving the sense of remoteness, 'wildness' and tranquillity.
- Ensuring that tourism and leisure activities are conducted in an environmentally sustainable manner; monitoring and reviewing recreational and tourism use; seeking to minimise disturbance and damage to habitats and wildlife.
- Promoting educational opportunities linked to biodiversity, for example at National and Local Nature Reserves, enabling people to understand and enjoy wildlife and the benefits of a healthy natural environment.
- Managing recreation and access opportunities in a way that allows for quiet enjoyment, while conserving the special qualities and features of the area, such as at National and Local Nature Reserves.
- Promoting active involvement through a wide range of volunteering opportunities and other activities to benefit habitat management, to increase community awareness and understanding and to provide other benefits such as improving health and wellbeing, social inclusion, learning and personal development.
- Managing the access network of local walking and cycling routes, including existing and future coastal access provision, providing links between urban areas and the surrounding coast and countryside, and enabling people to benefit from the health, exercise and mental wellbeing that access to the natural environment provides; and providing green infrastructure as recreational green space for multiple benefits.
- Ensuring that people have access to green space and green routes close to where they live, so that they can access them easily and enjoy the associated benefits for their health and wellbeing while learning about nature and the environment, and providing wildlife corridors.
- Improving access to the coast for walking and cycling and for people with disabilities through the sustainable use of old railway lines, tracks and paths while encouraging reduced car use; securing opportunities for the public to enjoy the natural environment through the implementation of the England Coast Path while ensuring appropriate protection of it.
- Ensuring that the promotion of access opportunities educates people about the vulnerability of the coastal habitats in the NCA and encourages visits of a low-impact nature which avoid any adverse impacts on agricultural management, landscape, habitats or wildlife.

SEO 4: Promote the sustainable use of the terrestrial and marine resources of the Sefton Coast, working with landowners and managers to improve biodiversity, improve water quality and supply, sustainably address flood risk management and contribute to landscape character.

For example, by:

- Working with the farming community to encourage sustainable food production in the coastal zone and hinterland, while delivering other benefits such as maintaining soil condition and water quality and conserving soils that sequester and store carbon.
- Encouraging management of farmland to improve soil structure, such as planting winter cover crops, in-field grass areas to prevent run-off, permanent grassland with low inputs and buffer strips on cultivated land adjacent to watercourses, improving the infiltration of rainwater, to give benefits for soil quality, soil erosion, water quality, water availability, flood alleviation, food production and biodiversity.
- Encouraging farmers to provide good habitat for farm wildlife and food sources for pollinators and predators of pest species, such as by introducing grass margins, pollen and nectar strips, and grass and tree buffers along watercourses.
- Encouraging cultivation practices that will benefit wildlife, such as farmland bird species and wildfowl as well as pollinating insects, by adopting land management interventions such as fallow within rotations, overwintering stubbles, uncropped field margins, creating pollen and nectar strips and planting bird seed mixtures.
- Managing the plantations for timber production where appropriate and for red squirrel.
- Managing the field boundary network, retaining vegetation to form effective habitats for species such as water voles, providing links between wetland and other semi-natural habitats, improving water quality and preserving key landscape features.
- Encouraging the sustainable use of water through water efficiency features, rainwater harvesting and the re-use of grey water.
- Protecting and enhancing fluvial flood plains around the Alt and Crossens to sustainably manage water in the catchment, identifying opportunities to re-naturalise drainage as well as expanding or creating flood storage in relevant areas to manage flood risk, while supporting habitat enhancement for wildlife and reducing carbon emissions.
- Encouraging improvements in water quality by working with water companies, farmers, land managers and developers to minimise diffuse and point-source pollution to rivers and the sea; reducing nutrient, pollution and sediment load to watercourses and encouraging measures such as buffer strips to intercept run-off and pollutants.
- Enhancing the role of natural habitats in water treatment, either through formal sites planted with reedbeds, or the use of green space within urban areas to absorb run-off from roads and hard infrastructure.
- Working with the local fishing community to promote sustainable fishing practices so that fish stocks and marine ecosystems are maintained and restored.
- Liaising with new partnerships to maximise the onshore benefits of the offshore network of Marine Protected Areas.

Supporting document 1: Key facts and data

Sefton Coast National Character Area (NCA): 8,989 ha

1. Landscape and nature conservation designations

The Sefton Coast NCA has no National Parks, Areas of Outstanding Natural Beauty or Heritage Coast associated with it.

Source: Natural England (2011)

1.1 Designated nature conservation sites

The NCA includes the following statutory nature conservation designations:

Tier	Designation	Designated site(s)	Area (ha)	% of NCA
International	Ramsar	Ribble and Alt Estuaries	1,682	19
European	Special Protection Area (SPA)	Ribble and Alt Estuaries SPA, Sefton Coast SPA	652	7
	Special Area of Conservation (SAC)	Sefton Coast SAC	1,725	19
National	National Nature Reserve (NNR)	Ainsdale Sand Dunes NNR, Cabin Hill NNR, Ribble Marshes	417	5
National	Site of Special Scientific Interest (SSSI)	A total of 3 sites wholly or partly within the NCA	2,185	24

Source: Natural England (2011)

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

Most of these designated sites overlap with one another. Only Hesketh Golf Links SSSI is completely separate to other designated sites.

There are 29 local sites in the Sefton Coast NCA covering 2,221 ha, which is 25 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

Condition category	Area (ha)	% of SSSI land in category condition
Unfavourable declining	146	7
Favourable	509	23
Unfavourable no change	368	17
Unfavourable recovering	1,162	53

Source: Natural England (March 2011)

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

2. Landform, geology and soils

2.1 Elevation

The highest point within this low lying coastal NCA is 21 m. Dunes of recent wind-blown sand present the dominant landscape feature along much of the coast, rising locally to 20 m above sea level in the areas around Ainsdale and Formby. Inland of the dunes, the background land surface elevation of the till and alluvial plain rarely exceeds 10 m and the near sea level beaches and tide flats west of the dunes tend to be wide and sinuous.

Source: Natural England (2010), Sefton Coast Countryside Character Area description

2.2 Landform and process

The landform is a broad-scale open landscape comprising of low-lying coastal areas with intertidal sands, silts and muds, dune systems and dune heaths and salt marshes.

Source: Sefton Coast Countryside Character Area description

2.3 Bedrock geology

The Sefton Coast and much of the adjoining Lancashire Plain are underlain by soft sandstones and mudstones of Triassic age which are almost entirely masked by thick deposits of glacial and more recent drift, creating a generally flat, low-lying topography.

Source: Sefton Coast Countryside Character Area description, Natural England (2010)

2.4 Superficial deposits

The drift sequence consists of a semi-continuous spread of glacial till overlain by fluvio-glacial sands and gravels laid down as the ice sheets decayed at the end of the last ice age. Variations in sea level and the position of the coastline during and immediately after this period guided the subsequent deposition of marine, estuarine and river alluvium across the region, associated with the development of peat in localised hollows and shallow basins. Continued sea level changes since the end of the last ice age have led to some of the older drift being reworked to form the extensive beaches and adjoining dune belt that lie along the Sefton coast. These dunes, which are of recent windblown origin, form the dominant landscape feature in the region, rising locally to 20 m above sea level in the vicinity of Ainsdale and Formby. Inland of the coastal dunes, there is a gently undulating zone of blown sand, rarely exceeding 10 m, which is slightly raised above the adjoining fen peats.

Source: Sefton Coast Countryside Character Area description

2.5 Designated geological sites

Designation	Number
Geological Site of Special Scientific Interest (SSSI)	0
Mixed interest SSSI	1

There is 1 Local Geological Site within the NCA.

Source: Natural England 2011

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

2.6 Soils and Agricultural Land Classification

Forty-six per cent of the soil in this NCA is naturally wet, very acid, sandy and loamy soil which can have a weak structure but can be easily worked. However, 28 per cent of the soils are sand dune soils and are highly prone to

erosion. Grades 1, 2 and 3 agricultural land can be found further away from the coast where the Sefton Coast borders the Lancashire and Amounderness Plain. Grade 5 land is located along the coastal strip.

Source: National Soil Resources Institute Soilscapes Maps

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

Agricultural Land Classification	Area (ha)	% of NCA
Grade 1	837	9
Grade 2	1,470	16
Grade 3	180	2
Grade 4	693	8
Grade 5	1,393	16
Non-agricultural	1,281	14
Urban	2,994	33
No data	140	2

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

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

Name	Length in NCA (km)
River Alt	5

Source: Natural England (2010)

Please note: other significant rivers (by volume) may also occur. These are not listed where the length within the NCA is short.

3.2 Water quality

The total area of Nitrate Vulnerable Zone is 3,344 ha or 37 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 696 ha of woodland (8 per cent of the total area), although none of this 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 8,050 ha of this NCA, which is 90 per cent of the NCA area.

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

4.2 Distribution and size of woodland and trees in the landscape

Woodland in this area is restricted to small isolated pockets and copses. There are also large coniferous plantations at Formby and Ainsdale which form important sites for red squirrels.

Source: Sefton Coast Countryside Character Area description, Natural England (2010)

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	262	3
Coniferous	307	3
Mixed	47	1
Other	80	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	0	0
Ancient re-planted woodland (PAWS)	0	0

Source: Natural England (2004)

5. Boundary features and patterns

5.1 Boundary features

Field boundaries are defined by a combination of hedgerows and post-and-wire fencing. 4,445 m of boundaries had been entered into environmental stewardship agreements by March 2011.

Source: Sefton Coast Countryside Character Area description, Countryside Quality Counts (2003), Natural England (2011)

5.2 Field patterns

There remains a rural pattern with some older field patterns in existence (post-medieval enclosures can be found towards the eastern fringe of the NCA).

Source: Sefton Coast Countryside Character Area description, Countryside Quality Counts (2003)

6. Agriculture

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

6.1 Farm type

Holdings are predominantly split between general cropping (33 per cent), lowland grazing livestock (17 per cent) and those classed as 'other types' (30 per cent). There are also small numbers of cereal, horticulture and specialist pig holdings. Data shows that between 2000 and 2009 the number of general cropping holdings increased by 25 per cent (2 holdings).

Source: Agricultural Census, Defra (2010)

6.2 Farm size

The number of smaller farms (less than 20 ha) decreased between 2000 and 2009 and there was an increase in the number of larger farms. The number of holdings decreased from 34 to 30, but the area of land farmed increased from 1,828 ha to 3,100 ha (an increase of 70 per cent between 2000 and 2009)*.

Source: Agricultural Census, Defra (2010)

6.3 Farm ownership

2009: Total farm area = 3,100 ha; owned land = 1,892 ha
2000: Total farm area = 1,828 ha; owned land = 915 ha

Source: Agricultural Census, Defra (2010)

6.4 Land use

Fifty per cent (1,545 ha) of the total farmed area is grass and uncropped land used for grazing livestock. Twenty-one per cent (647 ha) is used for cereals, 5 per cent (158 ha) for cash roots and 2 per cent (54 ha) for vegetables. Between 2000 and 2009 there was a 144 per cent increase in the amount of land classified as permanent grassland (632 ha in 2000, 1,545 ha in 2009)*.

Source: Agricultural Census, Defra (2010)

6.5 Livestock numbers

Cattle are the predominant livestock type within this landscape. Between 2000 and 2009 there was a 59 per cent decrease in the number of cattle in this NCA to around 500 animals.

Source: Agricultural Census, Defra (2010)

6.6 Farm labour

Farm labour primarily consists of principal farmers and full-time workers. Between 2000 and 2009 there was a 20 per cent decline in the number of principal farmers (from 50 to 40) and a 13 per cent decline in the number of full-time workers (from 60 to 52). There were also declines in the number of part-time and casual workers.

Source: Agricultural Census, Defra (2010)

***This increase in farmland may not be accurate. It may be that the survey data has taken into account the uptake of Higher Level Stewardship by Sefton Council. All of the land is under HLS options, but not all is farmland (it includes areas of sand dune and beach).**

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 coastal region is of international wildlife importance, the estuarine mud/sand flats and salt marshes providing important nesting habitats for many birds and the coniferous plantation to the north of Formby providing a home for a population of red squirrels. The majority of the undeveloped coast has SSSI status. Tree coverage, with the exception of the coniferous plantations around Formby, is sparse and is restricted to small wind-sculptured woods, copses and hedgerows trimmed by the salt-laden winds.

Source: Urban Mersey Basin Natural Area profile

7.2 Priority habitats

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

Red squirrels can occasionally be seen in among the area's pine plantations.

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 sand dunes	1,521	17
Lowland dry acid grassland	1,506	17
Coastal and flood plain grazing marsh	469	5
Lowland meadows	162	2
Purple moor grass and rush pasture	161	2
Broadleaved mixed and yew woodland (broad habitat)	87	<1
Lowland heathland	26	<1
Mudflats	1	<1
Reedbeds	1	<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

Settlement on the Lancashire coastline was limited until relatively recent times. Development, which has taken place in tourist/commuter towns, is primarily Victorian or later. There remains a rural settlement pattern, with some older field patterns in existence, despite the growth of small fishing hamlets such as Formby and Hightown into commuter towns following the development of the railway. The largest settlement is Southport which expanded rapidly as a holiday and dormitory town catering for the large industrial towns of Manchester and Liverpool. Rates of change to urban and the urban fringe area are low and 75 per cent of the NCA is within greenbelt.

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

8.2 Main settlements

The main settlements in the NCA are; Southport, Formby, Ainsdale, Birkdale, and Hightown. The total estimated population for this NCA (derived from ONS 2001 census data) is: 114,834.

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

8.3 Local vernacular and building materials

Buildings are a combination of brick and sandstone with modern housing on the periphery of the Victorian core.

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

The Alt Estuary.

9. Key historic sites and features

9.1 Origin of historic features

The introduction of the railway in the 1840s brought about a transition from a pattern of low-density rural settlement, with few significant nucleations and roots in the migrations of the early medieval period, to a string of coastal resorts.

Surviving areas of early nucleations, for example the historic core of Southport and the fishing villages of Formby and Hightown, are very limited in extent.

Much of area of the Victorian resorts as well as the later 20th century settlement expansions are built on reclaimed lowland moss. The pattern of early settlement was dispersed and of medium or low density reflecting the scarcity of farming land amid the mosses and meres. Drainage works allied to the laying of the railway opened up the landscape to mixed farming serving both local needs and wider markets. Dispersed and loose courtyard farmsteads are typical, mostly of late-18th or early-19th century date.

Ancient enclosure is scarce; only one small area on the east side of Formby. Post-medieval enclosure is well represented along the eastern edge of the NCA, related to settlements inland and a semi-regular series of parallel roads and tracks leading towards the coast. There are a few woodland pockets and copses, mostly to the south around the parkland and former parkland at Ince Blundell. In 1918 around 2 per cent of the NCA was historic parkland. Much of this has now been lost, although around 38 per cent of the remaining area is covered by a Historic Parkland Grant.

Coniferous woodland was planted to gain long-term income from land that was viewed as "unprofitable waste".

The extensive marshland may include significant archaeological deposits. At Formby Point, coastal erosion of the foreshore has revealed the footprints of humans, animals and wading birds preserved in laminated silts dated to a period some 7,000 - 5,000 years ago.

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

9.2 Designated historic assets

This NCA has the following historic designations:

- 4 Registered Parks and Gardens covering 124 ha
- No Registered Battlefields
- 4 Scheduled Monuments
- 360 Listed Buildings

Source: Natural England (2010)

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

Greenspace in Southport.

10. Recreation and access

10.1 Public access

- Ten per cent of the NCA or 881 ha is classified as being publically accessible.
- There are 30 km of public rights of way at a density of 0.3 km per km2.
- There are no National Trails within the area.

Source: Natural England (2010)

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

Access designation	Area (ha)	% of NCA
National Trust (Accessible all year)	0	0
Common Land	0	0
Country Parks	0	0
CROW Access Land (Section 16 Dedicated)	<1	<1
CROW Section 15	0	0
Village Greens	0	0
Doorstep Greens	0	0
Forestry Commission Walkers Welcome Grants	60	<1
Local Nature Reserves (LNR)	370	4
Millennium Greens	0	0
Accessible National Nature Reserves (NNR)	417	5
Agri-environment Scheme Access	0	0
Woods for People	260	3

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.

Visitors exploring the diverse coast.

11. Experiential qualities

11.1 Tranquillity

Based on the CPRE map of tranquillity (2006) the areas with the highest levels of tranquillity are found along the coast and sand dunes. The areas of lowest tranquillity can be found around the urban centres of Southport, Formby and Ainsdale.

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

Category of tranquillity	Score
Highest	39
Lowest	-72
Mean	-21

Sources: CPRE (2006)

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

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 34 per cent of the Sefton Coast is classified as urban. These urban areas are found around Southport, Formby, and Ainsdale. Away from these urban areas most of the landscape is classified as disturbed. Intrusion is caused by development and transport routes such as the A565 and the railway line.

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

Intrusion category	1960s (%)	1990s (%)	2007 (%)	Percentage change (1960s-2007)
Disturbed	66	60	66	0
Undisturbed	32	36	<1	-31
Urban	n/a	n/a	34	34

Sources: CPRE (2007)

Notable trends from the 1960s to 2007 are the 31 per cent decrease in the area of undisturbed landscape and the 34 per cent increase in the area of urban landscape. This shows how the towns of the Sefton Coast have developed, particularly since the 1990s.

- More information is available at the following address: **www.cpre.org.uk/campaigns/planning/intrusion/our-intrusion-map-explained**

Pine plantations.

12. Data sources

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

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

Supporting document 2: Landscape change

Recent changes and trends

Trees and woodlands

- The work of the Sefton Coast Management Scheme led to the development of the Sefton Coast Woodlands Forest Plan in partnership with The Mersey Forest. The plan was adopted in 2003 and sets out detailed prescriptions for woodland management over a first five-year period set within an overall 20-year framework. The Sefton Coast Woodlands management plan has been revised for the period 2013–2032.

- Some areas of pinewoods closest to the sea have been removed in order to restore the original coastal dune habitats. The present woodland habitat is being restructured and diversified through silvicultural management aimed at creating a 'healthy' or normal woodland age profile.

Boundary features

- The estimated boundary length for the area is about 303 km. In 2011 the lengths of boundaries under Environmental Stewardship were ditches (0.4 km) and hedgerows (4 km). The extent of active boundary management is very limited.

Agriculture

- There has been a decrease of holdings in arable and horticulture from 16 in 2000 to 10 in 2009. There has also been a decrease in the overall number of holdings during the same period, from 34 in 2000 to 30 in 2009. Cattle are the predominant agricultural livestock; however between 2000 and 2009, there was a drop in cattle numbers by around 60 per cent (approximately 1,150 cattle in 2000; 500 in 2009).

Settlement and development

- Rates of development change to urban and urban fringe areas are low and 75 per cent of the area is within a greenbelt. Southport is undergoing a process of regeneration, with new investment in the coastal zone.

Semi-natural habitat

- The former uninterrupted expanse of coastal sand dunes has become fragmented over time by roads, railways, pine plantations and housing development. There is also fragmentation at the more local scale, for example, where colonies of sand lizard are divided.

- The Site of Special Scientific Interest (SSSI) area is significant. Much of the foreshore and some coastal sand dune habitats are in favourable condition or recovering. Some of the coastal dune habitats are in unfavourable condition.

- Ongoing coastal change is leading to both losses and gains in habitats. New habitat is forming at Southport and Birkdale, with the foreshore between Birkdale and Ainsdale developing a long strip of habitats. The 'Birkdale Green Beach' is a 4 km long stretch of salt marsh, sand dune, dune slack and swamp communities up to 200 m wide that has developed over the last 20 years on the foreshore between Birkdale and Ainsdale. At Formby the mobile dunes are migrating landwards in response to coastal erosion, resulting in the loss of dune habitats.

Historic features

- Few if any historic farm buildings have been converted and most are intact structurally. In 1918 about 2 per cent of the area was historic parkland. By 1995 it was estimated that 25 per cent of the 1918 area had been lost, while about 38 per cent of the remaining parkland was covered by a Historic Parkland Grant.

Coast and rivers

- Water quality in the Alt Crossens catchment is showing signs of improvement. In a 2005 fisheries survey, three small sea trout were found in the River Alt.[4]

- The River Alt has been reconnected to its flood plain in Lunt Meadows by Lunt village, upstream in the Merseyside Conurbation NCA. This scheme is designed for the control of water levels and to facilitate water storage in times of flood; and the reduction of pollution in the River Alt. The scheme will also create and restore habitats including reedbeds, flood plain grazing marsh and grassland along the River Alt.

- While some areas of the coastline are accreting, others are being eroded. The coastline at Southport and Birkdale continues to accrete, with increasing coastal salt marsh and dune development and rising beach levels. While this natural development gives rise to concerns at Southport from a tourism and amenity perspective, the accretion is providing an additional level of coastal protection. At Formby Point erosion predominates (with sand being moved both southwards and northwards) and the current policy is to allow the dune crest to 'roll back' in response to erosion thus maintaining a high dune barrier offering continued protection to the community of Formby. The Hightown Frontage is eroding.

- In 2009 Sefton was successful in becoming one of 15 local authorities selected as 'Pathfinders' to explore new approaches to planning for and managing adaptation to coastal change together with their communities.

Minerals

- Much of the landscape of the southern part of Formby Point has been modified by sand extraction. The scale of the operation led to concerns in the 1950s about the risk of marine flooding. Commercial sand extraction in Formby dunes continued until 1970. Sand extraction continued elsewhere on the coast, but was stopped first at Ainsdale, and then at Southport in the early 2000s.

- Oil and gas reserves in Liverpool Bay, offshore from the Sefton Coast are being utilised.

[4] River Basin Management Plan, North West River Basin District, Environment Agency (December 2009; URL: http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/genw0910bsrg-e-e.pdf)

View over Liverpool Bay from Formby beach.

Drivers of change

Climate change

- The Sefton Coast Adaptation Study[5] considered the potential impacts of coastal change including climate change on the Sefton Coast. This study identified risks and opportunities arising from coastal change (including those driven by climate change). The Sefton Coast and its habitats are vulnerable to climate change, in particular sea level rise. The key identified risk area was the fixed sand dune habitat around Formby Point.

- Warmer, wetter winters and hotter, drier summers are likely to see changes in ground water levels and changes in the viability of habitats on this coast. Several habitats and species on the Sefton Coast are dependent on natural fluctuations in water levels and water quality. The natural groundwater reservoir is an essential element of the coastal sand dune ecosystem.

- 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 is a natural response to rising sea levels, which will alter the sand stability, dune mobility and groundwater levels and alter the ecology. Species assemblages may change, affecting bird and mammal food sources. Sea level rise could lead to an increase in saline conditions.

- Mudflats and salt marshes within the estuaries are sensitive to increased tidal flooding as a result of rising sea levels and increased wave energy from higher storm surges. Salt marshes are sensitive to accelerated erosion of seaward marsh edge and to changes in internal creek patterns which could affect internal erosion and sediment transport within the salt marsh.

- Much of the Alt flood plain to the east is below sea level. The pumping stations provide a key aspect of flood risk management to a large area of Sefton. Pumping stations will need to cope with changing rainfall patterns and pumping out against higher sea levels.

- The Sefton Coast Woodlands were the focus of the Fore StClim Interreg project. As a result, the Mersey Forest is 'climate twinned' with community forest partners, Pays de Redon, in north-west France. This allows us to consider how we may modify tree and woodland management for a changing climate.

The 'green beach' at Birkdale.

[5] Coastal Adaptation Study http://modgov.sefton.gov.uk/moderngov/documents/s14205/01%202011%20Coast%20Adaptation.pdf

Other key drivers

- The continuing coastal erosion at Formby Point is leading to a squeeze on habitats. Over the next 100 years there is expected to be a loss of specialised habitat and the fragmentation of fixed dune habitats. The landward movement of habitats in response to coastal change is constrained by the inland residential areas and infrastructure. At Formby Point a number of landowners are considering their response to ongoing coast erosion. The National Trust is already making plans to relocate its main car-park and a new route has been found for the Sefton Coastal Path.

Herdwick sheep grazing at Ainsdale Sand Dunes National Nature Reserve.

- It will be important in the future to ensure the frontal dune habitats remain connected along the length of the Sefton Coast, both for the wildlife they support and the natural coastal protection they provide in response to erosion caused by the sea.

- The management of coastal sand dune systems, including taking into account the need to maintain the range of habitats and associated species reflecting the different stages of succession, by maintaining (or restoring where necessary) the natural processes and dynamics of dune development and succession. The increasing dune stability, resulting in the growth of rank vegetation, scrub/woodland development and introduced species is another threat to this habitat.

- The cumulative impact of use of the coast for settlement, recreation and transport – all these uses place pressures on the remaining natural habitats through actions such as water abstraction, drainage, trampling and disturbance.

- Many coastal areas are already a key tourism destination and have the potential to attract more visitors. The 2006 Climate Change and the Visitor Economy study[6] highlighted the challenge that climate change will bring for planning and management of some of the key 'green' visitor attractions. The study highlights that management of visitors, increasingly looking at outdoor activities to complement the shopping and cultural tourism attraction, will be required to direct them toward areas of greater resilience that can cope with both increased numbers of visitors and a changing climate.

[6] Climate Change and the Visitor Economy, 2006 (URL: http://www.sed.manchester.ac.uk/geography/staff/documents/CCVE_Summary_Report.pdf

- The quality of the bathing waters as well as the quality of place more generally may significantly affect how the tourism/visitor market develops.

- Green infrastructure approaches are being developed in Sefton, as part of the Liverpool City Region Green Infrastructure Framework.[7] This aims to maximise the benefits that the city region can gain from the sustainable management of its natural environment. In addition, Liverpool City Region Ecological Framework has been established and aims to reduce the loss of and / or fragmentation of important habitats.[8]

Way-marked paths in Sefton.

- The coast is an area with a high tidal range, prevailing westerly wind direction and higher than national average sunshine hours. This could lead to pressures for large- and small-scale renewable energy projects.

- Water management is complex in the Lower Alt and the Crossens pumped drainage catchment. Future ways to effectively and sustainably manage water levels in the catchment are being considered.

- The England Coast Path, a new National Trail around all of England's open coast, will for the first time give people the right of access around all of England's open coast, including – where appropriate – 'spreading room' along the way where they can rest, relax or admire the view.

- The developing network of Marine Protected Areas in Liverpool Bay may influence activity on the coastline.

- The Mersey Forest Plan[9] covers most 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 Dothistroma Needle Blight and ash dieback disease, which may impact upon wildlife, environmental quality and landscape.

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

[8] http://seftonmaps.sefton.gov.uk/EcoFramework/

[9] The Mersey Forest Plan (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.

Sunset over the Sefton Coast.

Statement of Environmental Opportunity	Ecosystem Service																		
	Food provision	Timber provision	Water availability	Genetic diversity	Biomass provision	Climate regulation	Regulating water quality	Regulating water flow	Regulating soil quality	Regulating soil erosion	Pollination	Pest regulation	Regulating coastal erosion	Sense of place / Inspiration	Sense of history	Tranquillity	Recreation	Biodiversity	Geodiversity
SEO 1: Adapt to and plan for coastal change, working with coastal processes and accepting the dynamic character of this lowland coastline with its long wide arc of sandy beaches, muddy estuaries and coastal sand dune system, conserve semi-natural habitats and reduce fragmentation.	O **	↘ **	↔ **	n/a	↔ **	↗ **	↔ **	↔ **	↗ **	↗ **	O **	O **	↑ ***	↗ **	O **	↗ **	↔ **	↑ **	↗ **
SEO 2: Promote sense of place by conserving and managing the coastal towns and villages while providing good green infrastructure links and interpreting Sefton's geology, archaeology and history to enhance people's enjoyment of the historic environment.	↔ **	↗ **	↔ **	n/a	↔ **	↗ **	↗ **	↗ **	↔ **	↗ **	O **	O **	↗ **	↑ ***	↑ ***	↗ **	↗ **	↗ **	↑ ***
SEO 3: Enhance people's understanding and appreciation of the Sefton Coast's natural environment, celebrating nature and wildlife, providing opportunities for recreation and access, as well as areas of tranquillity, as a source of inspiration, enjoyment and learning for the health and wellbeing of local people and visitors while retaining and enhancing the features of nature conservation interest.	↔ **	↔ **	↔ **	n/a	↔ **	↔ **	↔ **	↔ **	↔ **	↔ **	↔ **	↔ **	↔ **	↑ ***	↑ ***	↗ **	↗ ***	↑ ***	↗ **
SEO 4: Promote the sustainable use of the terrestrial and marine resources of the Sefton Coast, working with landowners and managers to improve biodiversity, improve water quality and supply, sustainably address flood risk management and contribute to landscape character.	↗ **	↗ **	↗ **	n/a	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↗ **	↔ **	↔ **	↔ **	↗ **	↗ **

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

National Importance; Regional Importance; Local Importance

Landscape attributes

Landscape attribute	Justification for selection
Sedimentary coastline, with wide gently sloping beaches, estuaries and coastal sand dunes, coastal dune heathland, conifer plantations and settlements backed by farmland; low-lying, rising in places to 20 m above sea level.	■ Extensive sandy and muddy/sandy beaches along the coast. ■ The coastal sand dune complex extends for more than 17 km with an average width of about 1.5 km. ■ Series of popular coastal resorts including Southport, Formby, Ainsdale and Hightown. ■ High amenity value of coastal strip.
Underlying soft sandstones and mudstones of Triassic age are almost entirely masked by thick deposits of glacial and more recent drift.	■ Thick and variable glacial and post-glacial drift deposits mask a low-relief surface of Triassic sandstones and mudstones that are rarely exposed. ■ Drift cover has infilled local irregularities in the bedrock surface, creating a generally flat landscape that mirrors the underlying low bedrock relief. ■ Minor relief variations reflect the dominant landforms associated with individual drift types and their modes of origin rather than the underlying solid geology.
A dynamic coastal landscape affected by the movements of the sea and wind; the estuary and dune systems are subject to ongoing change.	■ Physical processes, such as tides, wind, the sorting of particles and long-shore drift maintain a 'dynamic' environment on which is based the vegetation communities of the coastal sand dunes and coastal salt marshes and their associated animals and plants. ■ Dunes of recent wind-blown sand are the predominant feature along much of the coast. ■ Processes maintain the diversity of habitats. Some develop in windswept, mobile, conditions, whereas others require deposition of silts. ■ Ongoing coastal change is leading to losses and gains in habitats. ■ The rise and fall of the water table also determines soil character and vegetation.
Inland, the low-lying hinterland is pumped to drain the land for agriculture and to provide flood protection for urban areas such as Southport.	■ The River Alt rises in the urban area of Huyton, east of Liverpool, and flows into the Irish Sea at Hightown, south of Formby. ■ The hydrology of the area is complex because much of the catchment is at or below sea level. ■ In the hinterland, large areas of standing water remained for much of the year until large areas were drained and claimed for agriculture in the 18th and 19th centuries. ■ This area is extensively pumped to drain the land for agriculture and to provide flood protection for urban areas. ■ The two main pumping stations of Altmouth and Crossens evacuate water from the Alt and Crossens catchments respectively.

Landscape attribute	Justification for selection
Large conifer plantations (housing a colony of red squirrels) around Formby and Ainsdale, with pockets of wind-sculpted deciduous woodland on estates and farmsteads.	■ Woodland pockets and copses are found mostly to the south around the parkland and former parkland at Ince Blundell, Little Crosby, as well as at Churchtown in the north-east. ■ Trees and woodlands also accompany the golf courses and the rifle range in the area. ■ Large coniferous woodlands, established in the Formby and Ainsdale area in the late 19th and early 20th century. ■ The conifer plantations are now home to an important colony of red squirrel. Red squirrel populations also occur in the woodlands of the hinterland and the area is noted as a red squirrel stronghold. ■ The Mersey Forest covers much of the area. ■ The coastal area includes areas of low tree cover, such as the Alt flood plain, the coastal sand dunes and coastal dune heathland, and the Ribble Estuary and coastal and flood plain grazing marshes.
A mixture of agriculture, ranging from open grazed marshes, areas of reclaimed pasture and enclosed fields supporting dairy or beef cattle and some arable farming.	■ Inland from the coast is a low-lying hinterland of high-quality agricultural land. ■ The ordered agricultural landscapes contrast with the wilder and more dynamic landscapes associated with the coast. ■ Some of the fields of the coastal hinterland are used by wildfowl and waders for roosting and feeding. Agricultural land also supports some breeding populations of farmland birds, especially lapwing. ■ Asparagus farming was a major land use in the 19th century. A unique aspect is the surviving pattern of small fields created by the former growing of asparagus on sandy soils.
Field boundaries include hedgerows, ditches, post-and-wire fencing and embankments.	■ In places the fields are hedged, but often they are defined by ditches, embankments or wire fences.
An extensive coast with internationally, nationally and locally recognised wildlife and geological sites including intertidal mudflats and sand flats, coastal salt marsh, embryonic shifting dunes, mobile dunes, dunes with creeping willow, humid dune slacks, fixed dunes, dune grasslands and dune heathland; the significant dune system is one of the largest in England.	■ Much of the coastline and estuaries are internationally designated for their conservation importance as wildlife habitat and make a very significant contribution to the coastal landscape. ■ The Sefton Coast Special Area of Conservation (SAC) is internationally important for the sand dune complexes with all types of dune habitats. ■ The Ribble and Alt Estuaries Ramsar site and Special Protection Area (SPA) are internationally important for a wide range of birds and other wetland species. ■ There are significant populations of many internationally, nationally and regionally important species including natterjack toad, sand lizard, great crested newt; assemblages of vascular and non-vascular plants, including dune helleborine and a liverwort known as petalwort; a rich invertebrate fauna including the sandhill rustic moth.

Landscape attribute	Justification for selection
Evidence of human activity goes back to the Mesolithic period, but settlement was sparse until the 19th century; development is primarily of Victorian date or later, orientated as a line of tourist/commuter towns and villages along the coastal railway and road.	■ Evidence of prehistoric settlement, with human and animal footprints and artefacts in the intertidal Holocene deposits on the Formby and Hightown foreshores. ■ The introduction of the railway in the 1840s brought about a string of coastal resorts. ■ Sea bathing became increasingly fashionable in the 18th century, leading to the development of resorts such as Southport and Ainsdale. ■ Built heritage includes the promenade at Southport and Southport Pier. ■ In all of the coastal resorts extensive areas of modern housing now surround the older Victorian core.
Coastal recreation facilities arise from the seaside tourist attractions, beach access, public rights of way and the coastal footpath; chalet/caravan sites and several golf courses introduce a manicured appearance into this varied coastline.	■ The resort town of Southport and seafront contains traditional seaside tourist attractions such as the pier, funfair and gardens. The Marine Lake is also a feature, and is used for watersports. ■ Caravan sites at Southport, Ainsdale and Formby and Pontins Holiday Village at Ainsdale. ■ Several golf courses were established on dune land in the last century. The 'links' character of these courses is renowned. ■ Coastal area is served by a network of footpaths.

Marshside Nature Reserve.

Landscape opportunities

- Allow for the continuing dynamic coastal processes, and protect the range of coastal and estuarine habitats that contribute to landscape character and support the wide range of wildlife.
- Plan for coastal change through enabling intertidal habitats to develop and ensuring that they are established so that they enhance biodiversity and strengthen landscape character.
- Ensure effective management of coastal landscapes including mobile and fixed coastal sand dunes, coastal salt marsh and coastal dune heathland.
- Maintain the population of red squirrel by undertaking sensitive woodland management. Looking for opportunities for woodland creation including wet woodland, in appropriate locations within green infrastructure in and around urban areas to deliver multiple benefits, while protecting sensitive habitats.
- Maintain and enhance the boundary features, for example, by sensitively managing hedgerows.
- Conserve wetland habitats, including reedbeds, ditches and ponds, as part of the overall mosaic of the Sefton Coast habitats. Ditch management should consider the presence of water vole. Create wetland features (ditches, ponds and reedbeds) adjacent to the main coastal sites on farmland and on golf courses.
- Protect ponds, dune slacks and other water bodies, particularly in respect of amphibians such as natterjack toad and great crested newt.
- Provide habitat that will benefit passage, overwintering and breeding birds, especially coastal and estuarine habitats and coastal farmland.
- Seek opportunities to improve access, especially through the future development of the England Coastal Path National Trail, so that people can enjoy the natural coast, with its abundant wildlife. Support the England Coast Path to ensure that no sensitive features found on and along the coast are impacted.
- Encourage developers to incorporate green infrastructure, and design residential and infrastructure development and their settings that strengthen character of the area and are sensitive to the environment.
- Maintain the wide open and distant views of the seascape along the coast and out to sea afforded by dune summits and open beaches.

Ecosystem service analysis

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Food provision	Agricultural land Soils Grasslands and grazing marsh Tidal waters and intertidal habitats supporting shellfish populations	9 per cent (as a proportion of the total land area) is Grade 1 agricultural land (837 ha), with another 16 per cent Grade 2 (1,470 ha), giving rise to productive cropping, including horticultural produce. Holdings are predominantly split between general cropping (33 per cent of the total farmed area), lowland grazing livestock, mainly cattle (17 per cent) and 'other' types (30 per cent) ('other' includes horse grazing). There are also low numbers of cereal, horticulture and specialist pig holdings. A complex land drainage network has been created in the coastal hinterland to support agricultural production. Some agricultural land is extensively used by wildfowl and waders for roosting and feeding. The very sandy soils along the coast are internationally and nationally recognised as important nature conservation sites and tend to be in non-agricultural uses. Grazing is used for habitat management in some areas. Around Formby, the sandy soils suit a small area of very specialist production of asparagus. A number of commercial fisheries operate within Liverpool Bay.	Regional	Agriculture is an important element of land management. Potential for increasing food production is likely to be limited, with issues around land drainage and soil erosion. While intensive drainage provides short-term productivity benefits, the longer term impact on ground levels and associated drainage impairment will reduce the effectiveness of the drainage system and may reduce agricultural productivity overall. The expectation is that climate change will result in a greater variability in rainfall through the year, with wetter winters and drier summers predicted. This will place further challenges on the existing systems.[10] Agricultural practices in the hinterland can affect the nature and wildlife of the coast. In a climate of changing farming practices there may be opportunities to work with farmers to manage change, such as establishing wetland areas. The former growing of asparagus, which was cultivated in small fields or 'pieces' enclosed by fences of scrap timber and driftwood, has created a unique landscape. Common or brown shrimp are caught in a number of shallow waters, including in the Penfold Channel off Southport and in Formby Pool. The shrimp fisheries are carried out at different intensity, varying from trawls and push nets, to tractor-towed nets. When shrimps are out of season, cockles and mussels are sometimes gathered by hand, such as at Blundellsands and Formby. Inshore trawlers also take a variety of white fish from further offshore. Trawlers often fish off the Sefton Coast in the main white fishing grounds, north of Taylor's Bank, offshore from Ainsdale.	Work with the farming community to encourage sustainable agricultural practice, while delivering other benefits such as maintaining soil and water quality, managing flood risk, providing habitats for wildlife and recreational benefits. Encourage agricultural practices that reduce diffuse pollution and eutrophication. Interpret long established land uses such as asparagus farming. Work with the local fishing community to promote sustainable fishing practices. Promote sensitive bait digging and shellfish gathering practices to maintain sustainable fisheries, while minimising disturbance to important waterfowl populations.	**Food provision** **Water availability** **Regulating water quality** **Regulating water flow** **Regulating soil quality** **Regulating soil erosion** **Sense of history** **Biodiversity**

[10] Lower Alt with Crossens Pumped Drainage Catchment Draft Flood Risk Management Strategic Plan: Consultation Document, Environment Agency

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Timber provision	Woodland cover Plantation woodland Mersey Community Forest	Woodland cover is nearly 8 per cent of the NCA including 262 ha broadleaf woodland, 307 ha coniferous woodland, 47 ha mixed woodland. There are large conifer plantations around Formby. Plantation woodland was introduced into the landscape by local estate owners from the 18th century. The main woodland species is Corsican pine. The Mersey Community Forest covers 90 per cent of the area.	Local	The conifer plantations are similar in age, so that they are now all moving simultaneously towards the end of their lifespan. They provide habitat for red squirrel, so that their renewal needs to be carefully managed. Continued coastal sand dune erosion at Formby Point is occurring. The natural landward movement of habitats in response to coastal change is constrained. Wind and sand blow affect the woodland edge along the coast. Some open areas are important for pink-footed goose feeding. This limits potential for increased timber production. Sefton Coast Woodlands Forest Plan sets out to take a joined-up approach to the management of the areas woodlands, including sustainable management of the woodlands, red squirrel conservation and supporting recreation and tourism. The woodlands have generated sustainable wood products and provide training opportunities.	Encourage the appropriate management of woodland, diversifying age structure of woodlands, to provide multiple benefits including timber provision, red squirrel conservation and recreation.	**Timber provision** **Biomass energy** **Sense of place/ inspiration** **Sense of history** **Recreation** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Water availability	Semi-natural habitats Rivers Alt and Crossens Rainfall Dune aquifer	The Alt Crossens catchment drains low-lying land between the Ribble and Mersey estuaries. Within the Crossens area, the majority of surface water and some of the groundwater abstraction are for agriculture.[11] The Crossens supports a coarse fishery. Water is abstracted in the Alt catchment from both surface and groundwater sources, for a variety of purposes including public and private water supply, spray irrigation, industry and golf courses.[12] The Alt and Crossens catchments also support a population of water vole. The sand dunes are a minor aquifer and dune water level is dependent on rainfall. There are some abstractions from the dune aquifer, for example for the golf courses. The natural groundwater reservoir is an essential element of the dune ecosystem, with several habitats and species dependant on natural fluctuations in water levels.	Local	The network of pumping stations manages land drainage for agriculture while maintaining higher water levels during summer months to provide water for irrigation of the agricultural crops grown in the area. Climate change predictions show that pressure on water resources is likely to increase in the future. The dune water table can be reduced by abstraction, drainage, coastal erosion, and trees and shrubs which intercept a proportion of the rainfall. Water quality, quantity and seasonal fluctuations are all important in maintaining habitats such as dune slacks. Natural fluctuation in the dune water table contributes to dynamic dune processes such as the formation of blow outs and wet slacks. In the long-term climate change may result in a lowering of the water table and this would have implications for the current dune slack system.	Ensure the land drainage network is managed in an environmentally sustainable manner. Work with farmers and land managers to manage demand for water, promoting the sustainable use of water in terms of water use and water conservation. Seek opportunities to create water storage areas, which will also increase semi-natural habitats. Encourage farmers to use best practice in soil management, in order to increase infiltration rates and water-holding capacity and slow run off using techniques such as minimum tillage and controlled farm traffic to protect soil structure. Ensure that plans are in place to adapt water supply systems to expected climate change. Maintain the natural functioning of the dune aquifer to support characteristic sand dune habitats. Monitor water levels in the dune system to improve understanding of the dune aquifer and the effects of water abstraction. Protect groundwater levels in sensitive areas by controlling and monitoring abstraction licences. Work with land managers to find ways of managing demand for abstraction.	**Water availability** **Food provision** **Regulating water quality** **Regulating water flow** **Biodiversity**

[11] Ribble, Douglas and Crossens abstraction licensing strategy, Environment Agency (February 2013; URL: http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/LIT7919v3_f881c4.pdf)

[12] Lower Mersey and Alt abstraction licensing strategy, Environment Agency (February 2013; URL: http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/LIT_7881_35d3ed.pdf)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Genetic diversity	N/A	N/A	N/A	N/A	N/A	**N/A**
Biomass energy	Woodland cover	Woodland cover is nearly 8 per cent of the NCA including 262 ha broadleaf woodland, 307 ha coniferous woodland, and 47 ha mixed woodland. There are four woodfuel boilers and one woodfuel supplier in the area. The NCA has predominantly medium potential yield for short rotation coppice, although it is low at Formby Point, while potential miscanthus yield is high. For information on the potential landscape impacts of biomass plantings within the NCA, refer to the tables on the Natural England website.	Local	In this NCA the existing woodland cover offers some potential for the provision of biomass through bringing unmanaged woodland under management. Some scrub management takes place to conserve coastal sand dune habitats. More productive uses for scrub could be found, for example as biomass fuel in heating systems. Some open areas are important for pink-footed goose feeding. Given that short rotation coppice and miscanthus crops occupy land over the winter period, they could have a displacement effect if the land previously supported use by overwintering Special Protection Area (SPA) birds. In this low-lying flat landscape, generally expansive and open, where urban resorts contrast with the relatively wild natural areas, the mosaic of land uses are all generally unsuited to anything other than very small-scale biomass planting. The strong horizontal nature of the landscape could help to accommodate miscanthus planting but short rotation coppice would be very alien in this sparsely wooded landscape.	Explore opportunities for management of woodlands and scrub to produce surplus timber and biomass for local use, such as wood-fired boilers provide woody biomass, where this is consistent with nature conservation and landscape character objectives.	**Biomass energy** **Timber provision** **Climate regulation** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Climate regulation	Soils Woodland	Soils with a high (or potentially high) peat or organic content include naturally wet very acid sandy and loamy soils (46 per cent of NCA); sand dune soils, (28 per cent); fen peat soils (7 per cent); and raised bog peat soils (6 per cent). Some of the highest carbon levels are likely to be associated with the coastal marsh and lowland heathland habitats where soils remain undisturbed. Carbon storage is also provided by the 8 per cent cover of woodland.	Local	Soil carbon levels are predominantly high (20–50 per cent), as 98 per cent of the area is covered by soils with a high (or potentially high) peat or organic content. Naturally wet very acid sandy and loamy soils are mostly organic topsoils which are a store of carbon. Fen peat soils and raised bog peat soils are also important stores of carbon. The immediate hinterland of the coast is the West Lancashire mosslands, containing rich peaty soils, which are vulnerable to erosion. The drainage and cultivation of peat soils can lead to peat shrinkage and wastage thereby contributing to the loss of a valuable soil carbon store.	Conserve soils that sequester and store carbon. Consider scope for maintenance of carbon stores through actions such as reducing cultivation, land use change to pastures, meadows and permanent grassland, and managing water levels to raise them. Maintain, restore and create coastal and flood plain grazing marsh, increase areas of permanent grassland and allow inundation of grassland in flood plains where this is feasible.	**Climate regulation** **Regulating coastal erosion and flooding** **Biodiversity** **Regulating soil quality** **Regulating water flow** **Regulating water quality**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water quality	Soils Bathing waters Nitrate vulnerable zone Dune aquifer	The Alt Crossens catchment includes 14 water bodies. One is at good quality, 12 are moderate and one is poor. There are 3 designated bathing waters in this catchment; two are predicted to fail the minimum standards required for bathing.[13] The Alt and Crossens catchment has moderate to high levels of phosphate. Although pesticides are not currently tested for in the catchment, several of the stretches of rivers have poor ecological and chemical status as well as low invertebrate numbers which suggest a potential pesticide issue. 37 per cent of the NCA is nitrate vulnerable zone. The Alt and Crossens catchment has been designated as a nitrate vulnerable zone since 2002. The Alt and Crossens Catchment Sensitive Farming (CSF) catchment was designated in 2012 and amalgamated into the wider Ribble catchment in 2014.	Local	Water quality in the Alt is affected by historical contamination with heavy metals and chemicals from past industry and contaminated land. The source and upper part of the River Alt is within a culvert under housing development on the outskirts of Liverpool in the Merseyside Conurbation NCA. Historically, many of the houses within these estates have had their waste water wrongly connected into the surface water drainage resulting in waste water flows directly into the river. Water quality test sites located at on the coast at Formby, Ainsdale and Southport detected faecal indicator organisms which are thought to be related to the sewage treatment works and septic tanks and not from agriculture.[14] Bathing water quality is a major concern for many key tourist locations including Southport. Biodiversity and fisheries also depend upon good water quality. There is a risk that silt can build up in water courses, which can lead to reduced oxygen concentrations in the water and can also increase the risk of flooding. The low nutrient status of the water in the dune aquifer is important for the conservation of the characteristic dune slacks at the coast.	Identify and resolve wrong sewerage connections, failing septic tanks and landfill leachate. Work with water companies to reduce the level of nutrients and other pollutants discharged into watercourses and the sea from wastewater treatment works. Raise awareness of and explore the role of natural habitats in water treatment, either through formal sites planted with reedbeds, or the use of greenspace within urban areas to absorb run-off from roads and hard infrastructure. Improve water quality in rivers by reducing pesticide losses during sprayer loading and wash down, matching nutrient inputs to needs as far as possible, and reducing nitrates entering watercourses by establishing buffers of permanent grassland or scrub alongside watercourses. Protect and enhance groundwater quality in the dune aquifer for example through preventing water pollution.	**Regulating water quality** **Food provision** **Water availability** **Regulating water flow** **Recreation** **Biodiversity**

[13] North West River Basin District: Challenges and choices: Summary of significant water management issues, Environment Agency (2013)

[14] Alt Crossens Catchment Summary (CSF027), Natural England (June 2013; URL: http://publications.naturalengland.org.uk/publication/10379005)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating water flow	Semi-natural habitats Coastal processes	The Alt Crossens area is low lying, with considerable areas of high grade farmland and urban areas. The hydrology of the area is complex because much of the catchment is at or below sea level. Inland the area has been extensively developed for agricultural use and a large network of modified watercourses and embanked rivers has been created to support agricultural production. The modified channels act as arterial flow routes to a network of 11 satellite pumping stations and the two main pumping stations.[15] Heavy reliance is placed upon the two main pumping stations of Altmouth and Crossens to evacuate water from the Alt and Crossens catchments respectively and protect the area from flooding. There is no capacity for gravity drainage from the Crossens catchment, although within the Alt catchment, there is some scope for gravity drainage during low tide at Altmouth.	Local	Land drainage in the Alt Crossens catchment is largely managed through artificial means, with substantial intervention to manage water levels. If the network of culverted watercourses fails or becomes blocked during periods of peak flow, there is still a potential risk of fluvial flooding to Southport and Formby and surrounding agricultural land. Climate change may increase the risk, with higher winter rainfall, intense rainfall events, extreme storms and sea level rise predicted. Pumping stations will need to cope with changing rainfall patterns and pumping out against higher sea levels. Flood storage may sustainably provide flood risk benefit and opportunities for habitat creation or enhancement. In Sefton, green infrastructure has been identified as an opportunity to help reduce flood risk. Sustainable drainage in developments, increasing semi-natural habitats and using permeable surfacing can reduce run-off, increase water filtration and slow water entering the system. Some river restoration projects are being delivered to manage flooding and provide other environmental benefits. At Lunt Meadows next to the Alt north of Liverpool (upstream in the Merseyside Conurbation NCA) wetland habitat is being created on arable farmland including reedbeds, flood plain grazing marsh and hay meadows, providing flood storage.	Recognise and understand the complexity of the drainage and interconnections. Work with land managers to enhance fluvial flood plains by considering ways to sustainably manage water in the catchment. Identify opportunities to re-naturalise drainage as well as expanding or creating flood storage in relevant areas to manage flood risk, while supporting habitat enhancement for wildlife and reducing carbon emissions. Explore opportunities to expand or establish wetland habitats such as wet pastures and grazing marsh to provide for flood water storage and provide other environmental benefits. Seek opportunities to promote green infrastructure in urban areas to provide multiple benefits including reducing flood risk. Ensure that new developments incorporate sustainable urban drainage systems and rainwater harvesting and do not exacerbate flooding events by incorporating impermeable surfaces.	**Regulating water flow** **Food provision** **Water availability** **Regulating water quality** **Regulating coastal erosion and flooding** **Biodiversity**

[15] Alt Crossens Catchment Flood Management Plan: Summary Report, Environment Agency (December 2009; URL: www.environment-agency.gov.uk/static/documents/Alt_Crossens_CFMP.pdf)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil quality	Geology Soils	This NCA has nine main soilscape types: ■ Naturally wet very acid sandy and loamy soils, covering 46 per cent of the NCA. ■ Sand dune soils (28 per cent). ■ Fen peat soils (7 per cent). ■ Raised bog peat soils (5 per cent). ■ Loamy and clayey soils of coastal flats with naturally high groundwater (4 per cent) ■ Loamy and sandy soils with naturally high groundwater and a peaty surface (3 per cent). ■ Loamy and clayey flood plain soils with naturally high groundwater (3 per cent). ■ Salt marsh soils (2 per cent). ■ Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (2 per cent).	Local	The naturally wet very acid sandy and loamy soils (46 per cent) can have a weak structure but are easily worked. Topsoil compaction can occur as well as cultivation pans. With the sand dune soils (28 per cent), blown sand can be a source of deposited material. The soil system is an essential component of the coastal environment. In the sand dune soils nutrient enrichment can impact upon habitats. Fen peat soils are at high risk of loss of peat through wastage with peaty layers becoming thinner over underlying mineral layers reducing long term agricultural value; at some locations mineral material is within plough depth. Wastage also exposes 'bog oaks'. Where over marine alluvium, drained soils may be extremely acid impacting on land use and management. Erosion and redeposition processes in coastal salt marshes are necessary to maintain a succession of diverse habitats. Salt marsh soils protect inland soils from saline intrusion and change in character due to increased wetness/flooding associated with sea level rise.	Improve understanding of coastal soils and their future evolution and the link between soils and the characteristic dune vegetation. Encourage agricultural practices which enhance and maintain soil structure and organic matter. Encourage carefully timed activities such as avoiding use of farm machinery, during very wet periods and extensive grazing regimes to reduce soil compaction. Encourage research to improve understanding of soil changes that may take place in the event of sea level rise and subsequent impact on land use and movement of the salt marsh system.	**Regulating soil quality** **Food provision** **Climate regulation** **Recreation** **Biodiversity** **Regulating water quality**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating soil erosion	Soils Coastal habitats	Most of the soils covering this NCA (91 per cent) are susceptible to erosion including the naturally wet very acid sandy and loamy soils (46 per cent), sand dune soils (28 per cent), salt marsh soils (2 per cent), raised bog peat soils (5 per cent), fen peat soils (7 per cent) and loamy and sandy soils with naturally high groundwater and a peaty surface (3 per cent).	Regional	Some of the naturally wet very acid sandy and loamy soils are easily eroded if heavily trafficked or after heavy rainfall. They are light soils which are also at risk of wind erosion. Sand dune soils are characteristically very susceptible to drought and unstable. Erosion and redeposition processes in dunes are necessary to maintain a succession of diverse habitats. Younger less vegetated dunes constantly change shape. Coastal salt marsh can dissipate wave energy and reduce the level of flooding. The raised bog peat soils and fen peat soils are permeable and therefore have a generally low risk of water erosion, except where cultivated land is susceptible to flooding. But there is a risk of wind erosion in these soils, as there is in the loamy and sandy soils with naturally high groundwater and a peaty surface, especially where surfaces are bare or spring crops are grown. Any loss of, or damage to, soils is likely to have knock-on impacts on habitats and on other services such as farming and carbon storage.	Enable natural movement and succession of sand dune soils and habitats by ensuring the sediment supply is unimpeded, avoiding insensitive developments and finding ways to remove barriers to dune movement. Consider whether changes in management to protect sand dune soils are desirable, such as in locations where visitor management and erosion is a critical issue. Encourage research to improve understanding of soil changes that will take place in the event of sea water rise/flooding and subsequent impact on land use and inland movement of the salt marsh system. Within farmed areas encourage practices that will retain cover on vulnerable sandy and peaty soils, such as overwintering stubbles, or reverting land to permanent grassland.	**Regulating soil erosion** **Food provision** **Climate regulation** **Regulating soil quality** **Regulating coastal erosion and flooding** **Biodiversity** **Geodiversity** **Sense of place/ inspiration**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Pollination	Horticulture Semi-natural habitats Gardens	The NCA's coastal dune heathland and dune grassland provide some good quality habitat to support pollinating insects, as do the gardens within the urban areas.	Local	Habitat for pollinators could be improved in this area through provision of nectar-rich habitats in intensive arable areas (such as pollen and nectar mix areas and flower-rich grassland through agri-environment schemes). Urban areas could also be managed for the benefit of pollinators, by using nectar-rich plant varieties in municipal planting schemes, encouraging home-owners to grow nectar-rich plants and encouraging use of nectar-rich plants in planting schemes and green roofs within new developments.	Protect areas of semi-natural habitats. Establish species-rich grass margins to fields within the farmed areas, and link to permanent grassland strips alongside water courses to create a network of nectar-rich habitat to support pollinating insects. Encourage use of nectar-rich plant varieties in municipal planting schemes, private gardens and new development.	**Pollination** **Food provision** **Biodiversity**
Pest regulation	Semi-natural habitats	The habitats in the area support a variety of species, such as beetles, which can regulate populations of pests such as aphids.	Local	There is some evidence to suggest that certain habitats can support populations of beneficial predator species which can help control common agricultural pests (for example, ladybirds can help control aphids). Habitats which provide a nectar source, shelter and additional prey species all have the potential to increase beneficial predator numbers. There are potential nectar sources from the semi-natural habitats, marginal riparian habitats along the rivers and drainage network. Where pest regulation services are provided by semi-natural habitats and associated species, this could reduce the need for pesticides, thereby affording benefits for water quality, soil quality and wider biodiversity.	Encourage sustainable farming practices to manage existing semi-natural habitats and create new areas of habitat; flood plain grazing marsh and riparian grassland along waterways, to provide a strong network of habitats to bring benefits for pest regulation as well as pollination, biodiversity and other services. Communicate any clear benefits of natural pest control to farmers and provide information on how to manage crops and adjacent land to maximise beneficial predator numbers.	**Pest regulation** **Food provision** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Regulating coastal erosion and flooding	Coastal processes Coastal habitats	Ongoing coastal change is leading to both losses and gains of habitats. New habitat is forming at Southport (coastal salt marsh) and Birkdale (coastal sand dunes and marshes). At Formby the mobile dunes are migrating landwards in response to coast erosion. A Shoreline Management Plan (SMP) has been prepared to determine local defence policies.[16] From Seaforth to the River Alt, the long term plan is to manage erosion risk to property and infrastructure if and when threatened by erosion but as far as possible allow natural processes to continue. Allowing the natural evolution of the Formby dunes area is the long-term plan, with minimal intervention if local problems occur, which may involve dune management or relocation of assets at risk. The long-term vision for the areas at the mouth of the Ribble Estuary and Southport is to continue to manage risks to the towns and their associated facilities, but achieving this as far as possible through maintaining the naturally functioning systems with minimal interventions. Within the Ribble Estuary the long-term plan is to establish a balance between protection of property, key infrastructure and industries, while creating more space where possible within the estuary systems. There is tidal flood risk in the Alt Crossens catchment. Flood defences in the form of raised embankments extend along parts of the coast. The pumping stations at Altmouth and Crossens also provide protection against tidal ingress into the network of heavily modified drainage channels.	Regional	Although the coastal frontage contains the large settlements of Formby and Southport, as well as smaller Hightown, much of the shoreline remains unprotected by defences, with structures concentrated at Southport. Allowing the natural evolution of much of the coastline is the long term plan, and as such, a policy of managed 'roll back' will allow the dune system to behave as naturally as possible, and adapt to coastal change. Coastal sand dunes provide a natural barrier to sea flooding. Movement of sand dunes is a natural phenomenon. Opportunities for dune 'roll back' could be impeded by coastal squeeze, coastal defences and the natural topography of the area. At Formby Point landowners are considering their response to ongoing coastal erosion. The National Trust is making plans to relocate its main car-park and a new route has been found for the Sefton Coastal Path. The recommended plan for the Ribble Estuary/Southport is for many existing flood defences to be maintained, but there are opportunities for managed realignment of present defence lines, which will be investigated. This could result in some loss of properties and agricultural land but this is balanced against reducing flood levels to larger communities and the need to provide compensatory natural habitats in the long term.	Plan for change at the coast, allowing natural coastal processes to function, ensuring the sediment supply is unimpeded. Allow beaches/intertidal habitats and the dune system to provide a natural and cost effective means of defence. Work with local landowners to find ways of adapting to coastal change and enabling 'roll back' of the dune system. Promote research towards gaining a deeper understanding of coastal sedimentary and erosion systems. Investigate opportunities for the managed realignment of present defence lines, working with local landowners to find suitable compensation areas and ensure that they are managed to support and enhance the biodiversity interest of the coast.	**Regulating coastal erosion and flooding** **Climate regulation** **Regulating soil erosion** **Biodiversity** **Geodiversity** **Regulating water quality** **Regulating water flow**

[16] North West England and North Wales Shoreline Management Plan SMP2, North West and North Wales Coastal Group (July 2010; URL: http://www.allerdale.gov.uk/downloads/nw_shoreline_management_plan-2.pdf)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Sense of place/ inspiration	Dynamic coastal landscapes Habitats and species	Sense of place is provided by the broad-scale, open, low-lying and distinctive coastal landscape of coastal sand dunes, coastal dune heathland, sandy beaches, intertidal mudflats and coastal salt marshes with areas of pine plantations. The coastal strip has a wealth of internationally important habitats. Many habitats provide important nesting and overwintering sites for birds, as well as nationally important populations of sand lizard, natterjack toad and red squirrel. Although likely to be constrained to some extent by extensive urban development along large stretches of coastline, senses of inspiration and escapism are still likely to be associated with the flat, low-lying land providing atmospheric views across the sea, mudflats, sand banks, dunes and inland across the Lancashire Plain.	Regional	Feelings of escapism and tranquillity are associated with quiet, undeveloped areas along some parts of the coast. Sefton's beaches and dunes convey a special sense of wilderness, with wide panoramic views, high mobile dunes and a maze of dune ridges and hollows. The Sefton Coast is rich in natural history. The area's vulnerability to climate change, its popularity and pressure for development and related infrastructure, present challenges. The coast makes a strong contribution to sense of place, and measures that help coastal habitats to 'roll back' as the coast changes and that facilitate coastal access and recreation while minimising disturbance or damage, will help to conserve sense of place. The ordered agricultural landscapes contrast with the wilder and more dynamic landscapes associated with the coast.	Maintain the senses of inspiration and escapism that are associated with the coastline such as the flat, low-lying land providing atmospheric views across the sea, mudflats, sand banks, dunes. Conserve and enhance the natural beauty and natural heritage of the coast, including its characteristic wildlife, natural processes, geomorphology, landscape and heritage features. Enhance people's understanding and appreciation of the Sefton Coast by extending opportunities for education. Develop links between the ordered inland and urban areas and the dynamic coast. Promote public understanding of the conservation of coastal habitats. Promote interpretation to help visitors and local people gain an improved awareness and understanding of the key nature conservation features within the area. Seek opportunities to work with the farming community by encouraging the maintenance and creation of habitats that contribute to the coastal hinterland.	**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
Sense of history	Coastal towns Four Registered Parks and Gardens Evidence of prehistoric settlement	Aspects of history likely to be particularly evident to the general public include the Victorian seaside town of Southport and county parks and gardens including Hesketh Park, King's Garden and South Marine Garden, Churchtown Botanic Gardens, as well as the parkland at Ince Blundell which includes pockets of woodland. At Formby Point, coastal erosion of the foreshore has revealed the footprints of humans, animals and wading birds preserved in laminated silts dated to a period some 7,000–5,000 years ago. Early settlement was limited. Exceptions include a number of Norman abbeys and chapels, reflecting the introduction of Christianity into the area, some ridge and furrow earthworks and other relict field systems, for instance to the eastern side of Formby, and small fishing hamlets forming the core to large settlements such as Formby and Hightown. More recent sites include the remains of Formby Lifeboat station, the original Formby promenade and military structures such as Second World War bunkers.	Local	The impact of 19th- and 20th-century development contributes to a dynamic coastline, with rich archaeological evidence and potential for human settlement and activity. The coast is a dynamic, rapidly changing environment within which archaeological remains can be exposed for a short period before being either reburied or destroyed by erosion. Archaeological sites along the coast are vulnerable to loss through coastal erosion. Archaeology enables insight into the processes of coastal change and its causes and reveals past human activity in the coastal area. Interpret the history and architecture of Southport.	Seek opportunities to manage and maintain historic and archaeological features. Where coastal processes reveal historic sites, encourage the capture and recording of historic and archaeological information for future study. Seek ways to protect, conserve, manage and interpret the area's historic and cultural identity to ensure a better understanding of past land use and retain evidence of the relationships between features for the future. Protect historic buildings and structures such as parkland features, Second World War structures and traditional buildings. Raise awareness and increase public engagement, enjoyment and understanding of the historic environment, especially linking to coastal change.	**Sense of history** **Regulating soil erosion** **Regulating coastal erosion and flooding** **Sense of place/ inspiration** **Tranquillity** **Biodiversity** **Geodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Tranquillity	Semi-natural habitats Wide expanses of coastline	Tranquillity has declined dramatically in the past 50 years, with the total area of the NCA classified as 'undisturbed' having decreased from just under 32 per cent in the 1960s to 0.13 per cent in 2007 (the tiny 'undisturbed' pocket remaining to the west of Hightown).	Local	Tranquillity is likely to be associated with intimate-scale sand dune systems contrasting with wide expanses of coastline with sea views punctuated by embankments and sea defences, and wild untouched intertidal mudflats and sand flats and salt marshes. Pressure on the landscape from visitors, noise, erosion, and disturbance can be a risk to some of the sensitive habitats and species. High number of visitors in honeypot areas or inappropriate behaviour by visitors can disturb the experience of others seeking relaxation and peaceful reflection. Military land at Altcar and at Woodvale leads to noise, aircraft and munitions disturbance. However these areas are also an opportunity for wildlife and habitats as other forms of human disturbance are restricted.	Protect the sense of remoteness, 'wildness' and tranquillity particularly along the coastline. anage recreation and access opportunities in a way that enables quiet enjoyment, while conserving habitats and species.	**Tranquillity** **Sense of place/ inspiration** **Recreation** **Biodiversity**

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Recreation	Three National Nature Reserves Two Local Nature Reserves Other wildlife sites 30 km rights of way network England Coast Path National Trail and the Trans Pennine Trail The Mersey Forest Golf courses Coastal habitats Wildlife	There is a limited rights of way network; however, the coastline, coastal resorts and historic towns offer recreation opportunities for local communities and visitors. There are a series of nature reserves along the coast, as well as the National Trust reserve at Formby, the Wildlife Trust for Lancashire, Manchester and North Merseyside's Freshfield Dune Heath, RSPB Marshside to the north of Southport Pier and the red squirrels are a popular attraction. Some have visitor centres/facilities. There are opportunities for recreation, including wildlife watching, volunteering and education and are well used. There are many access points to the beach.	Regional	There are a diverse range of recreational activities associated with this area, including the use of microlites, power boats and jet skis, particularly in estuarine locations, as well as facilities at Southport, chalet and caravan sites, and internationally renowned golf links. Recreational activities include also include water sports, sea bathing, kite flying, horse riding and dog walking. Some 9 per cent out of the 10 per cent of accessible land within this NCA is provided by National Nature Reserves and Local Nature Reserves. This is a key asset and there are opportunities provided by offering high-quality engagement with nature, along with interpretation at the nature reserves. There is increasing evidence that open spaces and nature can make a positive contribution to health and wellbeing. Volunteering plays an important role at many locations along the coast, providing multiple benefits for wildlife and for people. Recreation is supported by the area's rights of way. The condition of some paths and coastal squeeze may reduce adaptive capacity at some locations along the coast. Footpaths on sandy soil are particularly sensitive to erosion. A new National Trail, the England Coast Path, will for the first time give people the right of access around all of England's open coast, including – where appropriate – 'spreading room' along the way where they can rest, relax or admire the view. The Coastal Access scheme sets out the methodology for implementation of the England Coast Path and associated coastal margin, and includes details on how it will ensure there will be no impact on sensitive features found on and along the coast. Recreation can provide open/disturbed ground for annuals and invertebrates. However, in some instances recreation can cause disturbance to nesting and roosting birds. Green infrastructure provision in areas where there are recreational pressures on coastal habitats could help to provide alternative areas of recreational greenspace.	Manage recreation and access opportunities in ways that conserve the special qualities and features of the area. Provide opportunities for people to engage with nature at the series of nature reserves along the coast. Promote active involvement through a wide range of volunteering opportunities and other activities to benefit coastal management any provide other benefits such as improving health and wellbeing, social inclusion, learning and personal development. Provide opportunities for people to enjoy the natural values of the Sefton Coast, through walking, cycling and other quiet recreation, with interpretation provided to improve their understanding and enjoyment of the landscape and its wildlife. Support sustainable tourism activity which promotes the natural values of the coast. Monitor recreational and tourism use of the coast, such as information on total numbers, levels of erosion and damage, and conflict. Support the development of the England Coastal Path National Trail, so that more people can enjoy the natural coast, with its historic features and abundant wildlife, while ensuring that no sensitive features found on and along the coast are impacted. Plan and manage visitor access to coastal areas, so that visitor pressure does not result in damage to coastal habitats or species Providing green infrastructure as alternative areas of recreational greenspace particularly in areas where there are recreational pressures on coastal habitats.	**Recreation** **Regulating soil erosion** **Regulating coast erosion and flooding** **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
Biodiversity *Continued on next page*	Semi-natural habitats Designated sites Local Wildlife Sites Species	The NCA has a significant extent of priority habitats, notably coastal sand dunes, lowland dry acid grassland, coastal and flood plain grazing marsh, lowland meadows, purple moor grass and rush pasture, broadleaved mixed and yew woodland (broad habitat) and lowland heathland. The NCA contains one Special Area of Conservation (SAC), one Special Protection Area (SPA) and one Ramsar site, and 2,200 ha are nationally designated as SSSI. There are 29 Local Wildlife Sites, covering 25 per cent of the NCA. The Sefton Coast SAC is of international importance for intertidal mudflats and sand flats, embryonic shifting dunes, mobile dunes, dunes with creeping willow, humid dune slacks, fixed dunes, dune grasslands and dune heathland. Small areas of coastal salt marsh are also present. Its populations of sand lizard, natterjack toad and great-crested newt are also of special interest. The Ribble and Alt Estuaries Ramsar site and SPA are internationally important for a wide range of bird species and other wetland species. The estuarine habitats are of major importance as staging posts for migratory birds in spring and autumn.	International	The coastline has a rich diversity of fauna and flora. Many of the habitats are vulnerable to the impacts of climate change, such as lowering of the water table, and changes in the shoreline position. The extent and connectivity of habitats on the Sefton Coast has been significantly altered by the consequences of fragmentation by roads, railway and plantations. Climate change may cause changes in habitats, so species will need habitat corridors and stepping stones to be able to move in response to changes. The Sefton Coast Nature Conservation Strategy[17] identified that the most challenging issues, requiring a co-ordinated response are: ■ The need to reduce the fragmentation of habitats, and the impact of fragmentation, to provide stepping stones for the movement of species. ■ The need to counter negative changes to low-nutrient habitats resulting from atmospheric nutrient deposition. ■ The continuing coastal erosion at Formby Point which leads to a squeeze on habitats (resulting in a loss of coastal habitats when these cannot 'roll back'). ■ The need to consider the potential impact of climate change on shorelines, wetlands and dunes.	Maintain the exceptional biodiversity of the Sefton Coast, with its nationally and internationally important habitats and species, as well as the network of Local Wildlife Sites. Manage and restore habitats including wet grassland, coastal flood plain and grazing marsh, coastal salt marsh and coastal sand dune habitat. Enable habitats to adapt to coastal change and climate change. Prevent further fragmentation of coastal sand dune systems and the important habitat types within them. Seek opportunities to link fragmented habitats increasing the connectivity of semi-natural habitats, by providing corridors or stepping stones, enabling connectivity of coastal sand dune habitats and links between the foreshore and the hinterland, to enable species to move in response to habitat changes. Monitor pollution and improve pollution controls where necessary. Improve the condition of the coastal sand dune habitats through management such as grazing and mowing. Seek opportunities to allow natural 'roll back' of coastal sand dunes.	**Biodiversity** **Climate regulation** **Regulating coastal erosion and flooding** **Sense of place/ inspiration** **Tranquillity** **Recreation** **Geodiversity**

[17] The Sefton Coast Nature Conservation Strategy (October 2008)

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Biodiversity *Continued from previous page*		In winter they provide essential feeding and roosting areas for large populations of wading birds and wildfowl. Inland areas can provide supporting habitat for species such as pink-footed goose, which feed largely on farmland and grazing land in the surrounding area. There are significant populations of many internationally, nationally and regionally important species. Assemblages of vascular and non-vascular plants, including dune helleborine and a liverwort known as petalwort. The Sefton dunes have a rich invertebrate fauna. Notable invertebrate species include the sandhill rustic moth. There are important populations of red squirrel.		■ The need to develop and maintain management practices which sustain the conservation value of the area. Some agricultural land supports breeding populations of farmland birds, especially lapwing, as well as internationally important overwintering flocks of pink-footed goose. The importance of feeding overwintering flocks of protected species highlights nature conservation issues affecting agricultural land. Inland areas outside of designated site boundaries are also important as high tide roost sites for many species. The Sefton coastal dunes sustain isolated populations of natterjack toad and sand lizard. The former requires shallow open pools in which to spawn; the lizard favours dry dune grassland. The great crested newt is also well-represented in the dune systems. Vegetation overgrowth and rapid scrub development in the coastal sand dunes can pose a threat to the specialist flora and fauna. The management of coastal sand dune systems should take into account the need to maintain the range of habitats and associated species reflecting the different stages of succession, by maintaining (or restoring where necessary) the natural processes and dynamics of dune development and succession. The red squirrel occupies the pine plantations which now represents a refuge for this species.	Allow the natural processes (sediment erosion, transport and depositional patterns) to occur. Monitor trends in plant communities, developing practical solutions to managing the mosaic of habitats. Maintain and, where appropriate, expand the populations of, and enhance habitat for, key species, such as natterjack toad and sand lizard. Research into the habitat requirements of key species with the intention of targeting habitat management most effectively. Ensure conditions are suitable for maintaining and, expanding the populations of key wildfowl and waders by providing a mosaic of habitats for feeding and roosting, such as intertidal mudflats and sand flats and coastal salt marsh, and minimise disturbance. Support farmland practices where they support species such as feeding and roosting waders and wildfowl. Maintain the population of red squirrels by appropriate management of their woodland habitat.	

Service	Assets/attributes: main contributors to service	State	Main beneficiary	Analysis	Opportunities	Principal services offered by opportunities
Geodiversity	Geology and geomorphological processes SSSI Soils	The Sefton Coast is of special interest for the diversity of coastal landforms that occur here, in particular for the large, mobile dune system. Part of the coast is a nationally designated a SSSI for coastal geomorphology, in particular for the large, mobile dune system and the multiple sand bars that occur on the foreshore. The dune complex is complemented by features of deposition and erosion on the foreshore including multiple sand bars, relatively stable bar features in the intertidal zone and many different types of sedimentary structures formed by tidal and current action. Buried geological layers (layers of sand, silt and peat) also form part of the archaeological record of the Holocene evolution of the Sefton Coast from about 11,500 years ago to the present day. These form part of the proposed Marine Conservation Zone interest features (Features of Conservation Importance/Species of Conservation Importance) – 'exposed peat and clay beds' including the piddocks that live within this habitat.	Regional	The zone of coastal sand dunes around Formby Point has been eroding since 1906 while areas north and south of this zone are accreting (where the nature of the coast allows). The rapid erosion is therefore reducing the area of shifting dunes at Formby, and high, steep eroding dunes abut the beach with extensive areas of wind-blown sand immediately inland. Improving interpretation of and access to geodiversity would enhance public understanding and enjoyment of the area and strengthen sense of place.	Maintain the function of geomorphological processes; allow natural evolution of the coast, as well as the dynamic process of erosion and accretion to continue where possible. Allow for the exposure and interpretation of the nationally important geological formations and coastal geomorphological processes. Conserve national and local sites that have been identified for their geological interest; where possible providing opportunities to view them and for further research and understanding of the area's geology. Through imaginative interpretation, deepen appreciation among landowners and the public, of the links between geology, landscape and wildlife habitat and their relevance to conserving biodiversity and to sustainable development.	**Geodiversity** **Regulating coastal erosion** **Sense of place/ inspiration** **Sense of history** **Recreation** **Biodiversity**

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