

Kelling to Lowestoft Ness Shoreline Management Plan

Appendix D: Thematic Studies

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D1 Introduction

This Appendix contains the theme review and identifies key features along the coast and why these features are important to stakeholders, i.e. the benefits that the feature provides in terms of nature conservation, landscape and character, human environment, including current and future land-use, and heritage. Information from this review has been used as a basis for developing policy options and assessing the implications and thus suitability of these options.

The division of the coast used in this document is not related to Policy Units but has been defined as appropriate units for discussing each theme.

Maps illustrating the themes are included in Annex D1.

D2 Natural Environment

D2.1 GENERAL

This section reviews the status of the 'natural' features present on the Kelling to Lowestoft coast, which includes significant areas designated for their international and national nature conservation and earth heritage importance.

The Kelling to Lowestoft Ness coastline comprises long stretches of soft cliffs, interspersed by lower lying land, which is fronted in most places by sand dunes and hard coastal defences. The key natural features along the coastline are as follows:

- Soft eroding cliffs, up to 70m in height, are present along the coastline between Kelling and Happisburgh; these contain Pleistocene sediments of nationally important geological and palaeontological interest and support nationally important species and habitats.
- Low-lying coastline between Happisburgh and Hemsby with extensive dune systems.
- Heavily defended coastline between Hemsby and Lowestoft, with stretches of low soft cliffs and lower-lying areas of dunes such as the Great Yarmouth North Denes.
- The low-lying wetland complex of the Broads within the tidal floodplain behind the Happisburgh to Lowestoft frontage.

D2.2 NATURE CONSERVATION AND EARTH HERITAGE

D2.2.1 Overview

The coast between Hunstanton (to the west of the SMP area) and Sheringham, and between Sheringham to Lowestoft, is designated as two Maritime Natural Areas. Inland and along the coastal fringe, the study area also includes parts of the Broads and North Norfolk Terrestrial Natural Areas.

Posford Haskoning (2003b) identifies the diversity of species and habitats in the Maritime Natural Area between Sheringham and Lowestoft as including:

- Nationally significant sand dune habitat, supporting breeding little tern and grasses such as marram grass, dune fescue, rush leaved fescue and grey hair grass, and extensive dune heath with lichens and Natterjack toad present.
- A diverse range of invertebrate and maritime plant communities on the mobile soft cliffs.
- Hard rock marine communities on the chalk platform (the only site in East Anglia).

The underlying geology of the coastline is chalk, which dips eastwards where it becomes overlain by Pleistocene deposits, which is exposed in the cliffs between Sheringham and Happisburgh. The North Norfolk Natural Area Profile (English Nature, 1997) identifies the stretch of coastline between Hunstanton and Happisburgh as a "*largely unspoiled zone of internationally important glacial and post-glacial landforms and contemporary coastal processes*".

The cliffs of the eroding coast between Weybourne and Happisburgh are of national and, in many instances, international importance for their geological features. In addition, the cliffs between Cromer and Mundesley, particularly in the vicinity of Overstrand and Sidestrand to Trimmingham, are nationally

important for their geomorphological interest, demonstrating landslides and other aspects of mass movement.

There is also a number of Geological Conservation Review (GCR) sites and geological SSSIs, with the West Runton Cliffs and Sidestrand to Trimmingham Cliffs of international importance for Pleistocene stratigraphy, palaeontology and palaeoenvironments and modern coastal geomorphology. There is a number of type localities for Pleistocene stratigraphic features including Beeston Cliffs (Beestonian), West Runton Cliffs (Cromerian stratotype) and Weybourne Cliffs (Weybourne Crag).

D2.2.2 Statutory Designations

The special quality of the natural habitats on this coast is recognised in a number of national and international designations, protected under statutory international and national legislation, as well as regional and local planning policies. These are as follows:

(a) International Designations

Three sites of international importance are located along the frontage:

- Overstrand Cliffs candidate Special Area of Conservation (cSAC)
- Winterton-Horsey Dunes cSAC
- Great Yarmouth North Denes Special Protection Area (SPA).

Within the coastal floodplain is the Broads, an extensive low-lying area of rivers and marshes, which is recognised by the following international designations:

- Broadland cSAC
- Broadland SPA
- Broadland Ramsar site
- Breydon Water SPA
- Breydon Water Ramsar site.

(b) National Designations:

Along the coastal frontage, a number of stretches of the cliffs and sand dune systems are of national nature conservation importance and designated as Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) or Geological Conservation Review (GCR) site:

- Weybourne Cliffs SSSI (also GCR site)
- Beeston Cliffs SSSI (also GCR site)
- West Runton Cliffs SSSI (also GCR site)
- East Runton Cliffs SSSI (also GCR site)
- Overstrand Cliffs SSSI (also GCR site)
- Sidestrand to Trimmingham Cliffs SSSI (including four GCR interests)
- Mundesley Cliffs SSSI (also GCR site)
- Happisburgh Cliffs SSSI (also GCR site)
- Winterton-Horsey Dunes SSSI (including Winterton Dunes NNR and Winterton Ness GCR site)

- Great Yarmouth North Denes SSSI
- Corton Cliffs SSSI (also GCR site).

Within the tidal floodplain there is a number of SSSIs protecting the mosaic of wetland habitats associated with the Broads rivers. These, together with their component National Nature Reserves (NNRs), are grouped according to the river catchment in which they are located (where applicable) and comprise:

Northern Broadland (inland of Sea Palling)

- Calthorpe Broad SSSI (including Calthorpe Broad NNR)
- Priors Meadows Hickling SSSI
- River Thurne
- Upper Thurne Broads and Marshes SSSI (including Hickling Broad and Martham Broad NNRs)
- Ludham – Potter Heigham Marshes SSSI (including Ludham Marshes NNR)
- Shallam Dyke Marshes SSSI
- River Ant (tributary of River Thurne)
- Ant Broads and Marshes SSSI (including Ant Broads and Marshes NNR)
- Alderfen Broad SSSI

River Bure

- Bure Broads and Marshes SSSI (including Bure Marshes NNR)
- Upton Broads and Marshes SSSI
- Trinity Broads SSSI
- Burgh Common and Muckfleet Marshes SSSI
- Damgate Marshes, Acle SSSI
- Decoy Carr, Acle SSSI

River Yare

- Cantley Marshes SSSI (including Mid Yare NNR)
- Yare Broads and Marshes SSSI (including Mid Yare NNR)
- Limpenhoe Meadows SSSI
- Halvergate Marshes SSSI
- River Chet (tributary of River Yare)
- Hardley Flood SSSI
- Broadland estuary (confluence of Rivers Yare and Waveney)
- Breydon Marshes SSSI

(c) Non-statutory designations

In addition, there is a range of sites and features covered by non-statutory designations, which are recognised within the statutory and non-statutory planning framework. These include:

County Wildlife Sites (CWSs): In addition to the statutory designations, some stretches of the coastline are designated as CWSs (CWS reference number provided in brackets):

- Kelling Hard CWS (1107)
- Beach Lane CWS, Weybourne (1156)
- Cromer Sea Front CWS (1201)

- Happy Valley CWS, Cromer (2101)
- Overstrand Cliffs CWS (1202)
- Marram Hills CWS (Sea Palling to Waxham) (1247)
- Waxham Sands Holiday Park CWS (1231)
- California Coastal Strip CWS (1443)

There is also a number of County Wildlife Sites located within the flood plain areas, with reference numbers: 1223, 1229, 1230, 1232, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1244, 1245, 1246, 1248, 1249, 1250, 1436, 1437, 1438, 1440.

Nature Reserves: The RSPB owns Berney Marshes and Breydon Water Reserve just inland from Great Yarmouth. The RSPB also operates a special wardening scheme on North Denes beach at Great Yarmouth to protect the UK's largest colony of little terns.

D2.2.3 Biodiversity

The National, Norfolk and Suffolk Biodiversity Action Plans cover this frontage. They include both Habitat and Species Action Plans, many of which are relevant to the coast. Details of the habitats and species identified are given in Annex D2. Posford Haskoning (2003b) sets out the biodiversity targets for the maintenance, restoration or creation of Biodiversity Action Plan (BAP) designated habitats within the Sheringham to Lowestoft Natural Area. These are as follows (as identified on the English Nature website):

Habitat	Priority	Targets
Littoral and sublittoral chalk	Local	Target 4.1 Maintain the chalk platform at West Runton Cliffs SSSI as a viable rocky foreshore habitat. Adopt sustainable management practices for all uses on littoral and sublittoral habitats.
Maritime cliff and slopes	National	<p>Target 4.1 Seek to maintain the existing maritime cliff resource, by ensuring no further loss to extent or quality of cliff-top semi-natural habitats. Specific target: maintain 25.5 kilometres by 2015</p> <p>Target 4.2 Ensure that Shoreline Management Plans promote policies that will maintain, wherever possible, free functioning of coastal processes acting on maritime cliff and slope habitats.</p> <p>Target 4.3 Seek opportunities to increase the extent of eroding cliffs over time, by allowing natural processes of cliff mobility to continue. Consider opportunities of freeing up currently protected soft cliffs over the next 20 years, taking into account national guidance.</p> <p>Target 4.4 Semi-natural cliff vegetation should be maintained (whilst allowing for the dynamic nature of the coast) and consideration should be given to re-creation of coastal grassland, to allow plants and animals to colonise from existing cliff top areas before these are lost to erosion. Specific target: increase by 10 hectare(s) by 2020</p> <p>Target 4.5 Improve by appropriate management the quality of at least 30% of the maritime cliff and slope habitats, including cliff-top grassland and heath, by 2010, and as much as possible before</p>

		2015. Specific target: restore 7.6 kilometres by 2015
Coastal sand dunes	Local	<p>Target 4.1 Ensure that shoreline management plans promote policies that will allow natural processes for the creation and maintenance of dunes to operate, where practicable, and so sustain the area and quality of this habitat. Specific target: maintain 446 hectare(s) by 2010</p> <p>Target 4.2 Consider opportunities to increase the length of high accreting beaches and foredunes, providing opportunities for bird and mobile dune communities.</p> <p>Target 4.3 Restore areas of dune heath, slack and grassland and ensure sustainable management through the implementation of traditional grazing. Specific target: restore 60 hectare(s) by 2010</p>

In addition, for the area between Kelling and Sheringham, which is in Natural Area Old Hunstanton to Sheringham, the following will apply (but to a very small area):

Coastal vegetated shingle	National	<p>Target 4.1 Maintain and protect the existing vegetated shingle structures along the North Norfolk Coast, (Estimated at 85 ha vegetated; 120 ha unvegetated). Ensure that shoreline management plans promote policies that will allow natural processes for the creation and maintenance of shingle to operate, where practicable, and so sustain the area and quality of this habitat. Specific target: maintain 205 hectare(s) by 2015</p> <p>Target 4.2 Encourage reinstatement of wetland vegetation on shingle sites (where appropriate), by scrub clearance and grazing.</p> <p>Target 4.2 Secure appropriate management for all vegetated shingle SSSIs by 2005, achieving favourable condition, wherever feasible, by 2010.</p> <p>Target 4.2 Prevent, where possible, further exploitation of, or damage to, existing vegetated shingle sites through human activities (e.g. implement visitor management provision), and maintain the quality of existing plant, bird and invertebrate communities which are currently in favourable condition.</p> <p>Target 4.3 Seek opportunities to improve the condition of vegetated shingle structures and fringing beach habitats that are degraded/damaged and to prevent further deterioration quality by 2010.</p> <p>Target 4.4 Consider options to allow the partial set back of the existing shingle ridges: - allow the natural westward and landward movement of shingle spit/ridge systems at Blakeney Point (no intervention). Consider option, in the long term, to allow the shingle ridge at Kelling Quay to Cley Coastguards to re-profile itself naturally. In the short term encourage beech feed schemes/ re-profiling to minimise the impact on the existing freshwater habitats. Replacement areas for grazing marsh/reedbeds creation should be</p>
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		sought elsewhere along the north Norfolk coast (link to grazing marsh, reedbeds HAPs).
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D2.2.4 Features

(a) *Kelling to Weybourne*

The shingle beach at Kelling marks the eastern end of the internationally important stretch of the north Norfolk coastline designated as the North Norfolk cSAC, SPA, Ramsar site and the Wash and North Norfolk Coast marine cSAC. The shingle ridge at Kelling Hard is of no designated nature conservation importance, although behind the shingle beach are two sites of local nature conservation importance (CWSs): Kelling Hard CWS and Beach Lane CWS. Kelling Hard CWS is comprised of a mosaic of unimproved, slightly calcareous and neutral grassland, which shows a coastal influence. Beach Lane CWS is an area of reed bed occupying a shallow silty pool situated just inland from the shingle ridge at Weybourne Hope.

(b) *Weybourne Cliffs*

The cliffs east of Weybourne are of national importance, designated as a SSSI for their geological and biological features of national importance and are also a GCR site. The cliffs host colonies of sand martins (*Riparia riparia*), along the faces, and fulmars (*Fulmarus glacialis*), on the ledges. The cliffs also expose outstanding Pleistocene sections of pre-Cromerian deposits of the Cromer forest bed over-lying Cretaceous Upper Chalk, and this is the type locality for the Pastonian 'Weybourne Crag'. These cliffs are also of considerable palaeontological interest and have thus far yielded many large and small mammal remains, with considerable potential for future vertebrate finds.

(c) *Sheringham to Cromer*

The cliffs between Sheringham and East Runton are of considerable geological significance for Pleistocene geology and palaeontology, with three SSSIs located along the frontage. Beeston Cliffs SSSI is located immediately east of Sheringham and is a nationally important reference site for Pleistocene geology, providing the type-site for the Beestonian stage of the Pleistocene. The cliffs are also designated for their biological interest and the stretch of unimproved calcareous grassland along the cliff edge contains the nationally rare plant, purple broomrape (*Orobancha purpurea*) and other characteristic calcareous species.

Further east along the frontage is the West Runton Cliffs SSSI, one of the most important Pleistocene localities in the British Isles. At this site, the exposed sediments reveal glacial and interglacial Pleistocene deposits containing significant mammal, reptile, amphibian, freshwater shell, pollen and plant fossil remains and has yielded the richest Pleistocene fauna in the UK. This site is an internationally important locality for its Pleistocene vertebrate fauna, as evidenced by the discovery of complete elephant fossil remains in the 1990s.

The East Runton Cliffs SSSI is located to the east of the West Runton SSSI, where along the foreshore, a series of marine Lower Pleistocene sediments are exposed. These deposits contain an extensive vertebrate fauna, including marine fish and mammals, and East Runton Cliffs SSSI is the best available locality for fossil vertebrates of this age.

The LEAP Consultation Draft for North Norfolk (Environment Agency, 1996) and the North Norfolk Natural Area Profile (English Nature, 1997) also identifies the chalk/flint reefs off Cromer and Sheringham as of particular interest. These are the only hard rock structures on the east coast between Flamborough Head and the Kent coast and support an exceptionally diverse marine fauna and flora. They are an “oasis for rock dwelling organisms ... in a region that is otherwise characterised by sediment dwellers” (English Nature, 1997).

(d) Cromer to Overstrand

The stretch of coast between Cromer and Overstrand provides the best example of soft cliff habitat in East Anglia, and the Overstrand Cliffs have been designated internationally as a candidate SAC and nationally as a SSSI. Part of Overstrand SSSI is also designated as a GCR site.

The cliffs are up to 70m high and consist of unconsolidated Pleistocene sediments, which are unprotected by sea defences and are subject to cliff falls and slumping. This instability has led to the development of an extensive successional series of habitats, ranging from uncolonised mud flows and bare sand, ruderal communities, to semi-stabilised and relatively mature unimproved grassland and scrub communities. This diverse range of sub-maritime habitats is of considerable biological, entomological and ecological importance, with colonies of nationally important plant species, invertebrates (butterflies, moths, soldier-flies and beetles) and birds (sand martins and fulmars). Vegetated sea cliffs are an Annex I habitat and the primary reason for the selection of the site as a cSAC.

In addition to their biological value, the cliff exposures at the eastern end of the SSSI provide important information concerning the glacial history of the area. The special value of the Overstrand Cliffs lies in the completeness of the succession of glacial sequences (shows all three Cromer Till and intervening beds) and the variety and style of the deformation structures, which are internationally important coastal geomorphological features and are not seen elsewhere along the coast.

Cromer Sea Front CWS comprises the coastal cliffs, beach and intertidal zone between East Runton Cliffs SSSI to the west and Overstrand Cliffs SSSI to the east. Semi-natural vegetation is confined to the cliff faces, but scattered through the site are species-rich patches. The cliffs also provide nesting sites for fulmars (*Fulmarus glacialis*). Between the southern boundary of the Overstrand Cliffs SSSI and the northern boundary of the Sidestrand to Trimmingham Cliffs SSSI is the Overstrand Cliffs CWS. This comprises the maritime cliffs and foreshore at Overstrand and is of local ecological interest due to the development of vegetation along the slumped cliff slopes, although coastal defence works have heavily modified this area. The cliffs are shallow sloped as a result of slumping and the vegetation is a diverse mixture of communities, many influenced by seepage. The beach comprises sand and areas of gravels interspersed with groynes and is heavily used and disturbed (Posford Haskoning, 2003b).

(e) Overstrand to Mundesley

The soft cliffs between Overstrand and Mundesley extend for a distance of 6.5km, are up to 60m high and are subject to frequent cliff falls and slumping. They are of national and international importance, containing two SSSIs (Sidestrand to Trimmingham Cliffs SSSI and Mundesley Cliffs SSSI) and four component GCR sites.

Four aspects of the geology of the Sidestrand to Trimingham cliffs are of international and national importance: the chalk, the Pleistocene sediments, fossil vertebrates, and mass movement. The chalk outcrops contain a rich fossil invertebrate fauna and provide the youngest exposure of Upper Cretaceous chalk in the British Isles (the Maastrichtian succession), which is of fundamental importance to British Cretaceous geology and of wider significance to studies of the late Cretaceous elsewhere in north-west Europe. The rotational landslips at Overstrand and between Sidestrand and Trimingham are internationally important coastal geomorphological features. The cliffs also expose one of the best pre-glacial stratigraphic sequences in England.

Although the geological features of this site are of particular note, this site is also probably the best soft cliff site for invertebrates in East Anglia, with modern records for a number of rare Coleoptera and Isopoda, while the cliff top flora includes a large colony of the Red Data Book species, purple broomrape. Typically for the soft cliffs along this coastline, their mobility creates a mosaic of habitats from bare clay and sand to ruderal communities and semi-stabilised grassland with occasional seepage lines developing areas of flush vegetation.

(f) Mundesley to Happisburgh

Within the town of Mundesley, the cliffs and cliff top grassland are designated as a CWS; part of this site runs adjacent to Mundesley Cliffs SSSI, which are designated for their geological interest, as they represent a nationally important site for its extensive Pleistocene sequence, with some of the best sections of the Pleistocene Cromer Forest-bed Formation in the UK.

(g) Happisburgh

The cliffs at Happisburgh are designated as the Happisburgh Cliffs SSSI. This locality is important for the cliff exposures, which uniquely show three glacial deposits and are important for dating the Pleistocene succession of East Anglia, with a range of sediments from marine to freshwater and glacial.

(h) Happisburgh to Winterton

The linear stretch of sand dunes along the coastline between Eccles on Sea and Winterton is designated as the Marram Hills CWS and Waxham Sands Holiday Park CWS. The Marram Hills CWS site is described as an extensive coastal site that includes the foreshore and dunes, together with small adjacent areas of scrub and grassland on the landward site and extends to just south of Waxham. Waxham Sands Holiday Park CWS is a smaller site which encompasses a complex mosaic of habitats with the seaward edge typified by unmodified semi-fixed dune vegetation with a range of largely unimproved dry to damp acidic grassland swards further inland.

To the south, the stretch of coast between Horsey and Hemsby (Winterton) consists of an extensive dune system supporting well developed areas of dune heath, 'slacks' and dune grassland verging into grazing marsh and birch woodland. This is a composite site made up of the NNR at Winterton Dunes and the former separate SSSIs at Horsey Warren, Winterton Dunes and Winterton Great Valley. The whole area is a Grade 1 NCR site. This site is also designated both as an internationally important cSAC and is unusual in that it shows greater ecological similarities to the dune systems of the west coast, supporting acidic plant communities, than the geographically closer, but calcareous, dunes along the north Norfolk coast. Component habitats of the cSAC include the priority habitat decalcified

fixed dunes, embryonic shifting dunes, humid dune slacks and shifting white dunes. A rare amphibian, Natterjack toad (*Bufo calamita*) breeds in shallow pools behind the main dune ridge and the site is the only Norfolk locality for a rare butterfly (name not provided by the SSSI designation). Aside from the interest features of the cSAC, the SSSI includes damp, fern rich meadows, which form a large area of rough tussocky grassland behind the main dunes. Aside from the internationally and nationally important nature conservation interest of the Winterton to Horsey Dunes SSSI, the site is also of physiographic significance in being one of a number of 'ness' features that are characteristic of the East Anglian coast, designated as Winterton Ness GCR site. This site is significant for the well-formed dunes, which are its most characteristic landform, and the processes that affect its continued development.

The site supports a wide range of breeding and over-wintering birds, also forming part of the Great Yarmouth North Denes SPA, which hosts nationally important numbers of breeding little terns (*Sterna albifrons*).

The Winterton CHaMP (Posford Haskoning, 2003a) covers the Winterton-Horsey Dunes and Great Yarmouth North Denes SPA and their constituent SSSIs. The CHaMP indicated that replacement of the fixed dune habitat present at Winterton would not be viable. It has also been recognised that the beach recharge (associated with the Happisburgh-Winterton offshore reef scheme) provides embryonic dune habitat and suitable breeding habitat for the little tern.

(i) Winterton to Caister

Behind the main dune belt at Winterton is the Winterton PCC Land CWS. This is cited as being an important buffer chain to Winterton Dunes National Nature Reserve and consists of dense shrub and woodland with a mosaic of grassland communities.

To the south, the coastal sand dunes and the cliff top habitats at California are designated as California Coastal Strip CWS. This is an area of dense bracken and scrub with patches of shorter, more species-rich fixed dune grassland.

(j) Caister to Great Yarmouth

The dune system between Caister and Great Yarmouth is an important example of an actively accreting 'ness' or promontory, which supports a full successional sequence of vegetation from pioneer to mature types; including foredune, mobile dune, semi-fixed dune and dry acid grassland. This area is of national nature conservation importance, designated as the Great Yarmouth North Denes SSSI. The area is also of international importance as the foreshore supports the largest breeding colony of the rare little tern in the UK, forming part of the internationally designated Great Yarmouth North Denes SPA. This SPA includes the accreting low dune system and beach at Great Yarmouth, together with the beach and foredune ridge at Winterton-Horsey dunes.

Similar to the Winterton to Horsey Dunes SSSI, the Great Yarmouth North Denes SSSI is also of physiographic significance as one of a number of 'ness' features that are characteristic of the East Anglian coast. However, in contrast to the Winterton to Horsey coastline, this site is actively accreting.

(k) Gorleston to Lowestoft

The cliffed section at Corton is a nationally important Pleistocene site and is designated as a geological SSSI. This site is the type locality for the Anglian Cold Stage, during which the most extensive Pleistocene glaciation occurred, and the cliffs expose a clear sequence of deposits.

Ness Point in Lowestoft has been designated as a CWS as the artificial sea defences provide a valuable habitat for overwintering purple sandpiper (*Calidris maritima*), an uncommon species in the UK.

(l) The Broads

The Rivers Yare, Bure and Waveney and their major tributaries form the main arteries of the Broads area, which is designated as having equivalent status to that of a National Park. The tidal reaches of these rivers are included within the study area as they are located within the tidal floodplain behind the Happisburgh to Lowestoft frontage. The nature conservation importance of this area is demonstrated by the designation of over 6,000 ha of the Broads as nationally important SSSIs and internationally important cSAC, SPA and/or Ramsar sites.

The Broads are an internationally important wetland complex, influenced by water quality ranging from brackish to freshwater, mesotrophic and eutrophic. Annex I habitats, for which the Broads are designated as an internationally important cSAC, comprise calcareous and alkaline fen, alluvial alder forest, open water with charophytes, transition mire and natural eutrophic lakes habitats. These support Desmoulin's whorl snail (*Vertigo moulinsiana*) and fen orchid (*Liparis loeselii*). The area is of international importance for wintering and breeding raptors, e.g. marsh harrier (*Circus aeruginosus*), and waterbirds associated with the extensive lowland marshes and is designated as the Broadland SPA and Ramsar site. In addition, Breydon Water SPA and Ramsar site (which includes Breydon Water and a section of Halvergate Marshes SSSIs) cover the inland estuarial area at the confluence of the Rivers Yare, and Waveney near Great Yarmouth. This area contains the only saltmarsh and intertidal mud and sand flat habitats in the study area, which supports internationally important populations of wintering waterbirds and breeding common tern (*Sterna hirundo*).

Within the tidal floodplain are a number of nationally important SSSIs and NNRs, many of which also form part of the Broads SPA, cSAC and Ramsar designations. These are listed and grouped according to river catchment in Section D2.2.2(b). The RSPB also have nature reserves at Berney Marshes at the confluence of the Rivers Yare and Waveney and at Breydon Water.

There are a large number of CWS in this area (see Section D2.2.2(c) for reference numbers).

D3 Landscape and Character

D3.1 GENERAL

This section reviews the status of the landscape and character of the Kelling to Lowestoft Ness coast. The visual appearance of the natural and built landscape is an important factor in the appeal of a location to both residents and visitors. The landscape is also important in terms of quality of life and for the tourist and holiday industries.

The first part of the review comprises information on the national and regional designations of the study area including the reasons for designations and policies on protection and enhancement. The second part of the review focuses on specific landscape features of the study area.

D3.2 LANDSCAPE AND VISUAL FACTORS

D3.2.1 Overview

Several areas of the coastline are considered to be of high value, as reflected in their Area of Outstanding Natural Beauty (AONB), Special Landscape Area (SLA) and Local Landscape Area (LLA) designations. Local landscape designations are covered by policies in the relevant local authority plans and their importance is strongly recognised and stated.

Much of the Kelling to Lowestoft Ness coastline is of national landscape importance and falls within the Norfolk Coast Area of Outstanding Natural Beauty (AONB). This comprises of a large coastal section in North Norfolk and a smaller one coinciding with the Broads Authority Executive Area between Winterton and Horsey. The Norfolk County Council describes this coastal strip as “*an undulating, intimate landscape under huge skies, the AONB is characterised by its imposing churches and quiet brick and flint villages and small towns*”.

The Norfolk designation as an AONB is of national landscape importance and offers special status in the control of development. It establishes the primary purpose as the conservation and enhancement of natural beauty, which include protecting flora, fauna and geological as well as landscape features. The Norfolk Structure Plan gives particular emphasis to the need to protect the county’s rural landscape. Policy E1 states that “*the county council will, in conjunction with the district councils, protect, conserve and enhance the character of the rural landscape...*”. Also policy E7 contains specific protective reference to the Norfolk AONB, and states that “*development which would be detrimental to the character and appearance of ...Areas of Outstanding Natural Beauty...will not be permitted*”.

The North Norfolk Local Plan (NNLP) states (Policy 20) that “*in the Norfolk Coast Area of Outstanding Natural Beauty the prime planning consideration will be the conservation and enhancement of the beauty of the area, and development proposal that would be significantly detrimental to it will not be permitted*”. Equally however, the NNLP recognises the influence of Man in shaping the landscape and the need to conserve the archaeological, architectural and vernacular features that contribute to the special character of the AONB.

In addition to the national designation as an AONB, almost all of North Norfolk has been identified as an area of High Landscape Value. Policy 21 of the NNLP is set out to protect the character of the Area of High Landscape Value, just like Policy 20 of the same plan. Policy 31 refers to landscape enhancement through positive management.

(a) Landscape Character Areas

The landscape of the SMP area exhibits considerable variety, from the open, elevated landscapes in the west to the intimate wetland landscapes on the edges of the Norfolk Broads. In order to facilitate the understanding of this complex landscape, the Norfolk District has been divided into seven landscape character areas, each with a locally cohesive identity. Three of these landscape areas fall within the study area, namely:

- Cromer Ridge
- Central Farmlands
- Fenland Levels

At a more local scale the diverse range of landscapes is subdivided to landscape types. In our study area the following are the most frequently found landscape types:

- Fenland
- Marginal coastal farmlands
- Sand dunes
- Marshland
- Pastoral landscape
- Open arable farmland
- Enclosed farmland
- Parklands

(b) Pressures on the landscape/conflicts of interests

The North Norfolk Local Plan (NNLP) highlights the importance of conserving the existing character and landscape quality of the North Norfolk coastline. It also recognises that tourism can have a detrimental impact upon the existing environment and encourages the controlled growth of tourism out of season and not at the expense of the scenic beauty or cultural heritage of the area. Policy 20 of the North Norfolk Local Plan emphasises that large-scale development is unacceptable in the AONB and only proven national interest and a lack of alternative development sites can justify any exception to this policy.

Policy 25 of the NNLP, which refers to the Undeveloped Coast, does not permit developments on the undeveloped coast if they do not require a coastal location or if they are likely to be detrimental to the appearance or character of the coastal area.

Policy 115 of the NNLP does not permit the extension of existing golf courses, nor does it allow the development of new ones in the North Norfolk AONB and in Historic Parks and Gardens (which are discussed in Section D4).

D3.2.2 Features

(a) *Kelling to Mundesley*

This stretch of the north Norfolk coast falls within the Norfolk AONB, the boundary of which skirts around the town of Sheringham and the resorts of Overstrand and Mundesley. The Cromer Ridge, a glacial feature constituting the highest ground in Norfolk, dominates this stretch of the coast and it is recognised as a distinct **Landscape Character Area** (North Norfolk Local Plan, 1998). This dominant physical feature is formed by a glacial terminal moraine, which rises up to form a line of impressive low cliffs along the coast. The cliff height peaks to 65m around Trimingham. The irregular hummocks present a landform typical of such glacial features. Many of the wooded areas are part of the 18th century *parklands*, which are associated with established country houses. Areas of heathland are still found throughout this character area with the flowering gorse being a particularly spectacular feature. Much of the heathland has been turned into *enclosed farmland*. These landscapes have more visual interest than the expansive *open arable* farmland, which occurs around Mundesley.

Overstrand cliffs are one of the best examples of unprotected vegetated soft cliffs on the North Sea coast in the most easterly part of the UK. Numerous caravan sites are located on the cliff tops along Cromer Ridge. Although the North Norfolk Local Plan (Policy 115) seeks to promote the development of tourism in North Norfolk, the District Council is concerned about the visual impact of existing cliff top caravan sites in the Sheringham to Overstrand coastline.

(b) *Mundesley to Bacton Green*

This area falls within the Cromer Ridge **Landscape Character Area** but the cliffs become sandier, better drained, vegetated and more stable, and their height decreases to almost half of that at Trimingham. The cliffs are fronted by sand/ shingle beaches.

This stretch of coast contains the popular resort of Mundesley, with important tourist accommodation and facilities including a promenade, car parking and beach access areas. The AONB boundary skirts the resort of Mundesley and rejoins the coastline further south.

(c) *Bacton Green to Winterton Ness (including the Broads)*

This coastal stretch falls within the Fenland Levels (or Margins) **Landscape Character Area**, which forms the landscape setting for the Norfolk Broads. The coastal area changes from low-lying cliffs in the north to low-lying flood plain to the south, with the coastline in retreat throughout. Inland, the area is very low-lying, with most of the land being below 10m. The most dominant landscape type is a wide tranquil, *pastoral landscape* (mainly inland) with long views looking towards a line of *sand dunes* along the coastline. In the wettest parts of the valley floor, the landscape takes on *fenland* characteristics. On drier, rising land around the fenland there are areas of *heathland* with birch and gorse scrub. These landscapes are of nature conservation and historical significance, and their intricate detail has a high level of visual interest. Marginal coastal farmlands are found along the coastline, usually separated from the sea by a line of *sand dunes* and a seawall. The northern part of the coastal area is mainly agricultural land with the exception of the village of Happisburgh. The *sand dunes* are a distinct **landscape type**, their marram grass sometimes being followed in natural succession by extensive coniferous woodland.

Part of this coastal area falls within the Norfolk Coast AONB. All human development between Happisburgh and Winterton is located landward of the sand dune ridge and is not visible from the beach or the sea. Inland, the area between Eccles and Sea Palling has been designated an Area of High Landscape Value (local landscape designation). It presents a view of flat, open, farmland with isolated settlements, church towers, woodland and dykes, resulting in a peaceful rural character. The rural areas, excluding the villages of Sea Palling, Lessingham and Eccles on Sea, are designated an integral part of the Undeveloped Coast.

The Broads also enjoy a status equivalent to a National Park and share the same protection as the National Parks. The only point where the Broads 'National Park' reaches the coast is the section of the coast north of Winterton Ness covering Bramble Hill to Horsey Gap.

(d) Winterton Ness to Hemsby

This stretch of the coastline falls within the Norfolk Coast AONB and the preservation and enhancement of this area is an important issue. Inland from here are the Norfolk Broads, an environmentally sensitive area, large areas of which would be flooded by any breach of the defences. The beach morphology changes along this stretch of coastline from a relatively narrow foreshore and backshore to a significantly wider backshore. This backshore is composed of substantial vegetated dunes, which become increasingly wider, up to 500m. The foreshore is steeply dipping. This coastal morphology contributes to the tourist and recreational value of the area due to good beach access and by virtue of the beach size.

(e) Hemsby to Great Yarmouth

The coastline from Hemsby to Great Yarmouth is developed almost continuously with a mixture of residential properties, holiday accommodation and recreational facilities. There are no landscape designations in this area.

(f) Great Yarmouth to Lowestoft Ness

Although there are no national landscape designations in this area, the GYBC Local Plan recognises areas of 'landscape important to the coast scene', i.e. the remaining unspoilt coastal areas that separate the settlements between Great Yarmouth and Corton. The Local Plan states that within these areas the council will only permit development that would not significantly detract from the essential open character of the area with objective to protect the remaining open coast (Policy NNV3). Similarly, the WDC Local Plan identifies 'strategic gaps and open breaks' between Corton and Lowestoft Ness.

D4 Historic Environment

D4.1 GENERAL

This section reviews the heritage importance and the features found on the Kelling to Lowestoft coast, including both archaeological and historic elements in the terrestrial and marine environments, as well as Historic Parks and Gardens. Along this coastline there is a wide variety of monuments and artefacts ranging from prehistoric burial mounds and flint tools to 20th-century industrial buildings and World War II defensive structures.

Sites and Monuments Records (SMRs) are a primary source of information on the local historic environment. SMRs include databases and collections that cover subjects and periods for archaeology and archaeological investigations ranging from the prehistoric period to the 20th century. Only those recorded as monuments or listed buildings are discussed below, although it is recognised that the implementation of a policy (at either strategy or scheme stage) would also need to consider find sites.

It is important to note that known archaeological sites reflect areas of investigation and that the absence of recorded features does not necessarily mean that no features are present. The concept of 'archaeological potential' is therefore important, particularly in this area where coastal erosion may reveal new sites. This is not, however, an aspect that can be thoroughly explored at SMP level, but will require further investigation at either strategy or scheme level. Also, research on this coastline is still ongoing and the SMRs are currently being supplemented by coastal surveys in Suffolk and Norfolk; the results have not yet been fully incorporated into the records.

All historic environment features can be considered as non-substitutable and rare (i.e. there is not 'enough' of the features). Some judgement can be made, however, on the relative importance and scale of importance, and information has been provided by Norfolk and Suffolk County Archaeologists.

D4.2 TERRESTRIAL

D4.2.1 Overview

Norfolk, and in particular Great Yarmouth, has a recorded history going back to AD 1000. Suffolk is also an area of high archaeological interest with Lowestoft being of particular importance. There are numerous sites of archaeological interest within the coastal zone. The coastal strip contains a significant number of wartime defences, many of which have already been lost as a result of coastal erosion, due to their strategic positioning close to the cliff top.

The importance of archaeological remains is recognised by the Local Authorities that administer the area, with a policy of protecting Scheduled Ancient Monuments (SAMs) and sites of outstanding archaeological importance against development. Scheduling is only applied to sites of national importance, and even then only if it is the best means of protection. Within a two-kilometre strip of the coast between Kelling and Lowestoft Ness there are 19 SAMs, of which 14 are within a square kilometre of each other in Great Yarmouth's town centre.

Historic Parks and Gardens are as much a part of British cultural heritage as buildings because they were constructed with as much care as an architect designing a building and have become an integral

part of the British landscape. They are valued for their beauty as much as they are valued for their history. They include the practical medieval gardens, the formal gardens of the 17th century, the 18th and 19th century “romantic” landscaped parklands and the 20th century “woodland gardens”. The area near the coast between Kelling and Lowestoft has a number of both registered and listed Historic Parks and Gardens.

D4.2.2 Features

(a) Kelling to Sheringham

Along the coastal strip there is a number of sites listed in the SMR, a number of which appear to have already been lost through coastal erosion. The majority of sites are related to wartime defences, for example gun emplacements and pill boxes, and several of these are noted to be of high importance as they represent rare examples.

(b) Sheringham

There is a Conservation Area surrounding the parish of Upper Sheringham. There is a number of monument sites listed within the SMR; the Observation Post on Beeston Regis Hill (HER no. 21298) is noted as a rare example and therefore of high importance and ‘The Lees’ (or St Nicholas’ Gardens) (HER no. 33527), an historic garden, is also noted to be of high importance (ranked as grade two-star in Norfolk Historic Gardens Survey).

(c) Sheringham to Cromer

Between Sheringham and Cromer there is a number of monument sites, many of which relate to evidence of previous industry, e.g. brickworks (HER no. 6420) and a lime kiln (HER no. 6422), or wartime defences. Some sites identified in the SMR have already been lost through coastal erosion and there are two sites that are identified as being of high importance: a moat (HER no. 6394), which may relate to the former site of a windmill, and a ‘ring ditch’ identified through cropmarks, which may be evidence of a burial mound (HER no. 6352).

(d) Cromer

There are two sites noted as high importance within the SMR records: ‘Sunken and Evington Gardens’ (HER no. 33461) and a ‘loopholed’ wall (HER no. 32565), which includes three very rare loopholes (dated 1940). Within Cromer other listed buildings include: Grade II listed Cromer Baptist Church (HER no. 36515), the Gangway and Cromer Pier (HER no. 39328) and Grade I St Peter’s and Paul’s Church.

(e) Cromer to Overstrand

There is only one monument site listed in the SMR records, but this has not been identified as high importance.

(f) Overstrand

A number of artefacts of prehistoric date were found in the vicinity of the proposed cable route at Overstrand for the Cromer offshore wind farm (Posford Haskoning, October 2002). The earliest of these artefacts are possible eoliths recovered from the Cromer Forest Bed, a Pleistocene deposit dating to approximately 500,000 BC. A stone axe and worked flints, including scrapers, of Neolithic

date (4,000 to 2,500 BC) have been recovered from the beach at Overstrand. There are two Grade II listed houses along the coastal strip at Overstrand: 'The Pleasance' (HER no. 6477) (includes the Lutyens buildings) and 'Sea Marge' (HER no. 25396). The Pleasance is also listed as a Historic Park and Garden.

(g) Overstrand to Mundesley

The route of the former Norfolk and Suffolk Joint Railway, a feature of modern archaeological interest, runs in an east-west direction south of the road B1159 to Mundesley. This line was opened in 1898 and was closed in 1953. Two of the monument sites listed in the SMR have already been lost through cliff erosion and the third has not been defined as high importance.

(h) Mundesley

There are number of monument sites recorded in the SMR, including two identified as high importance: a Tank Trap (HER no. 32621) and an underground military headquarters with associative gun emplacement (HER no. 14142), which is probably the only one left intact in Norfolk.

In addition there are two Grade II listed buildings: All Saints Church (HER no. 6884) and a Brick Kiln (HER no. 14141), which is believed to be the only surviving 'haystack' kiln in the county and thus of considerable importance.

(i) Mundesley to Bacton

There are only a few recorded monument sites along this stretch, but one of noted high importance is the remains of an Early Saxon cemetery (HER no. 6872) between Mundesley and Bacton Gas Terminal.

Mundesley Holiday Camp is also a recorded building (HER no. 34570) as it was the first purpose built full catering holiday camp in Norfolk and second in Britain.

(j) Bacton and Happisburgh

There are only a few listed monuments along the coastal strip. The pillboxes which stood along the cliff edge have now mostly been lost through cliff erosion; in places their remains are still present on the beach. Ostend House at Walcott is recorded as a building (but not listed) in the SMR database (HER no. 36222).

(k) Happisburgh Village

A number of monument sites have already been lost due to cliff erosion, including a pillbox, battery and a well. There are two Grade II listed buildings at Happisburgh: Hill House Hotel (HER no. 18473) and Happisburgh Manor (St Mary's) (HER no. 14148). The gardens of the latter are also registered in the historic gardens register (Site no. 35169). St Mary's church is listed as a Grade I property (HER no. 7091).

(l) Happisburgh (Cart Gap) to Winterton Dunes

Along the immediate coastal strip there is a large number of monument sites, but none that have been identified as high importance. There is only one Scheduled Monument in this area; the site of a manorial complex at Hall Farm, Waxham.

The Broadlands area does, however, include a significant number and variety of sites many of which are identified as high importance. The drainage mills are an important part of the industrial archaeology of the Broads. There were once 240 of them in the Broads, but now only 72 survive, ten of which are between Happisburgh and Winterton (Halcrow 2002).

There is a number of Grade II* listed properties including: Horsey Mill (HER no. 8408); All Saint's Church, Horsey (HER no. 8411); St John's Church, Waxham (HER no. 8372), Waxham Hall (HER no. 8248); St Margaret's Church, Sea Palling (HER no. 8381) and St Andrew's Church, Hempstead (HER no. 8379); St Mary's Church, Hickling (HER no. 8393) and Heigham Holes windpump (HER no. 8392).

In addition there is a number of Grade II listed properties: Brograve Mill, Sea Palling (HER no. 8389); Lambridge Mill, Sea Palling (HER no. 8374); Beach Farm (HER no. 36513); wall at Church Farm (HER no. 30680); Little Manor, Hempstead (HER no. 36514); Ling's Mill, Catfield (HER no. 8396); Stubb Mill (HER no. 8391); Martham Ferry (HER no. 33880) and a number of windpumps (HER nos. 8373, 8409, 8547, 35364).

There are two Scheduled Ancient Monuments within the Broadlands area covered by the SMP: Hickling Priory (Monument number: 30625) and Potter Heigham Bridge (Monument number: NF169). Hickling Priory includes standing and buried remain of a medieval priory, which are situated on a slight rise above the marshland (there was no data available for Potter Heigham Bridge).

Part of the village of Potter Heigham is a designated Conservation Area; it is the only coastal Conservation Area amongst a total of 79 in North Norfolk.

(m) Winterton to Caister

There are few monuments records along this stretch and some registered have already been lost through coastal erosion.

(n) Great Yarmouth

Great Yarmouth has a recorded history going back to AD 1000 when it expanded as a seasonal fishing settlement. It grew quickly and by the early 14th century was ranked fifth in wealth amongst English towns. Although the Borough contains 13 Scheduled Monuments (SAMs), none are located along the coast strip. There are two main monuments recognised as high importance along the coastal strip: Norfolk Square (HER no. 15105), part of which is graded by the Norfolk Historic Gardens Survey as two-star (regional importance), and Venetian Waterways (HER no. 33470), which are public seafront gardens graded by the Norfolk Historic Gardens Survey as grade three-star (national importance).

Along the coastal strip there are seven Grade II properties: Wellesley Road Strand (HER no. 34128), Empire Theatre (HER no. 31612), St John's Church (HER no. 4337) the Maritime Museum (HER no. 34308), Windmill Theatre on Marine Parade (HER no. 12028), Wellington Arch (HER no. 17756) and Winter Gardens (HER no. 12029).

The Hippodrome (HER no. 34307) is listed as Grade II* and Norfolk Pillar (or Nelson's Monument) (HER no. 4302) is listed as Grade I.

The Scenic Railway fairground ride at the Pleasure Beach is recorded within the SMR (HER no. 37382), because it is one of the oldest wooden examples still in use, but is not of listed status.

(o) Gorleston

There are two Grade II buildings at Gorleston: Gorleston Pavilion (HER no. 17974) and Old Gorleston Lighthouse (HER no. 10585). There is also a number of monuments classified within the SMR, but none are identified as high importance.

(p) Gorleston to Corton

There are a few monuments along this coastal frontage, but none have been identified as high importance.

(q) Corton to Lowestoft

Much of the SMR information for this area is related to single finds of unknown or low significance; the main areas of interest are the edge of the medieval area of Lowestoft and the area of multiperiod activity (find spots and areas) between Corton Church and the sea, which indicate medieval and earlier settlement (Suffolk County Archaeologists, pers. comm.).

D4.3 MARINE

D4.3.1 Features

There is a number of wrecks between Gorleston and Lowestoft, some of which are quite near the shore. None of them, however, are classified as Historic Wrecks.

There are two known shipwrecks, and 46 lost vessels with no accurately known position. The two wrecks that lie offshore are the Osprey, a British Steamer which sank in 1904 just off Winterton-on-Sea as a result of a collision with the British SS St. Dunstan. The other wreck, the Sheaf Water, is about 2.5km offshore. Of the 46 vessels lost in the area between Eccles on Sea and Winterton Ness, 29 sank around Sea Palling between 1842 and 1917. Most of these were cargo vessels, and two were fishing craft.

There is also an offshore battery site at Lowestoft, which is possibly Napoleonic in origin.

D5 Current and Future Land Use

D5.1 GENERAL

This section reviews the status of the built environment present along the Kelling to Lowestoft Ness coast. The review comprises information on commercial/industrial areas, residential developments, recreational interests and current and future land uses that are located along the coastal strip and within the Environment Agency indicative flood risk areas.

D5.2 CURRENT LAND USE

D5.2.1 Overview

The key land uses along the North East Norfolk coastline include agriculture, residential, industry, recreation and tourism. Tourism is the principal economic activity, with agriculture being an equally important economic activity along the coastline and within the flood risk areas. Norfolk has a long history as an agricultural area and has always had an important fishing industry based around the coast. Other economic activities include:

- Port and harbour operations, including lifeboat stations
- Roads and rail lines
- Water, sewerage, sewage treatment works, gas and power lines
- Fisheries
- Aggregate extraction
- Light industry.

(a) Residential developments

The SMP area contains a number of main coastal towns (population figures based upon population estimates for 2000 or 2001 from Norfolk County Council and Suffolk County Council web sites):

- Sheringham (pop. 6,900) – major residential and tourist town for the area.
- Cromer (pop. 7,900) - major residential and tourist town for the area.
- Great Yarmouth and Gorleston (pop. 46,800) - major residential, industrial and tourist town.
- Lowestoft (pop. 58,500) - major residential, industrial and tourist town.

Smaller towns include:

- Mundesley (pop. 2,500)
- Winterton-on-Sea (pop. 1,400)
- Hemsby (pop. 3,000)
- Caister-on-Sea (pop. 8,600)
- Corton (pop. 1,100).

There are also a number of villages and smaller settlements, with populations less than 1,000):

- Weybourne
- West Runton

- East Runton
- Overstrand
- Sidestrand
- Trimingham
- Bacton
- Walcott
- Happisburgh
- Eccles-on-Sea
- Sea Palling
- Waxham
- Horsey
- California
- Hopton-on-Sea.

The flood risk area contains a number of towns and villages, principally:

- Whimpwell Green
- Lessingham
- Hempstead
- Ingham Corner
- Hickling
- Hickling Green
- Hickling Heath
- Stalham
- Horsey
- Potter Heigham.

(b) Commercial

The key commercial areas relate to the large towns identified in the above section, i.e. Sheringham, Cromer, Great Yarmouth (and Gorleston) and Lowestoft, with the latter two representing areas of greatest commercial interest. The primary industry in the area is tourism (discussed separately in Section (d)), which also supports other commercial industries such as retailing. Other industries within the coastal area are the gas terminal at Bacton and the port at Great Yarmouth (the port of Lowestoft is just to the south of the SMP area). Commercial fishing also takes place along this coastline and Cromer and Sheringham are key areas in Britain for brown crab and lobster.

(c) Agriculture

Agriculture represents an important share of the local economy in Norfolk and Suffolk. It is dominated by cereal production, but also includes the following activities - oil seed, field vegetables and sugar beet production, forestry, poultry, pigs, cattle and sheep, dairy production, horticulture, farm retailing, rural recreation and farm diversification (An Economic Strategy for Norfolk & Waveney, 1997-2007, Facing the Future website). Along the coast strip, the predominant area of Grade 1 agricultural land is between Bacton and Waxham. The majority of the farmland along the rest of the coast is Grade 2 or below.

(d) Recreation, tourism and amenity interests

The Kelling to Lowestoft Ness coastline is a long and varied piece of coastline that attracts visitors for very different reasons, thus providing a valued resource for water and land-based recreation, tourism and amenity interests. Tourism and recreation has long been one of Norfolk and Waveney's core economic sectors and remains an important source of jobs, with over 37,000 currently employed (An Economic Strategy for Norfolk & Waveney, 1997-2007, Facing the Future website), with much of this concentrated along the coastal strip and in the Broads. The employment ratio is significantly higher than the average for the UK as a whole. There are also impacts on associated industries such as transport and retailing.

The relative importance of the coastal strip and the beaches to visitors varies for different parts of the coast. The tourist attractions of considerable importance include both the natural features, i.e. the cliffs, landscape, beaches and sea, and human attractions such as the recreational facilities at Lowestoft and Great Yarmouth. According to a visitor's survey, which was carried out in 1992 (Sheringham to Lowestoft SMP, 1995; 1996), the most attractive features to the north of the study area are the countryside, the scenery, the unspoilt character and the tranquillity of the area. Only 11% of the visitors in the survey cited the beaches and the coastline as their main attraction. This contrasts with Great Yarmouth and Lowestoft area where the beach and the seafront were considered the most important attractions to the area. A number of beaches in the area have been awarded a Blue Flag for 2003, which is awarded for beaches that demonstrate high environmental standards and good sanitary and safety facilities, namely: Sheringham, Cromer, Mundesley, Sea Palling and Gorleston.

Visits to the area are mainly short term and weekend breaks, with the majority of visitors from the UK. They focus predominantly on the numerous beaches and important tourist towns and attractions although the area also attracts a diverse range of recreational pursuits including informal recreation such as watersports, fishing, horse-riding, cycling, walking and bird-watching.

Since the early 1970s, the seaside resorts of Great Yarmouth and Lowestoft have experienced a gradual decline in the long stay tourism market. Waveney District Council, in their strategic report on tourism (The Tourism Strategy), has identified a change in visitor expectations, with an emphasis on more quality and variety. Tourism plays an important role in the study area and is increasingly valuable to the local economy, both in terms of visitor spending and by providing employment opportunities.

The following amenities are present within the area: -

- Tourist Attractions
- Public Rights of Way
- Recreational Amenities, including:
 - Designated bathing beaches
 - Informal recreational pursuits
 - Formal recreational activities
- Holiday Accommodation:
 - Hotels
 - Bed and breakfast accommodation

- Flats and houses for rent
- Holiday Camps
- Chalet Parks
- Caravan Parks

Rental and self-catering holidays are popular in this area with most of the bed spaces being in static caravans and self-catering chalets. The serviced accommodation tends to be concentrated in Great Yarmouth, Lowestoft, Sheringham and Cromer. The non-serviced accommodation is generally located in the villages along the coast.

Policy HT1 of the North Norfolk structure plan states that the overall strategy for tourism is “to enhance the quality of tourist facilities and areas” and “maintain strict control in new development in order to conserve the undeveloped coast”. The North Norfolk Structure Plan also seeks to protect the amenity of coastal sites while encouraging access to the coast. The Suffolk Structure Plan identifies that “Tourism needs to develop in a way which avoids inappropriate pressure of visitor numbers or adverse landscape or amenity (e.g. noise) impacts of development such as golf courses or motor sports.”

D5.2.2 Features

(a) Kelling to Sheringham

There is very little development along this stretch of coastline, apart from the village of Weybourne, which is set back from the coast approximately half a kilometre, along the main coast road, the A149. There is a beach access point and car park at Weybourne, which is easily accessed from the A149. The Norfolk Coast Path runs along the coast. Agriculture is the main industry here and the agricultural land along this stretch is Grade 3. The National Trust owns a section of land and this is in stewardship or set-aside.

(b) Sheringham

Sheringham is a traditional seaside town, which includes a mixture of Victorian and Edwardian houses and fishermen's cottages. It is an important holiday and tourist centre, which is predominately focussed on the coastal activities; attractions include a variety of shops, galleries and boutiques, clean golden sandy beach (which was awarded a 2003 Blue Flag), North Norfolk Steam Railway, a 18 hole golf links set on the cliff top and 'The Splash' Leisure Complex. Windsurfing, surfing, canoeing and jet-skiing also takes place from the beaches.

Due to its landscape qualities it also attracts visitors interested in walking, horse riding and cycling, and the Norfolk Coast Path runs along the cliff top. This path, in conjunction with Peddars Way, contributes to the National Trail network of walkways and bridleways spanning the country. The North Norfolk Shoreline Management Plan's strategic objective for the Norfolk Coast Path is to maintain its integrity.

Associated with the tourist industry, the area contains both temporary and permanent caravan and campsites, together with a number of hotels. Although some of the businesses in the town are predominately focussed towards providing services for local residents, many are associated with the tourist industry.

Policy HT2 of the North Norfolk Structure Plan recognises Sheringham as a coastal holiday centre where tourist facilities and accommodation in permanent buildings will be permitted.

In terms of major non-tourist infrastructure, there is an inland rescue boat (IRB) station at Sheringham as well as the usual infrastructure elements associated with an urban area.

(c) Sheringham to Cromer

Between Cromer and Sheringham the cliff top land is predominately used for agricultural purposes, but there are also cliff-top caravan sites, which provide accommodation for visitors to the area. There are also car parks and beach access points along this section at West Runton and East Runton. These are particularly important for water-based recreation such as boating, non-commercial fishing, windsurfing and jet-skiing. Inland are the villages of West Runton and East Runton, which are predominately residential centres.

The National Trail continues along this frontage.

(d) Cromer

Cromer is an important tourist centre for North Norfolk, with attractions predominately being coast-based. The promenade and beach is a particular attraction and the beach was awarded a Blue Flag in 2003. The town offers a number of hotels and associated facilities such as restaurants, pubs and shops. The town also attracts visitors due to its landscape quality, featuring Victorian architecture along the frontage, a pier dating from the early 1900s and a Grade I church.

As well as the usual urban infrastructure, there is a RNLI lifeboat station at Cromer, which is part of a national network. The main coastal road, the A149 runs along this coastal frontage and is an important link to adjacent towns and one that would not be easily rerouted.

(e) Cromer to Overstrand

The main use of this coastal strip is the Royal Cromer Golf Course. There is also a cliff top footpath along this stretch.

(f) Overstrand

Overstrand is a quiet seaside village. Its main attraction is its beach and there are beach access points along the frontage, which lead down to the promenade. It is mainly residential but does include a couple of hotels, a caravan site and two corporate holiday institutions. Crab fishing represents a small industry at this location.

(g) Overstrand to Mundesley

The predominant use of the cliff top land is for agriculture and this is designated as Grade 3 farming land. The small village of Sidestrand is set a couple of hundred metres from the coast and contains a small number of mainly residential properties. The village of Trimingham is situated at the coast and again includes predominately residential properties. Both villages include churches, which have a heritage and landscape value as well as a community value. The coastal road between Trimingham and Mundesley runs along the cliff edge and is therefore potentially at risk. There is also an MOD

communications facility along this frontage, but this is a mobile facility, which could possibly be relocated if necessary.

(h) Mundesley (including Cliftonville)

Mundesley is a small holiday resort, which predominately attracts tourists to the beach, and during the summer Mundesley's population increases considerably. Mundesley has been awarded the Blue Flag for its waters and high standards. The town contains important tourist accommodation and facilities including a promenade, café and attractions, maritime museum, car parking areas and beach access points. There are also local community facilities such as churches and a library.

The cliff top Mundesley Holiday Camp and Hillside Chalet Park are very important tourist attractions and there is an access from these sites to the beach.

As well as the normal urban infrastructure, there is potential for loss of or damage to the AW outfall headworks. There is also a need to maintain access to outfall screens for Mundesley Beck. The coastal road that links Mundesley to coastal villages to the west is also potentially at risk. On the coast there is an IRB lifeboat station, which forms part of a network around the coast of the UK.

(i) Mundesley to Bacton

A key feature along this section is the Bacton Gas Terminal, which is an important feature both in terms of infrastructure and local employment. The terminal consists of subsurface pipelines to offshore gas field and cliff top sites with gasometers and communication towers. There are also impacts on communication linkages to and from the site. Between Mundesley and the terminal, the main land use is agricultural, with the land classified as Grade 1 quality.

(j) Bacton to Happisburgh

Bacton and Walcott are small settlements along this coastal stretch, which contain both residential and commercial properties. The beach is the main recreational attraction. There is a number of holiday developments and associated amenities spread along the main coastal road, the B1159, which runs along the coastal strip. There are also cliff top caravan sites at Bacton. To the south of Ostend and behind the villages is Grade 1 agricultural land.

(k) Happisburgh village

Happisburgh is a small village whose main centre is set back approximately a hundred metres from the cliff edge. It includes the Grade 1 St Mary's church, which is both a heritage feature and of community value. There is a cliff top caravan park fronting the main village and a road of both holiday and residential properties extend to the cliff edge; a number of properties have already been lost due to cliff erosion in recent years. There is access to the beach via steps, but these are a temporary response to recent cliff erosion along this frontage. The RNLI access point is currently not accessible and the crew now launches at Cart Gap.

(l) Happisburgh to Winterton-on-Sea (excluding the Broads)

There is a number of villages and individual farms immediately behind the seawall. Eccles is a small settlement which predominately includes the Bush Estate; a residential housing development.

Sea Palling is a popular resort and as well as residential properties it features holiday accommodation and camping and caravan sites. There are also tourist facilities including pubs, restaurants and cafés as well as amusement arcades. As well as the tourist attractions, the beach, and its easy access, is a key draw to the area and has recently been awarded the Blue Flag award. There are also launch facilities for pleasure craft and an IRB station.

Waxham is a small residential hamlet to the south; both Waxham and Sea Palling feature historic churches, which have both a heritage and community value.

There are also beach access points at Cart Gap, Sea Palling, Warren Farm and Horsey Corner, with a few additional beach access gaps elsewhere along this low-lying coast.

(m) Happisburgh to Winterton Broadlands

The boundary of the Broads extends beyond the landward limit of this SMP and is tightly drawn around the flood plains and lower reaches of the three main rivers: the Bure, Yare and Waveney. Encompassing an area of 303km² (draft Broads Plan 2004, Broads Authority website), the Broads is Britain's largest nationally protected wetland. The Broads is also one of Europe's most popular inland waterways and attracts more than a million visitors a year; it has been estimated that in 1998 the value of tourism in the Broads represented nearly 10% of tourist spend in the East of England (Broads Authority website). The area supports a number of activities including: canoeing, walking, cycling and angling. There is a number of villages and isolated farms within the Broads area, which include both residential properties and holiday accommodation. Associated with these villages there is a complex network of roads and services.

(n) Winterton-on-Sea

Winterton is a coastal village, which features mainly residential properties and shops, but also has some tourist accommodation. The Winterton Valley Estate, to the south, provides self-catering static holiday accommodation. The key attraction is the tranquillity and naturalness of the dunes and beach. Recreational walkers and ornithologists are also attracted here by the important birdlife.

There is a beach access and car park within the dunes, however the coastguard station was removed in Winter 2003/4 due to erosion of the dunes.

(o) Newport and Hemsby

At Newport and Hemsby the key purpose of the coastal strip is as a tourist destination. There is a number of amusement arcades and pubs and restaurants running down to the coast. The Pontins Holiday Centre at Hemsby, which consists of a comprehensive range of on-site facilities and entertainment, is an important contributor to the economy of the Borough. The beach is an important attraction and is easily accessed at this location. There is also an IRB station, which serves this beach. Along the coastal strip there are both residential and holiday cottages and holiday developments.

(p) Scratby and California

These two settlements include both residential and holiday accommodation and there are also recreational and leisure facilities. The main tourist accommodation centres are Beach Road Chalet

Park at Scratby and California Cliffs Caravan Park at California. There is access to the beach at California Gap.

There is also a short stretch of agricultural land between California and Caister-on-Sea.

(q) Caister-on-Sea

Caister is a coastal town, which supports, particularly along the seafront, a large number of holiday properties and holiday developments, including large caravan parks. The main tourist accommodation centres are the Haven Holidays Chalet Park and Silver Sands Holiday Village. The main commercial centre is several hundred metres inland and features both tourist facilities and local businesses. There are car parks to both the north and south of the town, with a number of beach access points along the frontage. There is also an IRB station on the seafront.

(r) Great Yarmouth

Great Yarmouth is a large seaside town and is Norfolk's largest resort featuring a wide range of tourist attractions; it is one of the most popular tourist attractions on the east coast of England. There is a number of car parks along the frontage and various beach access points. The promenade is a key attraction and is known as The Golden Mile with its many facilities including two piers, bowling greens, sea life centre and amusement arcades. This is supplemented by the piers, Wellington Pier and Britannia Pier, and the Pleasure Beach fun fair. The beach also remains a key tourist feature. Other attractions include the Race Course and Golf Course at North Denes. There are numerous seafront hotels and holiday accommodation.

As well as being a tourist centre, the town performs both a commercial and residential function and is second only to Lowestoft, in terms of population, within the SMP area.

The port of Great Yarmouth is a fully-functioning port and the turnover 2000 and 2005 was generally constant in the range £4 to £4.5 million (GYPA website). Since the decline of the fishing industry, Great Yarmouth has become a major base for the offshore exploration for oil and gas and is the principal UK base for the offshore oil and gas industry in the Southern and North Sea. The Outer Harbour has recently been completed, which provides a new deepwater harbour, which will allow fast ferries to service Great Yarmouth.

In terms of other infrastructure the beach road is a key link for tourist attractions along the promenade and part of the local road network. This runs along the back of the promenade.

(s) Gorleston

The Blue Flag beach at Gorleston-on-Sea is a key attraction and activities include bathing, wind surfing, yachting and jet skiing. There is also a number of beach-side shops. On the cliff top there is a number of additional tourist attractions including gardens, bowling greens and tennis courts. The resort also has its own theatre, nightspot, a casino, bingo hall, pitch and putt, golf course and amusement park. There is a range of holiday accommodation. Gorleston also has a substantial residential area, with a number of cliff top properties, and supporting community facilities.

In addition to the usual infrastructure features, there is a pumping station and sewer. Car parks are situated to the north and south of the seafront, but there is a number of pedestrian beach access points down the cliffs.

(t) Gorleston to Corton

Between Gorleston and Hopton is the Gorleston Golf course, which extends up to the cliff edge. The village of Hopton is also a popular holiday destination; here there is a cliff top caravan park, the Hopton Holiday Village, which fronts the village of Hopton. For much of the frontage the main residential and commercial properties of Hopton are a couple of hundred metres inland from the cliff edge. To the south of the Holiday Village there is a number of properties close to the cliff edge.

Between Hopton and Corton the land is used for agriculture and is classified as Grade 2 agricultural land. There is a number of informal vehicular beach access points. Towards Corton there is a cliff top holiday development, Broadlands Sand Holiday Centre.

(u) Corton and Gunton

Corton village is a popular holiday centre and holidaymakers swell the village population by more than 600 each week in the summer. There are two holiday villages in Corton, which are situated along the cliff top, and a number of associated facilities. The beach and the proximity of the nature reserves of Corton Woods and Gunton Warren is a key attraction. The beach and Gunton Warren are both popular for recreation and tourism and there is also an official naturist beach along this stretch. There are three main beach access points at Bakers Score, Tibbenham's Score and Tramps Alley. As well as tourist facilities there are also a few local businesses, which serve the residential properties.

To the south of Corton, inland of Gunton Warren and approximately 300m from the cliff edge, is New Pleasurewood Hills Family Theme Park, which is one of East Anglia's premier amusements parks (approximately 262,000 visitors in 2000; New Pleasurewood Hills website).

A coastal link road between Corton and Lowestoft runs within a hundred metres of the cliffs at Corton.

(v) Lowestoft

Lowestoft is the largest town within the SMP area and extends beyond the boundary of this SMP study area. It is important both as a commercial and tourist centre. Most of the tourist attractions, facilities and accommodation are located close to the coast, as the beach remains the key attraction. The town is also famous because Lowestoft Ness is Britain's most easterly point, as marked by the Euroscope, which is also the southern boundary of the SMP. Apart from the Euroscope, the majority of tourist attractions are to the south of the Harbour, i.e. outside the SMP area. To the north, the primary land use of the coastal strip is light industry, including the Birds Eye factory. The main exceptions are the Denes Oval Recreation Ground, the Denes camping and caravan site and another caravan site immediately to the south, and the maritime museum.

There are the usual infrastructure features, but in addition there is a sewage pumping station and headworks, together with sewage rising mains and treated water return pipes. At Ness Point, there is a gas mains and gas holder. There is a number of car parks along the frontage and various beach access points.

Planning permission has been granted for the development of a wind turbine just south-west of Ness Point.

D5.3 FUTURE LAND USE/PLANNING/TARGETS AS SET BY LOCAL PLANS ETC.

D5.3.1 Overview

The purpose of this Section is to identify proposals for development in the coastal zone that are contained in Structure and Local Plans.

D5.3.2 By area

(a) North Norfolk District

The Norfolk Structure Plan (1999) states that provision will be made for about 7,300 new dwellings in the North Norfolk district in the period 1993 to 2011. However, the North Norfolk Local Plan (1998) stated that, in effect, the figure of 8,700 housing, which was quoted in the previous Structure Plan (1993), had already been “*comfortably exceeded*”. No ‘Growth Towns’ have been identified within the SMP area (Policy 1). In the towns of Cromer and Sheringham (amongst others), further provision for housing may “*only be made where this improves the balance with jobs and services locally*” (Policy H.5 of the Structure Plan, Policy 2 of the Local Plan). It is the Council’s desire to “*conserve and small-town character*” of these settlements. Development in Mundesley will be permitted “*provided that they are compatible with the existing character of the settlement as a large village*” (Policy 3 of the Local Plan).

A number of small villages have been identified as ‘Areas of Development Restraint’, where “*small-scale development proposals for housing, employment and other appropriate purposes will be permitted provided that enhance the existing character of these small villages*” (Policy 4 of the Local Plan). These selected small villages include: Bacton, East Runton, Happisburgh, Overstrand, Potter Heigham, Sea Palling, Trimmingham, Upper Sheringham, West Runton and Weybourne.

There are also development constraints for the countryside that surrounds the towns and villages (Policy 5 of the Local Plan). Walcott and Bush Estate, Eccles will be subject to this Policy, rather than Policy 4, i.e. further development at these locations will not be encouraged.

In addition to the above, Policy 25 of the Local Plan states that proposals that do not require a coastal location, or would be detrimental to the appearance or character of the area, will not be permitted in the ‘Undeveloped Coast’.

Bacton Gas Terminal is a notified hazardous installation and a ‘Major Hazard Zone’ (MHZ) has been identified. Due to the risk, development that increases the population within this zone will not be permitted, regardless of its location (Policy 55 of the Local Plan).

(b) Great Yarmouth Borough

The Norfolk Structure Plan (1999) states that land will be provided for about 4,700 new dwellings in the Great Yarmouth area over the period 1993 to 2011. It is the policy of the Great Yarmouth Borough-Wide Local Plan that all new housing developments should be located, as far as is practicable, close

to the main urban areas of Caister, Great Yarmouth and Gorleston (and Bradwell). Smaller-scale housing developments of 10 dwellings or less are proposed at Ormesby St Margaret and Winterton.

In terms of industry and employment, the plan identifies that the major part of the requirement for employment land will be met by the provision of a landscaped business park at South Gorleston for which outline planning permission has been granted, in principle, and will be renewed, as necessary, during the timescale of the plan. The Borough Council Port Authority and Norfolk County Council are jointly working to achieve a long-standing proposal to develop an Outer Harbour. The Great Yarmouth Outer Harbour Act (1986) empowers the Port Authority to undertake an eastward expansion of the existing harbour and the development, which, when complete, will cover an area of 40.5 hectares and will be used for port and port-related purposes.

The Local Plan also restricts the development of further tourist facilities and states that outside the existing prime commercial holiday areas, development that involves the erection of buildings and structures will not be permitted within the coastal area east of the A12, A149 and B1159. The plan also states that the existing provision and distribution of amusement/video arcades is considered adequate for the needs of residents living in the urban area and larger villages.

(c) Waveney District

Suffolk Structure Plan (June 2001) proposes that 6,700 new homes should be built in Waveney District between 1996 and 2016; this equates to 335 homes per annum. The settlement strategy identifies that most new development in Waveney will take place in urban areas, with Lowestoft identified as the most sustainable location. Outside the main towns, development will be more restrictive than in the past but there may be limited development opportunities in some larger villages including Corton.

Future regeneration activity is likely to be concentrated on Lowestoft for the foreseeable future, although much of this investment is likely to be to the south of the harbour (i.e. outside the SMP area).

The Suffolk Structure Plan, supports tourism development throughout the county, whilst seeking to minimise harm to environmental quality and the adverse social effects arising from tourist activity. Subject to certain criteria, policies permit the development of tourist accommodation and facilities, especially in Lowestoft but also in towns and villages.

(d) Broads Authority executive area

A Broads Plan is due for publication in February 2003, which sets out a 5-year plan and 20-year (termed 'long-term') aims. Guiding Principle 11 states "*development on the flood plain will only be allowed if it is essential for the social and economic well-being of the community and appropriate to the character of the landscape and risks from flooding*". An aim for the next 20 years highlighted in the Plan is "*a more naturally functioning flood plain of extensive and connect habitats, providing an essentially open landscape interspersed with rivers and lakes*" with "*arable land ... no longer a significant part of the Broads landscape*" whilst "*maintain(ing) the character of the Broads landscape*".

D6 Sources of Information

REPORTS

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Happisburgh to Winterton Sea Defences: Stage Three Strategy Review. Appendix G. Halcrow, 2002.

Caister Beach Coast Protection. Environmental Appraisal. Halcrow, 1997.

Gorleston to Lowestoft Coastal Strategy Study (Halcrow). Part 1, Appendices A to C.

Annual Eastern Sea Fisheries Joint Committee Reports; 2001, 2002, 1998 and 1999.

WEB SITES AND ADDITIONAL INFORMATION

North Norfolk District Council Local Plan (www.north-norfolk.gov.uk/planning)

Waveney District Council Draft Local Plan (www.waveney.gov.uk/services/planning/local_plan)

Great Yarmouth Borough-Wide Local Plan (www.great-yarmouth.gov.uk)

Broads Local Plan (www.great-yarmouth.gov.uk)

Norfolk County Council Structure Plan (www.norfolk.gov.uk/environment/planning/landuse)

Suffolk County Council Structure Plan (www.suffolkcc.gov.uk/e-and-t/structure_changes/adopted_structure_plan)

Norfolk County Council population estimates (www.norfolk.gov.uk/council/statistics/demography)

Suffolk County Council population estimates (www.suffolkcc.gov.uk/cgi-bin)

English Nature (www.english-nature.org.uk)

Norfolk Wildlife Trust (www.wildlifetrust.org.uk/norfolk)

Suffolk Wildlife Trust (www.wildlifetrust.org.uk/suffolk)

Biodiversity Habitat and Species Action Plans (www.norfolkbiodiversity.org)

Norfolk Coast AONB (www.norfolkcoastaonb.org.uk)

CHaMPs (www.english-nature.org.uk/livingwiththesea/champs/pilots.asp)

Economic Strategies for Norfolk and Waveney (www.shaping-the-future.org)

Great Yarmouth Port Authority (www.gypa.co.uk)

Broads Authority (www.broads-authority.gov.uk)

MAGIC (Multi-Agency Geographic Information for the countryside) (www.magic.gov.uk)

Annex D1 Biodiversity Action Plans

The National Biodiversity Action Plan includes both Habitats and Species Action Plans.

HABITAT ACTION PLANS

Below is a list of Species Action Plans that apply to the SMP area (excluding Breydon and Oulton):

- **Coastal and floodplain grazing marsh**
- **Maritime cliff and slope**
- **Coastal vegetated shingle**
- **Littoral chalk**
- **Coastal sand dunes**
- Reedbeds
- Lowland heathland
- Fens (in Broadland)
- Mesotrophic lakes (in Broadland)
- Cereal field margins

SPECIES ACTION PLANS

Below is a list of Species Action Plans that apply to Norfolk (although some are not present in the SMP area). (These Action Plans are currently under review):

(a) Mammals

Species	Norfolk Status	Habitat
Water vole (<i>Arvicola terrestris</i>)	Throughout county but distribution patchy. Main stronghold in Broads.	Dykes, streams and rivers.
Brown hare (<i>Lepus europaeus</i>)	Perhaps as numerous in Norfolk as any county, and relatively abundant in some areas such as north Norfolk.	Arable farmland and grazing marshes.
Otter (<i>Lutra lutra</i>)	Occurs in most river catchments. Population is showing signs of increase.	Rivers and lakes.
Harbour porpoise (<i>Phocoena phocoena</i>)	Small numbers occur annually.	Coastal waters.

(b) Birds

Species	Norfolk Status	Habitat
Skylark (<i>Alauda arvensis</i>)	Widespread breeding bird and winter visitor despite likely decline.	Arable farmland and rough grassland.
Bittern (<i>Botaurus stellaris</i>)	A very few pairs breed along the north Norfolk and in the Broads. Some winter visitors.	Large reedbeds.
Stone curlew (<i>Burhinus oedichnemus</i>)	Majority of UK pairs in Brecks, a handful of pairs in north-west Norfolk.	Arable land on light soils and heathland.
Grey partridge (<i>Perdix perdix</i>)	Patchy distribution often associated with light soils. Norfolk has always been an important area.	Farmland.
Song thrush (<i>Turdus philomelos</i>)	Relatively high numbers in Norfolk.	Farmland, woodland parks and gardens.

(c) Amphibians

Species	Norfolk Status	Habitat
Great-crested newt (<i>Triturus</i>)	Thinly distributed in Breckland, mid, and	Ponds.

cristatus)	south Norfolk. Major decline in Broads.	
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(d) Butterflies

Species	Norfolk Status	Habitat
Large copper butterfly (<i>Lycaena dispar</i>)	Former range included Norfolk.	Fens.

(e) Crustaceans

Species	Norfolk Status	Habitat
White-clawed crayfish (<i>Austropotamobius pallipes</i>)		Clean, flowing water.

(f) Molluscs

Species	Norfolk Status	Habitat
Little-whirlpool ram's-horn snail (<i>Anisus vorticulus</i>)	Four sites in Broads, one on North Norfolk coast and STANTA in Brecks.	Unpolluted calcareous water in well-vegetated marsh drains.
Depressed river mussel (<i>Pseudanodonta complanata</i>)	Yare, Wensum, Waveney and in western rivers.	Sediments in slow rivers.
Shining ram's-horn snail (<i>Segmentina nitida</i>)	Broads and Thompson Common.	Ponds and drains with unpolluted calcareous water.
Narrow-mouth whorl snail (<i>Vertigo angustior</i>)	A few sites in Broads and East Anglian Plain Natural Area.	Marshes including saltmarsh.
Desmoulin's whorl snail (<i>Vertigo moulinsiana</i>)	Increasing number of sites in many river systems.	Tall swamp vegetation.

(g) Sea Anemone

Species	Norfolk Status	Habitat
Starlet sea anemone (<i>Nematostella vectensis</i>)	Numerous in a very few coastal lagoons.	Saline lagoons.

(h) Worm

Species	Norfolk Status	Habitat
Medicinal leech (<i>Hirudo medicinalis</i>)	Recently known from Stalham, but now thought to be extinct.	Ponds.

(i) Fungus

Species	Norfolk Status	Habitat
Sandy stilt-puffball (<i>Battarraea phalloides</i>)	First described from Norfolk (1782). Seen sporadically since. Now at two or three sites.	Roadside verges on light soils.
Nail fungus (<i>Poronia punctata</i>)	Last recorded at Holme. Possibly extinct.	Unimproved grassland hay meadows.

(j) Lichen

Species	Norfolk Status	Habitat
Starry breck-lichen (<i>Buellia asterella</i>)	Now only one UK site in Brecks.	Grazed Breck heath.
Orange-fruited elm-lichen (<i>Caloplaca luteoalba</i>)	Has been recorded at six sites. Now only known from one.	Roadside and parkland trees.

(k) Liverwort

Species	Norfolk Status	Habitat
Norfolk flapwort (<i>Leiocolea rutheana</i>)	Recorded at six or seven sites, but now only known at one.	Calcareous flushes on fens.

(l) Mosses

Species	Norfolk Status	Habitat
Slender green feather moss (<i>Hamatocaulis vernicosus</i>)	Only one confirmed site in Norfolk.	Sedge fen.

(m) Vascular Plants

Species	Norfolk Status	Habitat
Ribbon-leaved water-plantain (<i>Alisma gramineum</i>)	Discovered in 1972 at Langmere, thought to have been introduced by ducks. Now extinct.	Still waters.
Fen orchid (<i>Liparis loeselii</i>)	Three sites.	Mown fens.
Floating water-plantain (<i>Luronium natans</i>)	Introduced; a small stable population near Potter Heigham.	Dykes.
Holly-leaved naiad (<i>Najas marina</i>)	A few sites in the Broads, its only UK area.	Broads and newly-created turf ponds.

Annex D2 Maps

This Annex includes maps of the following:

- Nature conservation designations (7 maps)
- Landscape designation (1 map)
- Heritage designations (7 maps)
- Agricultural Designations (1 map)