

1.10 BROAD CHARACTER: CULTURAL TOPOGRAPHY

1.10.3 CHARACTER TYPE: CULTURAL TOPOGRAPHY (INTER-TIDAL)

REGIONAL PERSPECTIVE: EAST ANGLIA

INTRODUCTION: DEFINING/DISTINGUISHING ATTRIBUTES

The inter-tidal areas of this region are extensive and varied in nature, comprising significant zones of saltmarsh, sand and mudflats as well as sandy and shingle foreshore. The sheer size of the former elements is in part due to the punctuation of the shoreline in this area by a series of large estuaries; Breydon Water in Norfolk, the Blyth, the Alde/Ore/Butley, the Deben, Orwell and Stour in Suffolk and Hamford Water in Essex.

The open shoreline comprises sandy foreshore to the north and south of the study area, in places in the north this is mixed with shingle. The central area, however, is particularly well known for its shingle foreshores and spits, mainly composed of flint shingle. Suffolk alone contains 859 ha of vegetated shingle. This is mainly due to the presence of Orfordness, Europe's largest vegetated shingle spit at c 16 km long. Other significant areas of vegetated shingle include Benacre Ness, Landguard Point, Thorpeness Haven and Shingle Street.



Sandy foreshore

1.10.3 CHARACTER TYPE: CULTURAL TOPOGRAPHY (INTER-TIDAL)

Mudflats and sandflats are found in most sheltered areas of the coast, but most significantly in the estuaries. This is particularly notable in the wide bays of the Stour which contains c. 16.5 square km of intertidal flats, generally muddy but becoming sandier downstream. Holbrook Bay alone contains mudflats up to 1.5 km wide. Mudflats and sandflats are also present in Breydon Water, the Blyth, Alde/Ore, Deben and Orwell as well as Hamford Water, although not in such quantity.



Mudflats in the Stour estuary

Saltmarshes is found throughout the study area, with significant expanses in Hamford Water (c. 800 ha or one third of the total area) and the Alde/Ore estuary (c 334 ha). Saltmarsh is also present in stretches of Breydon Water, the Blyth, Deben, Stour and



Saltmarsh near Waldringfield on the Deben Estuary

Orwell estuaries as well as Orfordness. The extent of the saltmarsh varies for area to area. For example 1.07 square km of saltmarsh exists along the entire length of the Stour from Parkeston Quay to Manningtree, largely 50-100 m wide but up to 600 m wide in Copperas Bay (Defra 2002). In the adjacent Orwell saltmarsh is restricted to four areas; Cranes Hill, Levington Creek, Colton Creek and Pin Mill.

HISTORICAL PROCESSES; COMPONENTS, FEATURES AND VARIABILITY

The nature and location of the landscape features included within this character type arise ultimately from the action and interaction of natural and human processes, a process that continues into the present day.

The underlying geology is a significant contributory factor to the landscape character of the region. This comprises Eocene rocks, overlain by a London Clay, a sequence of Quaternary sands and gravels, Holocene sands and muds. Much of the sand found on the foreshore today is created through erosion of the Red Crag cliffs (see Cultural Topography (landward)). This process is the result of a number of factors including weathering and poor drainage but has been exacerbated in recent years by increasing sea level rise, now generally viewed as one outcome from the climate change effects of human activity and processes such as harbour dredging.

The shingle structures of Orfordness and Benacre ness have been shaped over long periods of time. Orfordness, for example probably began to form after sea level rise started to slow several thousand years ago (see Palaeolandscape component) through the gradual inshore movement of sediment (Defra 2002 appendix a). The formation of the spit visibly gained momentum after the 12th century as eroded material was pushed southwards via currents and longshore drift. At the time of its construction (1165-1167) Orford castle was probably built on the end of the spit, overlooking the harbour, but now lies some 2 km inland. Documentary and cartographic evidence suggests the spit may have grown at around 13 km per year between the 12th and 19th centuries (Williamson 2005, 130) reaching its present length by the 1800s. This growth is recorded on the ness by a series of ancient shorelines preserved as shingle ridges with intervening lows (Defra 2002 appendix a). Both spits are still actively moving through a combination of erosion and deposition largely related to the estuaries (ibid). Benacre Ness is now more mobile, having migrated northwards at an average rate of 22 m per year over the last 200 years (ibid).

The estuaries and consequently the majority of inter-tidal deposits are also subject to extensive processes of change, all of which are related to the shingle spit formation discussed above. The connection between the two sub-types is exemplified by the area around Breydon Water/the Broads. This was originally a large complex consisting of the Hundred, Yare and Waveney Rivers, all with their own estuarine systems surrounding two islands - Flegg to the north and Lothingland to the south (now the locations of Great Yarmouth and Lowestoft respectively). During the Roman and Anglo-Saxon periods these were utilised and defended as harbours until shingle spits began to form across the estuary mouths and all three were diverted into Breydon Water (Malster 2003). Shingle spits are also known to have blocked a number of prosperous medieval harbours in the area (see Ports and Docks).

As outlined above saltmarsh and inter-tidal mud/sandflats are found in sheltered tidal zones. Saltmarsh develops on soft sediments which are only inundated by the highest tides allowing the establishment of salt tolerant vegetation (Williamson 2005, 27). As such these features are generally, although not exclusively, found in the estuaries of the region and behind the extensive spits. For example, vast saltmarsh was formed by the diversion of the Alde by Orford Ness.

1.10.3 CHARACTER TYPE: CULTURAL TOPOGRAPHY (INTER-TIDAL)

Development and survival of inter-tidal flats is therefore partially dependent on human management of the estuaries and land use. In the medieval and post medieval periods vast amounts of saltmarsh were converted to grazing land through drainage and large-scale reclamation. In more recent years the construction and maintenance of flood and erosion defences, partially to protect reclaimed land has influenced the development and loss of intertidal flats and saltmarsh.

This process is particularly well exemplified by one of the region's best known and (at least for a time) iconic archaeological sites, the so-called Seahenge of Holme-on-Sea. This monument (called after its better known sister Stonehenge) appears to have been originally constructed on a salt marsh which over the centuries became a freshwater wetland, as an offshore barrier grew up, preventing sea water from getting access to the area around the circle. The monument became covered and preserved in the resulting peat layers until, with rising sea levels in later millennia, the sea advanced, and eventually sand began to cover the peat. Through this process, Seahenge eventually found itself from once being inland to being on the beach, where it was revealed by the eroding away of the sand and peat in the late 20th century, four thousand years since its original construction (<http://en.wikipedia.org/wiki/Seahenge>). The site constructively exemplifies a range of rivalling aspirations and perceptions of the area and its character elements representing (according to the community that you identify with) a tourist attraction, a ritual or sacred site, a local amenity and a portable archaeological artefact .

Currently the Blyth, Alde/Ore and Deben are strongly constrained by man, although the Alde/Ore is also largely related to the development of Orfordness. The spit has gradually forced the mouth of the estuary southwards for more than 12 km, forcing the river to run parallel with the coast and allowing the development of mudflats some way inland (Williamson 2005, 131; 2006, 18). Human exploitation and experience of these areas (more fully discussed in the Values and Perceptions section below) has seen a variety of manifestations in the past and so into the future: areas have been used as grazing, as holiday or recreational destinations and as the setting of a variety of books and plays.



Mudflats on Orfordness

VALUES AND PERCEPTIONS

Intertidal landscapes in the East Anglian region are highly valued for their ecological biodiversity and many areas have been given protected status as habitats for wildfowl, wading birds and other wildlife (see below). In addition, and partly as a result of this, the inter-tidal features have become a recreational and tourist attraction. This includes a variety of landscape types from the sandy beaches of Great Yarmouth and Clacton to the wild estuarine landscapes of the Stour and Alde/Ore. The latter are particularly popular with walkers and wildlife enthusiasts.

The intertidal areas are also ingrained in the psyche of locals and holiday makers for their literary and cultural values. For example, Hamford Water, consisting of over 2000 hectares of generally inaccessible tidal creeks and islands, saline lagoons, intertidal mudflats, sandflats and saltmarsh is well known as the setting for Arthur Ransome's novel 'Secret Water'. This was the eighth book of the popular Swallows and Amazons children's series, published in 1939.

The often bleak and isolated estuarine areas have become the atmospheric backdrop for numerous ghost stories by a variety of authors including MR James (most notably perhaps his haunting 'Oh Whistle and I'll come to you, my lad' based upon an eroding beach in the Region) and Susan Hill's 'The Woman in Black'. Other writers who have made good use of the areas include PD James in a series of murder and suspense stories centred around the bleak beaches and estuaries of the region and Barbara Erskine in her novel 'Hiding from the Light' based upon the 17th century witch trials conducted by local resident Matthew Hopkins.

In recent years the inter-tidal areas of East Anglia have also been specifically perceived as valuable to the archaeological community for their wealth of archaeological remains. These include wooden structures such as fish traps, quays, jetties and hulks, as well as evidence of early prehistoric occupation in the form of stone tools and scattered features. Perhaps the most remarkable of these intertidal archaeological sites is the so-called 'Seahenge', a preserved timber circle, once located in an inland salt marsh and finally left exposed by the incoming tides and eventually spirited away in the teeth of local and pagan opposition.

RESEARCH, AMENITY AND EDUCATION

This character type has enormous research value and educational potential. This applies to both the ecological and archaeological aspects. In particular, habitats such as vegetated shingle and inter-tidal flats attract unusual species of flora and fauna and can provide sanctuary for important bird populations. Areas of significance include Orfordness and Hamford Water/Walton Backwaters.

In archaeological and historical terms the value of inter-tidal areas has recently been highlighted for a variety of reasons. Firstly the inter-tidal zone is likely to be a 'hotspot' for the presence of palaeolandscape components. This is particularly applicable to Mesolithic landscapes as availability of protein was often higher close to the open water and shores at this time, and settlement sites were often adjacent to wetlands and estuaries (Fleming 2002). Therefore, the potential for such sites is high around the shorelines and rivers at each date, especially where shorelines were constant for hundreds or thousands of years (ibid).

1.10.3 CHARACTER TYPE: CULTURAL TOPOGRAPHY (INTER-TIDAL)

Secondly the waterlogged condition of many inter-tidal deposits such as mudflats and saltmarsh encourages the survival of organic material such as wood, thereby increasing the likelihood of finding structures such as hulks, quays, fishtraps and even the odd timber circle. Other features likely to be present in the inter-tidal zone include industrial remains such as saltworking sites, oyster cultivation pits and military structures.



A hulk in saltmarsh on the River Deben

CONDITION AND FORCES FOR CHANGE

Inter-tidal sub-types are often dynamic areas of landscape as a result of their position in a zone which is subject to tidal inundation. There are a series of forces for change of these features, both natural and man-made.

The net wave energy direction to the coast is from the east and the 'natural' sediment drift for this area of coastline is to the south (Defra 2002 appendix a). As such material is eroded from some areas of the open coast and deposited in others. For example material is eroded from the cliffs between Lowestoft and Benacre and deposited at Benacre Ness. The shingle spits are continually moving as a result of these processes, with the southern end of Orfordness varying almost week by week and Benacre Ness slowly moving northwards.

This also has implications for the estuaries which can act as sediment sinks, in addition shingle and sediment can restrict the width of channels and estuary mouths allowing extensive intertidal deposits to develop where tides cannot reach. The process of coastal squeeze described above can counteract this, although the situation is often more complicated. For example The Orwell is generally accreting, though saltmarsh erosion is still taking place (Hutchinson Ports (UK) 2003, 118).

Human action further interacts with this system, with erosion increasing due to climate change and sediment patterns disturbed by processes such as harbour dredging. Some activities can more directly threaten intertidal deposits such as pressure for development.

However, more positive forces for change have become significant in recent years as more action is being taken to preserve inter-tidal deposits and prevent erosion with a number of areas along this stretch of coast have been designated as important and protected.

RARITY AND VULNERABILITY

Many of the inter-tidal character types in the East Anglian region are recognised as rare or significant. Shingle structures sufficiently stable to support perennial vegetation are a rare feature in the UK (with approximately 20% of the national resource represented in Suffolk alone, (<http://www.nationaltrust.org.uk>) and support a diverse and characteristic plant and invertebrate community. Orfordness is the second largest vegetated shingle structure in UK and home to rare undisturbed vegetation communities and nationally important breeding tern populations. It is currently a national nature reserve, owned by the National Trust. Saltmarsh and mudflats can also provide significant habitat for unusual flora and important populations of birds. RSPB nature reserves are located at Aldeburgh, Orford, and Minsmere, and the area is renowned for its numerous butterflies and wild flowers.



Vegetated shingle at Shingle Street

1.10.3 CHARACTER TYPE: CULTURAL TOPOGRAPHY (INTER-TIDAL)

This importance is recognised all along the coast by numerous designations. The entire region from Lowestoft to the river Stour is classed as an Area of Outstanding Natural Beauty (AONB), large zones of which are inter-tidal salt marsh and mudflats. This area is also known as the Suffolk Heritage Coast a classification designed to protect coastlines of special scenic and environmental value from undesirable development. There are several SSSIs within the study area, most are recognised for their diversity of habitats with varied plant and animal communities including nationally sparse species. This includes Shingle Street and the Landguard Peninsula due to the number and quality of shingle-dwelling plant species and their importance as a land-fall site for migrating birds. Leiston to Aldeburgh and the Sizewell marshes are SSSIs for their marsh components and diverse plant and animal communities including nationally sparse species.

International designations are also found across the region, most notably within the estuaries as a result of the extensive inter-tidal mudflats and saltmarsh which provide habitats for bird populations and benthic communities. Breydon Water, the Alde-Ore, Deben, Stour and Orwell estuaries as well as Hamford Water all have status as Special Protection Areas (SPA) and RAMSAR sites (internationally significant wetlands). The Alde-Ore-Butley complex is also a Special Area of Conservation (SAC) as a result of its saltmarsh component (37% of the entire resource in the county).

The protected areas also include the Minsmere to Walberswick marshes (SPA/RAMSAR) incorporating the Blyth estuary, The Minsmere levels RSPB nature reserve is home to breeding marsh harriers, one of Britain's rarest birds of prey (Edwards 1991, 94). Westwood marshes is famous for freshwater reed beds used for thatching and cover for birds. The Blyth estuary, heavily constrained in places and large intertidal areas in others, supports nationally and sometimes internationally important populations of wintering wildfowl (English Nature 1997).

Hamford Water/Walton backwaters is a particularly special area as a result of its unusual conditions behind a sand spit, different to the adjacent estuaries or open sea. Consequently the area supports unusual assemblages of invertebrates and plants such as hogs fennel and rare rock sea lavender, as well as ragworms and mussels. The area is probably most significant as a refuge for birds, and is designated an SPA due to its populations of Avocet, Golden Plover, Ruff, Little Tern, Dark-bellied Brent Goose, Teal, Black-tailed Godwit, Redshank and Ringed Plover. Two of the larger islands are notable wildlife havens. Horsey Island is the largest, accessible by road at low tide and supports a colony of over 70 harbour seals and grey seals; Skippers Island is a protected bird sanctuary.

Much of the intertidal land in the area is under pressure from various forces of change and is therefore vulnerable. This is ultimately related to ongoing sea level rise and erosion along the coastline, as described above, exacerbated by human intervention such as dredging and natural factors like increased storminess. Orfordness, for example, is currently eroding to the extent that the lighthouse, dating from 1792, is expected to be lost within c 5 years.

However, the most vulnerable aspect of the landscape is saltmarsh. A study by the University of Newcastle showed that 93 ha of salt marsh was lost from the Suffolk estuaries in the preceding 27 years, 80 % due to coastal squeeze (2000). The Environment Agency has estimated sea level rise to continue at a rate of 6 mm per year; extrapolation of recorded rates of loss suggest no salt marsh would remain in Hamford water by 2050 (Defra 2002). Although this would be accompanied by some increase in mudflats, this would have a number of ecological implications.

BIBLIOGRAPHY

- Department for Environment Food and Rural Affairs, 2002, *Suffolk Coast and Estuaries Coastal Habitat Management Plan Final Report*. Defra
- Erskine, B., 2003, *Hiding from the Light*, HarperCollins
- Edwards, R., 1991, *The Suffolk Coast*. Terence Dalton Ltd
- English Nature, 1997, *Suffolk Coast Maritime Natural Area Profile*. English Nature
- Fleming, N.C. 2002, *The scope of Strategic Environmental Assessment of North Sea areas SEA3 and SEA2 in regard to prehistoric archaeological remains*. Department of Trade and Industry
- Hutchinson Ports (UK) Ltd, November 2003. *Felixstowe South Reconfiguration Environmental Statement*. Hutchinson Ports (UK) Ltd.
- Malster, R. 2003. *The Norfolk and Suffolk Broads*. Phillimore.
- Ransome, A., 1939, *Secret Water*, Jonathan Cape Children's Books
- University of Newcastle. 2000. *Erosion of the Saltmarshes of Essex Between 1988 and 1998*. Unpublished report to Anglian Region Environment Agency. Coastal Geomorphology Partnership, University of Newcastle, Newcastle, UK.
- Williamson, T., 2005, *Sandlands: the Suffolk coast and heaths*. Windgather
- Williamson, T., 2006, *England's Landscape: East Anglia*. English Heritage

Websites

(<http://www.nationaltrust.org.uk>)