

## 1.10 BROAD CHARACTER: CULTURAL TOPOGRAPHY

### 1.10.4 CHARACTER TYPE: CULTURAL TOPOGRAPHY (MARINE)

#### REGIONAL PERSPECTIVE: EAST ANGLIA

#### INTRODUCTION: DEFINING/DISTINGUISHING ATTRIBUTES

The marine cultural topography in the area is clearly linked to the substrate and drift geology of the region. The underlying geology in this area is dominated by silty clays, sandy silts and sands of the Palaeogene London Clay Formation, Woolwich Beds and Thanet Formation (BGS 1989). The superficial geology comprises sand and gravelly sand throughout with pockets of gravel, sandy and gravelly mud notably clustered in the south around the entrance to Harwich Haven. Overall the North Sea is c 20-40 m deep in this area. The seabed in this area is mainly a thin, superficial layer of diverse sediments and exposed bedrock, with a variety of small and large-scale bedforms, including sandbanks, sub-marine dunes and sand patches (Sturt and Dix 2009, 12), overlying exposures of Quaternary, Cenozoic and Cretaceous sediments (Sturt and Dix 2009, ix). These bedforms can be dangerous for mariners if not avoided. Some of these deposits have high archaeological potential. The rich marine life and biodiversity of the marine cultural topography is linked to the longterm cultural association of the coastal populations with the fishing industry.

Deposits can vary widely, particularly around the Harwich Haven area. In the approach channel geological sediments are locally covered by a thin veneer of fine sands and mud, with coarser sand near Shipwash Bank. To the north there is a patchy and thin covering of sand overlying a gravel or clay substrate. East of Shipwash Bank sediments are generally immobile coarse sand and gravel. To the South is predominantly mud and gravel, becoming sandy to the south east. Around the Naze sand gives way to clay bedrock.

The Outer Thames REC (Regional Environmental Characterisation) recently conducted a large survey of the southern part of the area. The East Coast REC to the north is still ongoing. The REC divided the south of the area into three main zones based on marine features; the western zone is dominated by a large coast-parallel sandbank system made up of well-sorted sand with sandy gravels in the troughs between. The central zone comprises a bedrock platform overlain by a thin gravelly lag deposit, dispersed sandy bedforms and isolated sandbanks and the eastern zone is made up of extensive sand dunes (Sturt and Dix 2009, ix).

In the south the London Clay formation is at or close to the seabed across much of the area. This includes basal elements comprising erosion resistant bedrock formed by cemented beds of volcanic ash. These give rise to a number of named features on the seabed including Naze ledge, Kettle Bottom and West Rocks (D'Ollier 2002, 19).

One of the most unusual features on the seabed in this region is the outcrop of bedrock (Pleistocene Coralline Crag) off the Thorpeness headland. This type of feature is unusual off this area of coast and attracts local sealife. The area is also a potential recreational dive site (Oxford Archaeology 2007).

## **HISTORICAL PROCESSES; COMPONENTS, FEATURES AND VARIABILITY**

The marine cultural topography of the region is largely a product of natural processes throughout history. The seabed has been (and is) shaped by the interaction of underlying geology and marine erosional and depositional processes. However, the survival of these features is dependent on both natural and human processes. For example, the increased human activity since the Second World War, in terms of aggregate extraction and offshore developments such as hydrocarbon extraction, and increasingly the development of offshore wind farms is having significant impact on the seabed.

The majority of bedforms are transverse to the dominant north-east to south-west tidal flow (Sturt and Dix 2009, 12). A series of ten enclosed deeps have been interpreted as being formed at the margin of the Elsterian-Anglian glacial maximum ice limit (ibid), through drainage or discharge of glacial meltwater (ibid, 35). These are distributed within the central and eastern zones of the Outer Thames REC (see above) and are orientated NNE-WSW (ibid, fig. 3.11). The stratigraphic relationship of these features with the Thames-Medway palaeochannel located in the south of the area, suggests that this feature was formed before the Elsterian-Anglian glaciation, possibly as early as Cromerian Complex II (OIS 18: c. 720,000 BP), when correlated with terrestrial river gravels on the Essex coast (ibid, ix). During the last marine transgression tidal flat deposits, known as Elbow Formation were laid down at the sea edge and eroded again as sea levels continued to rise (D'Olier 2002, 19).

There is a growing body of evidence for submerged palaeolandscapes accrued through marine industrial processes such as aggregate dredging and commercial trawling. Research in dredging area 240, for example, was catalysed by the 2008 discovery of 75 Palaeolithic artefacts including hand axes, flakes and cores and bones including woolly mammoth, bison and reindeer in stockpiles of gravel in Belgium. These were traced back to their origin, some 10 km off the coast of Great Yarmouth (Wessex Archaeology 2009). Mesolithic artefacts have also been dredged up offshore, including numerous artefacts from Brown Bank and Dogger Bank (see Palaeolandscape component). Subsequent to the Mesolithic/Neolithic transition (i.e. from c. 6000BP) the area was inundated and therefore unoccupied.

The sandbanks discussed above are not fixed features and are subject to sometimes very large changes depending on coastal dynamics. For example, in 1868 Dunwich and Sizewell Banks were clearly distinct from one another. By 1949 they had merged, although the 20<sup>th</sup> century saw much further erosion and movement inshore. Currently the southern series of sandbanks measure 1-5 km across and 10-30 km long with crests commonly drying at low water (REC 8). The channels in between are 2-5 km across and typically 20 m deep (ibid).

## **VALUES AND PERCEPTIONS**

The biodiversity of the marine cultural topography, especially where it relates to fish stocks forms a component of the highly valued fishing heritage of the region. The high diversity of substrates, including fine and coarse sands and variation in degree of exposure has created a higher degree of biodiversity around the Wash. The Marine cultural topography also has high archaeological potential, and can contribute to our understanding of past landscape use.

Marine features are not likely to feature in the general psyche, however they are extremely important to sea users, particularly with regards to sandbanks which can be fatal if not avoided. The parallel sandbanks are a significant feature in this area.

### **RESEARCH, AMENITY AND EDUCATION**

The research, amenity and educative value of the resource includes academic research, as well as public education and enjoyment. Research potential includes areas of maritime archaeological potential, defined as areas where high potential for shipwreck losses coincide with areas of high preservation potential. Palaeo-valleys (the Thames-Medway) are also areas of high research potential, including the reconstruction of submerged and buried landscapes, integrating geophysical, geomorphological and sedimentological investigation of offshore river systems and allowing areas of archaeological potential to be better understood. This contributes to the emerging field of submerged prehistoric archaeology.

The outcrop of Coralline Crag off Thorpeness provides a unique research opportunity in terms of its ecological and geological value, attracting species not usually found in this area.

Amenity and educative value could include geological and oceanographic perspectives, as well as the study of how marine industries such as aggregate extraction interact with the natural environment.

### **CONDITION AND FORCES FOR CHANGE**

The major forces for change of this character type tend to be 'natural' processes such as sediment deposition and current. The activities of animal species such as fish and birds may also affect the environment to a certain extent. It is also likely that these processes, particularly rising sea levels and climate change are partly created by humans. Many of the geological features are constantly shifting such as the series of shingle bars at the mouth of the Deben, known as 'the knolls'.

Geological features are also added to and under pressure from offshore development activities. Conditions and forces for change also include industrial processes: trawling (commercial fishing), dredging for aggregates, the hydrocarbon industry, along with the transport of raw materials and consumer goods. The dredging of channels for large ships and military activities are also important.

### **RARITY AND VULNERABILITY**

The marine cultural topography is under pressure natural and culturally induced processes such as erosion, sea-level rise and global warming. Ecosystems are under pressure from human activities such as trawling and offshore developments (wind farms, aggregate extraction). These activities as well as the movement of water and sediments could damage the prehistoric and historic features.

Natural bedrock or hard substrata of any type are unusual on this coast (Moore and Bamber 1995). Therefore features such as the outcrop of Crag at Thorpeness are rare in this area.

### **PUBLISHED SOURCES**

British Geological Survey 1989 *Thames Estuary Sheet 51° N-00°*.  
British Geological Survey 1:250 000 Series Solid Geology

D'Olier, Wallingford, B. H. R., 2002, *Southern North Sea Sediment Transport Study, Phase 2 (appendix 10)*. Technical Report. CEFAS/UEA

Moore, J. & Bamber, R., 1995, Diving Survey of an Unusual Rocky Habitat off Thorpeness Point, Sizewell, Suffolk. *Porcupine Newsletter*, 5 (10): 239-245

Sturt, F. and Dix, J. K. EMU Ltd. 2009. *The Outer Thames Estuary Regional Environmental Characterisation*. London, United Kingdom, ALSF/MEPF (DEFRA)

Wessex Archaeology, 2009, Area 240 exhibition. Available at [http://www.wessexarch.co.uk/projects/marine/alsf/seabed\\_prehistory/area-240/exhibition](http://www.wessexarch.co.uk/projects/marine/alsf/seabed_prehistory/area-240/exhibition)

### **Websites**

Oxford Archaeology, 2007 England's historic seascapes: Southwold to Clacton  
[http://ads.ahds.ac.uk/catalogue/archive/ehsclacton\\_eh\\_2007/aldeburgh.cfm?CFID=573996&CFTOKEN=39545028](http://ads.ahds.ac.uk/catalogue/archive/ehsclacton_eh_2007/aldeburgh.cfm?CFID=573996&CFTOKEN=39545028)