

**Broad Character: Cultural Topography**

**Character Type: Cultural Topography (marine)**

**National Perspective**

**INTRODUCTION: DEFINING/DISTINGUISHING ATTRIBUTES**

The Character Type includes the following Sub-types:

- Coarse sediment plains
- Fine sediment plains
- Mud plains
- Mixed sediment plains
- Sand banks with sand waves
- Exposed Bedrock

This Character Type refers to those aspects of cultural topography whose physical expressions are predominantly seaward of Mean Low Water.

Coarse sediment plains are extensive areas of seafloor whose surface sediments predominantly comprise different grades of pebbles, rocks, boulders etc with lower sand and very low silt and clay contents. Of cultural relevance is their role as a spawning ground and habitat for particular commercially-exploited fish species and hence their correlation with particular fisheries and their management considerations by government, conservation bodies and fishing communities. Bottom trawling methods also have significant impacts on marine habitats and biodiversity in this Sub-character Type. Coarse sediment plains also provide distinct preservation conditions for their share of the occasional seafloor wrecks present across all the seas. Their relationship to marine topography has implications for the potential form and survival of underlying palaeolandscape components. They will also incorporate some of the 'background noise' of pollution, especially by littered debris, which now affects all marine areas from sea surface to sea floor.

Fine sediment plains refer to large areas of seafloor whose surface sediments predominantly comprise different grades of sand and very low silt and clay content. Of cultural relevance is their role as a spawning ground and habitat for particular commercially-exploited fish species including flatfish and hence their correlation with particular fisheries and their management considerations by government, conservation bodies and fishing communities. Bottom trawling methods also have significant impacts on marine habitats and biodiversity in this Sub-character Type. Fine sediment plains also provide distinct preservation conditions for the occasional seafloor wrecks present across all the seas. Their relationship to marine topography has implications for the potential form and survival of underlying palaeolandscape components. They too will also incorporate some of the 'background noise' of pollution which now affects all marine areas and tiers.

Mud plains refer to extensive areas of seafloor whose surface sediments predominantly comprise fine sediment grades with high silt and clay contents. Occurring mainly in sheltered seas around England, they have cultural relevance as the chief habitat for a range of commercially-exploited shellfish species, including *nephrops spp.* (Langoustines/Dublin Bay prawn), and hence their correlation with particular fisheries and their management considerations by government, conservation bodies and fishing communities. Trawling methods also have significant impacts on marine habitats and biodiversity in this Sub-character Type. Mud plains provide distinct preservation conditions for the occasional seafloor wrecks present across all the seas. Their relationship to marine topography has implications for the potential form and survival of underlying palaeolandscape components. They will also incorporate their share of the 'background noise' of pollution.

Mixed sediment plains are extensive areas of seafloor whose surface sediments predominantly comprise heterogeneous sediment grades, from pebbles and gravels to sands, silts and clays. The overall composition can be highly variable, as can the form of their grades' mixing. In addition to well-mixed sediments, they may include component mosaics and/or layering. Their highly variable composition and form distinguishes this Sub-character Type from the coarse and fine sediment plains and their more definable cultural implications for fish habitat, shipwreck preservation and palaeolandscape form, however bottom trawling methods still have significant impacts on marine habitats and biodiversity in this Sub-character Type. These areas also incorporate their share of the 'background noise' of pollution.

Sand banks with sand waves refer to an area of sand banks containing extensive wavelike structures and megaripples formed by rapidly moving currents of water on the sandbanks' surface. These may occur around the margins of sandflats and be barely submerged at various states of the tide or they may occur in deeper water. They can pose hazards to shipping and many in shallower waters appear on charts. They form a spawning ground and habitat for various commercially-exploited fish species including flatfish and shellfish, hence their correlation with particular fisheries and fishery management considerations by government, conservation bodies and fishing communities. Shellfish harvesting, dredging and bottom trawling methods have significant impacts on marine habitats and biodiversity in this Sub-character Type. Sand banks with sand waves also provide distinct preservation conditions for wrecks present within them. Their relationship to marine topography has implications for the potential form and survival of underlying palaeolandscape components. They will also incorporate their areas' share of the 'background noise' of pollution.

Exposed bedrock refers to areas of the seafloor whose surface predominantly comprises bedrock exposures along with associated rocks and boulders but little finer sediment deposition. Variation in depth and surface irregularity of the bedrock exposures will correspond with the dangers they pose to shipping. Bedrock exposures are liable to snag fishing gear and may figure as 'rough' or 'catchy' areas in fishing ground perceptions. Their potential hazard to shipping may increase wreck debris to be found in this Sub-character Type, while it will also contain its share of the 'background noise' of pollution.

This Character Type varies considerably in the UK Continental Shelf, its variability being linked to the survival of prehistoric and historic features within it. Understanding this Character Type will enable an assessment of its archaeological as well as its historic character. For example Lizard Point (Southern England) is a headland highly exposed to sea conditions. It is characterised by a rocky foreshore with a rapidly dropping bathymetry, creating overfalls off the tip of the Lizard. Hence, Lizard Point is considered as having a high potential for ship losses based on the combination of rocky foreshore, potentially dangerous sea conditions, and overfalls. The seabed around the headland is bedrock, producing a very low potential for preservation of archaeological material due to its rocky nature. This would encourage scattered preservation within gullies rather than the presence of large segments of wreck material (for further details see Merritt *et al* 2007). Another example is Hurst Spit, a gravel spit running into the Western Solent. The area is exposed to prevailing winds and the seabed is characterised by gravels. The archaeological potential for the western side of the spit is low due to a high density of gravel. However, the eastern side is characterised by fine grained estuarine silts running out from the Lymington River and is therefore characterised by a high potential for good archaeological preservation. The only stratified Mesolithic site in a submerged location in England (Bouldnor Cliff) has been discovered in this area (Momber 2004).

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

The cultural aspects of this Character Type are several. The effects of human activities on marine biodiversity have been present for millennia since man began serious exploitation of marine resources, but their scale and intensity increased enormously

during and since the later 19<sup>th</sup> century. So too has the character of their impact on sea floor deposits and wildlife as fishing methods have developed to feed the rapidly growing populations of England and its neighbours, with rapid inland transport and refrigeration allowing fish to move from being a coastally-consumed product to one serving the inland population too. The resulting intensification of marine fish resource exploitation has far outstripped the carrying capacity of many fish species whether sought or caught unintentionally as 'by-catch'.

Many offshore marine areas are also areas that were once dry land at times of low sea level during the glacial periods and within several millennia of them, when much water was locked up in the ice sheets. That now submerged land was then human habitat whose land forms, buried soils and direct material remains, in the form of flint or bone tools and prey species' bones, are increasingly being recognised and researched from present activities affecting this Character Type.

Later activity above, on and in the sea has also produced a scatter of wreck and air-crash debris, along with considerable quantities of litter, affecting all expressions of this Type, however 'natural' they may otherwise appear.

Prehistoric and historic deposits exist widely across the UK Continental Shelf. Understanding the characteristics of the geological deposits (age and origin) including the geological processes that have formed the sediment deposits can provide insights into the potential type and location of its associated cultural features. Understanding the geological characteristics of the deposit therefore provides the essential foundation for the evaluation of archaeological or palaeoenvironmental potential. Depending on the mode and age of formation, for example, sand and gravel deposits may seal, contain and/or underlie single or multiple-episode archaeological deposits. Soft aggregates are mostly derived from the Middle and Late Pleistocene, which is contemporary with the first human colonisation and subsequent occupation of England and North-west Europe until the end of Last Ice Age (i.e. Palaeolithic period) (see Wenban-Smith 2002). Pleistocene fluvial, glacial and periglacial and beach gravels form much of the Palaeolithic archaeological record. Furthermore, Late Devensian and Holocene gravels provide much of the buried archaeology of valley landscapes (Brown 2004). Processes such as climate change and the fluctuation of sea levels over the last 2 million years contributed to the deposition of sand and gravels which now lie on the seabed (Gubbay 2005). These materials were originally deposited by rivers systems that are now submerged (BMAPA 2000; ODPM 2005). These processes have periodically exposed seabed as dry land, thereby creating a space for human occupation and the potential for associated archaeological deposits. The archaeological potential of these marine deposits is immense, and there is still a need to enhance our understanding of these drowned landscapes and palaeoenvironments which are still relatively poorly understood.

Areas of mud and silt deposits can generally be found within estuarine contexts such as the entrances to Foulness in the Crouch Estuary and around the entrance to the Swale, stretching out towards Margate. Another case is the Wash estuary, which has a predominantly sandy seabed, with fine grained silts and mud along the foreshore surrounding the river entrances. The approaches are characterised primarily by a gravel seabed although the areas where the banks have formed tend to be sand or gravelly sand. The preservation of archaeological remains in these contexts could be considered as high although in gravelly contexts remains could be scattered and/or broken. Conversely, the seabed on the approaches to the Severn Estuary, although wide and exposed, is characterised by solid bedrock deposits which are not conducive to burial and *in situ* preservation.

#### **VALUES AND PERCEPTIONS**

This Character Type is highly valued ecologically due to its biodiversity. For example, the Wash (Norfolk/Lincolnshire), on the east coast of England, consists of extensive fine sands and drying banks of coarse sand. This diversity of substrates, together with a variety in degree of exposure, means that there is a high diversity relative to other east coast sites (<http://www.jncc.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=h1140>).

Lately, this Character Type has received increasing attention from archaeologists recognising the archaeological potential that it could represent and therefore its contribution to the understanding of past communities' dynamic and varied use of the landscape they inhabited.

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

The English Heritage-Aggregates Levy Sustainability Fund (ALSF) *Enhancing Our Understanding: Navigational Hazards* project used the UK's extensive hydrographic archives, including charts, sailing directions and pilotage notes, and modern seabed geology mapping to identify and map 'Areas of Maritime Archaeological Potential' (AMAP): areas where high potential for shipwreck losses coincide with areas of high preservation potential (Merritt *et al* 2007). This project provided the foundations for the development of a quantitative system for assessing the archaeological potential for shipwreck material in the marine environment according to different sediment types. Application to shipwrecks as well as other archaeological deposits such as submerged prehistoric landscapes would enable a deeper understanding of the archaeological potential of the marine environment.

The Submerged Palaeo-Arun River Project funded through English Heritage-ALSF has reconstructed the palaeo-morphology of submerged and buried landscapes of palaeo-Arun valley on the northern English Channel, integrating geophysical, geomorphological and sedimentological investigation of offshore river systems (Gupta *et al* 2004). This research facilitated the development of models which allow complex submerged landforms and buried subsurface variations that have extensive archaeological potential to be better understood. The new data provided by this study has contributed to the emerging field of submerged prehistoric archaeology, as well as developing procedures to assess the potential of the archaeological resource in offshore areas.

Collaborative projects between industry and the heritage sector through the analysis of further geophysical data and sediment characteristics and dynamics will contribute to clarify issues regarding archaeological potential and its preservation in the marine environment.

The amenity value of this Character Type could be further explored through, for example, interactive CDs and web resources. This Character Type also offers potential for educational initiatives to raise public awareness about the connection between both the natural and historic environment within a marine context.

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

The historic cultural character of this Character Type is both added to and under pressure from offshore development activities. Depending on the industrial activities, geophysical surveys (and in some cases core sampling and diver inspections) are a requirement for offshore developments (e.g. wind farms and aggregates extraction, amongst others). These surveys can potentially increase the knowledge about the historic environment of a regional and local area. Furthermore they could enable the

construction of detailed palaeoenvironmental and palaeogeographic reconstructions. Models (on local and regional scales) could then be developed for the location of particular types of site, for example. In an ideal world, this information will then feed into the local and national monuments records and inform future curatorial decisions. This will provide the opportunity for beneficial cumulative knowledge regarding the marine zone.

English Heritage-ALSF funding, with cooperation from the British Marine Aggregate Producers Association (BMAPA) has produced *Protocol for Reporting Finds of Archaeological Interest* from aggregates extraction activities by BMAPA companies: the protocol has produced a large number of valuable and varied finds reports since its inception in August 2005 ([http://www.wessexarch.co.uk/files/projects/BMAPA-Protocol/protocol\\_text.pdf](http://www.wessexarch.co.uk/files/projects/BMAPA-Protocol/protocol_text.pdf) ).

### RARITY AND VULNERABILITY

Some prehistoric and historic features within this Character Type could be considered rare where time-depth is visible (e.g. Bouldnor Cliff submerged landscape, off the Isle of Wight).

This Character Type is under pressure from both natural and culturally induced processes such as erosion, sea level rise and global warming. The ecosystems within this Character Type are also under pressure from human activities such as intrusive fishing activities (e.g. trawling) and offshore developments (e.g. wind farms, and aggregate extraction amongst others). The effects of these activities as well as the movement of water and sediments could damage the prehistoric and historic features present and largely yet to be revealed within this Character Type.

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### WEBSITES

*National Perspective/Cultural Topography/ Cultural Topography (marine)*

<http://www.jncc.gov.uk/>