Report No: 2014R043

Rapid Coastal Zone Assessment Survey Phase One Desk-based Assessment for South-West England (South Coast Dorset) 6673

Cornwall Archaeological Unit

Bournemouth University

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Client	**English Heritage**
Report Number	**2014R043**
Date	**February 2015**
Status	**Final v.1**
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Acknowledgements

This study was commissioned by National Heritage Protection Commissions, English Heritage, and carried out by the Cornwall Archaeological Unit (formerly Historic Environment Projects, Cornwall Council) and Bournemouth University. The English Heritage lead was initially Peter Murphy and subsequently Marcus Jecock, the Project Assurance Officers were Dave Hooley and subsequently Helen Keeley.

We would particularly like to thank Claire Pinder, Senior Archaeologist for the Dorset County Council's Environment Directorate, for all her help during the project. Help with material for this report was also provided by: Ciorstaidh Hayward Trevarthen, Finds Liaison Officer for the PAS, Gordon Le Pard, Nancy Grace, Martin Papworth, Tony Flux and Phil Dyke of the National Trust; Richard Edmonds, DCC Geologist and Timothy Darvill, Bournemouth University. The palaeogeographic models of the Dorset coast were kindly produced by Fraser Sturt (University of Southampton).

The CAU Manager was Charles Johns and the BU project manager Dave Parham; Pete Dudley (CAU) produced the GIS methodology, Krystyna Truscoe (CAU) provided technical support and data entry training, Graeme Kirkham (CAU) and Tom Cousins (BU) carried out the archive searches.

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Cover illustration

View across Peverill Point to Old Harry Rocks (photo: Ben Williamson).

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Abbreviations

AMIE Archives, Monuments, Information, England (computer system holding the NRHE)

ATL Advance the line

BBI Black-Burnished pottery

BGS British Geological Society

BP Before Present

BU Bournemouth University

CAU Cornwall Archaeological unit

CC Cornwall Council

DBA	Desk-Based Assessment
Defra	Department for the Environment, Food and Rural Affairs
DoB	Defence of Britain Project
DSM	Digital Surface Model
DTM	Digital Terrain Model
EH	English Heritage
EIA	Environmental Impact Assessment
EUS	Extensive Urban Survey
GCR	Geological Conservation Review
GIA	Glacial Isostatic Adjustment
GIS	Geographical Information System
HBSMR	Historic Buildings, Sites and Monuments Register
HER	Dorset Historic Environment Record
HLC	Historic Landscape Characterisation
HLF	Heritage Lottery Fund
HSC	Historic Seascape Characterisation
HTL	Hold the line
ICZM	Integrated Coastal Zone Management
LAT	Lowest Astronomical Tide
LB	Listed Building
LCA	Landscape Character Assessment
MA	Maritime Archaeology Limited
MCZ	Marine Conservation Zone
MHW	Mean High Water
MLW	Mean Low Water
MOLA	Museum of London Archaeology
MR	Managed realignment
MTL	Mean tide level
NAI	No active intervention
NCA	National Character Area, formerly Countryside Character Area (CCA)
NGR	National Grid Reference
NHLE	National Heritage List Entry
NHPP	National Heritage Protection Plan
NMP	National Mapping Programme
NPPF	National Planning Policy Framework
NRHE	National Record of the Historic Environment
OASIS	Online access to the index of archaeological investigations
OD	Ordnance Datum – height above mean sea level at Newlyn

OIS	Oxygen Isotope Stage
OS	Ordnance Survey
PAS	Portable Antiquities Scheme
PDZ	Policy Development Zone (Poole and Christchurch Bay SMP2)
PSA	Policy Scenario Area (Durlston Head to Rame Head SMP2)
RCHME	Royal Commission on Historical Monument (England)
RCZAS	Rapid Coastal Zone Assessment Survey
RoW	Receiver of Wreck
RSL	relative sea-level
SCA	Seascape Character Assessment
SDADCAG	South Devon and Dorset Coastal Advisory Group
SM	Scheduled Monument
SMP	Shoreline Management Plan
SMR	Sites and Monuments Record
SWARF	South West Archaeological Research Framework
UKHO	United Kingdom Hydrographic Office
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WDDC	West Dorset District Council
WHS	World Heritage Site
WPM	With Present Management
WWI	World War One
WWII	World War Two

Summary

The national programme of Rapid Coastal Zone Assessment Surveys (RCZAS), funded by English Heritage, is designed to enhance and update coastal Historic Environment Records (HERs) through a two-phased approach. Phase 1 (Desk-based Assessment) assesses the data available on the character of the historic environment within the project area, and potential threats to heritage assets, in order to design a strategy for Phase 2 (Field Survey) which prioritises areas where heritage assets may be most at risk.

This report describes the results of the Phase 1 component of the RCZAS for Dorset carried out in 2014 by the Cornwall Archaeological Unit and Bournemouth University. The aims of the project were to:

- enhance the Dorset HER and the National Record of the Historic Environment;
- inform future coastal and shoreline management;
- provide an overview of coastal change from the Palaeolithic onwards;
- assess the degree and nature of threat to coastal historic assets;
- provide a broad assessment of the likely archaeological potential and vulnerability of the resource;
- identify future research priorities; and
- enhance public understanding and enjoyment of the coastal heritage.

The study area extended from the Dorset/Hampshire county border to the Dorset / Devon county border, that is to say, from just to the east of Highcliffe near Christchurch to Devonshire Head at the west end of Monmouth Beach to the west of Lyme Regis. It included an assessment of surviving remains along the open coast and its tidal estuaries, including the intertidal zone out to Lowest Astronomical Tide with a 1km 'hinterland' to the landward side of Mean High Water and extending up estuaries to 1km beyond the tidal extent. The study area was sub-divided according to the Policy Development Zones (PDZs) and Policy Scenario Areas (PSAs) set out in Shoreline Management Plans for Durlston Head to Rame Head and Hurst Spit to Durlston Head (Poole and Christchurch Bays — the 'Two Bays').

The Dorset coast is composed predominantly of sea cliffs, punctuated by estuaries, rias, cobble beaches, isolated stacks, raised beaches and lagoons. This coastline is internationally renowned for the rock strata exposed along the cliffs and coastal landforms such as Lulworth Cove, Durdle Door and Chesil Beach which form part of 'The Jurassic Coast', England's first natural World Heritage Site.

The current desk-based project has created more than 980 new sites for the HER and updated another 143 records for sites already recorded in the HER. The new sites include four possible Early Bronze Age barrows, an Iron Age storage pit, a Late Iron Age or Roman midden, a possible medieval rabbit warren, medieval or post-medieval strip lynchets, a mill and a coastal battery, in addition to 656 new post-medieval sites and 307 new modern sites.

Threats to the coastal historic environment resource can be characterised in two ways: 'natural' threats such as coastal change and rising sea-levels and 'anthropogenic' threats including coastal defence schemes, infrastructure works and visitor pressure.

Research priorities and themes identified by the desk-based assessment are presented in the context of the regional themes and research aims set out in the South West Archaeological Research Framework (SWARF).

Specific sites and areas which would benefit from further research or work include:

- Scheduled Monuments and Registered Parks and Gardens threatened by coastal erosion;

- new sites identified by the RCZAS;
- rapid identification surveys across targeted areas of low HER record density;
- sea-level rise in Poole Harbour;
- peat deposits in Poole Harbour and along the Dorset coast;
- the Green Island complex;
- later prehistoric, Roman and early medieval settlement and industry in the wider coastal zone;
- coastal field systems and medieval settlements;
- historic use of coastal promontories;
- nineteenth- and twentieth-century coastal development;
- military facilities on the Isle of Portland;
- WWII defences at Studland Bay and Abbotsbury and elsewhere along the coast;
- maritime findspots;
- hulks in Holes Bay, Poole Harbour; and
- assessment of wrecks which are over 100 years old and therefore defined as Underwater Cultural Heritage under the UNESCO 'Convention on the Protection of the Underwater Cultural Heritage' (2001). There are 12 such known wrecks within the study area.

1 Introduction

1.1 Project background

England's coastal zone contains a legacy of historic assets including a complex array of fragile and irreplaceable archaeological remains, historic buildings and structures, and entire landscapes. These remains are vulnerable to a wide range of threats, including anthropogenic pressures, such as those associated with commercial development and shoreline management, as well as natural processes of coastal change. It is now generally accepted that coastal physical processes are being forced by changes in annual rainfall distribution and wave direction, relative sea-level rise and an increase in storm incidence, all associated with wider climate change (English Heritage 2012a).

Over recent decades it has been recognised by coastal managers and the Government that the entire English coastline cannot be maintained in its present form through the twenty-first century and that, where possible, natural processes should be allowed to operate. Coastal management is now viewed more holistically, taking into account not just the need to protect life and property but also environmental and social factors, as part of the move towards Integrated Coastal Zone Management (ICZM).

Defra's programme of shoreline and estuary management contributes to this development. A Shoreline Management Plan (SMP), for example, provides 'a large-scale assessment of the risks associated with coastal processes and presents a policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable manner' (Defra 2001; 2003; 2005; 2006).

The process of Shoreline and Estuary Management Plan development is consultative, drawing on information provided by, and balancing the needs of, sectoral interests. Effective participation by the heritage sector depends, first, on identifying coastal historic assets, evaluating their significance and potential, and assessing which may be at risk from coastal change. Data collection, interpretation and synthesis for the RCZAS is directed primarily towards these aims.

In 1997 English Heritage and the RCHME published a joint policy statement on the management of coastal archaeological remains (English Heritage and RCHME 1996) and a nationally-based assessment of English coastal archaeology (Fulford *et al* 1997). These documents were followed by more specific guidance (English Heritage 2003; 2006b). The assessment highlighted the poor quality of archaeological records relating to the coast and the policy statement recommended that: '*The record of coastal archaeology held nationally and locally should continue to be actively developed and enhanced in order to permit effective management of the resource and to facilitate understanding of England's development as a maritime nation*'.

Whilst the advantages of thematic surveys on the coast were acknowledged by the assessment, it was also noted that the quality of the available record of coastal remains was such that in many areas any such detailed studies would need to be preceded by rapid baseline surveys allowing a broad assessment of the range of historic assets available at the coast, their significance and their vulnerability.

One of the main recommendations was for a new comprehensive national coastal survey, which led to initiation of the English Heritage Rapid Coastal Zone Assessment Survey (RCZAS) programme in the late 1990s (Murphy 2014). In order to encourage a common approach to the surveys English Heritage provided 'A Brief for Rapid Coastal Zone Assessment Surveys' (1999) which envisaged each RCZAS comprising two phases, Survey Phase I Desk-based Assessment (DBA) and Survey Phase II Field Assessment. Completed RCZAS are listed in 'England's Coastal Heritage: A review of progress since 1997' (Murphy 2014).

This Phase 1 DBA RCZAS for Dorset was commissioned by English Heritage and carried out by the Cornwall Archaeological Unit (CAU — formerly Historic Environment Projects, Cornwall Council) and Bournemouth University (BU) in 2014. A previous Phase 1 DBA

RCZAS for Dorset had been carried out by Wessex Archaeology (2004 and 2004a), largely at the instigation of the Dorset Coast Forum, but this did not include a National Mapping Programme (NMP) component and so required updating to current standards by the present project.

1.2 Aims

The broad aims of the Phase 1 DBA component of the Dorset RCZAS were to:

- Provide an enhanced Historic Environment Record (HER) and National Record of the Historic Environment (NRHE) record for coastal heritage assets, to a nationally agreed common minimum data standard, in order to permit an improved curatorial response to strategic coastal planning or management initiatives at a national and regional level.
- Provide a factual basis for the initial curatorial response to individual applications for commercial developments or schemes, in advance of more detailed evaluation and mitigation related to Environmental Impact Assessments (EIAs) and/or planning applications.
- Provide data which is compatible with the needs of other coastal managers, parallel coastal surveys, industry and researchers.
- Provide an overview of coastal change from the Palaeolithic onwards.
- Provide an assessment of the degree and nature of threat to coastal historic assets which has regard to the models of future coastal change presented in relevant Shoreline Management Plans (SMPs).
- Provide a broad assessment of the likely archaeological potential and vulnerability of all stretches of the coast defined in the project scope.
- Provide a sound basis for developing management and research priorities in respect of sites and areas of potential with different levels of importance and under different levels of threat, based on:
    a. The identification of areas or sites meriting further survey or evaluation;
    b. The identification of areas or sites requiring positive management action;
    c. The identification of significant historic assets meriting consideration for protection by means of designation (Scheduled Monuments, Designated Wrecks, Listed Buildings, Conservation Areas, Registered Parks and Gardens, and Historic Battlefields, as defined in the National Heritage List for England);
    d. The identification of areas where heritage assets may be at high risk of damage or destruction; and
    e. The establishment of future research priorities for the coast.
- Enhance public understanding and enjoyment of the coastal heritage.
- Assist Local Authority curatorial archaeologists in development control.

1.3 Methods

The Phase 1 RCZAS DBA was carried out in three stages according to the methodology set out in the project design (Johns and Parham 2013) which was based on the project brief (English Heritage 2012a). Progress of the project was guided by the Project Liaison Group which convened in Dorchester three times during the course of the project.

1.3.1 Stage 1 Archive searches

The main sources consulted were as follows:

1. The Dorset HER, the NRHE and the National Trust HER, including designated assets and offshore records;
2. The SMPs for Durlston Head to Rame Head (Halcrow Group Limited 2011) and Poole and Christchurch Bays — the 'Two Bays' (Royal Haskoning 2011);
3. Available studies of palaeogeography and coastal change, historic map regression studies and specific studies of the coastal historic environment in the study area (see section 12.2);
4. Historic maps and charts held by the UK Hydrographic Office, the National and County Record Offices, and other regional collections; and digitised early OS editions;
5. Modern topography and bathymetry, derived from Ordnance Survey and UK Hydrographic Office data;
6. The Portable Antiquities Scheme (PAS) database;
7. Contact with local individuals, societies and organisations concerning both archaeological remains and access to difficult areas of the intertidal area;
8. Aerial photographic transcriptions generated by the Dorset RCZAS NMP component and the South Dorset Ridgeway NMP projects.

Additional sources were consulted including:

9. Client reports for developers not available in the SMR/HER;
10. Databases developed for thematic projects (e.g. The Defence of Britain; England's Shipping);
11. Museum archives;
12. Information on 'wreck' (recovered artefacts) declared to the Receiver of Wreck;
13. UK Hydrographic Office Wreck Data;
14. Local Authority Maritime Archaeological Databases.

All accessible historic maps and charts in the UK Hydrographic Office, Record Offices and relevant libraries were identified and listed in the project database. The level of analysis of historic map and chart data reflects the project aims.

1.3.2 Stage 2 Preparation and dissemination of the project report

The structure of this report is based on that of the Severn Estuary RCZAS Phase 1 report (Mullin *et al* 2009).

The project's Geographical Information System (GIS) provided a single platform to carry out the initial production of gazetteers for the report. The gazetteers included new sites recorded by the project and existing records that have been updated.

1.3.3 Stage 3: Project Design for Phase 2 Field Survey, HER enhancement

Stage 3 of the project will comprise preparation of a project design for the Phase 2 Field survey based on the results of the Phase 1 DBA.

The project's GIS database will be used to update and create records for the Stage 3 HBSMR update stage. This process will be carried out by remote access from CAU's Truro office onto the Dorset HBSMR via a dongle.

1.4 Structure of this report

This report comprises 13 sections and six appendices. Section 1 is an introduction to the project. Section 2 describes the study area, its geology, coastline and landscape character as well as relevant strategic historic environment projects. Section 3 sets out the historic environment and natural designations within the study area. Section 4 is an overview of coastal change from the Palaeolithic to the present day. Section 5 concerns coastal and marine management. Section 6 is a resumé of previous archaeological and historical work divided by relevant PDZ or PSA. Section 7 is an assessment of historic maps and charts and section 8 assesses other datasets such as the RCZAS NMP component, the Dorset HER, the NRHE, the wrecks, the Portable Antiquities Scheme, droits from the Receiver of Wreck, Lidar and boreholes. Section 9 is an assessment of areas of archaeological potential and vulnerability. Section 10 appraises threats to the coastal historic environment resource. Section 11 presents research priorities and themes and identifies specific sites and areas that would benefit from further research or fieldwork. Section 12 is list of references, primary and secondary sources and websites. Section 13 is an inventory the contents of the project archive. Appendix 1 sets out the GIS method. Appendix 2 is a list of UKHO charts, Appendix 3 is a list of Scheduled Monuments, Appendix 4 is a catalogue of Listed Buildings, Appendix 5 describes new sites identified by period and monument type and Appendix 6 is a list of sites which would be at risk due to a 'No Active Intervention' (NAI) policy in the Christchurch and Poole Bays SMP area.

2 Survey area

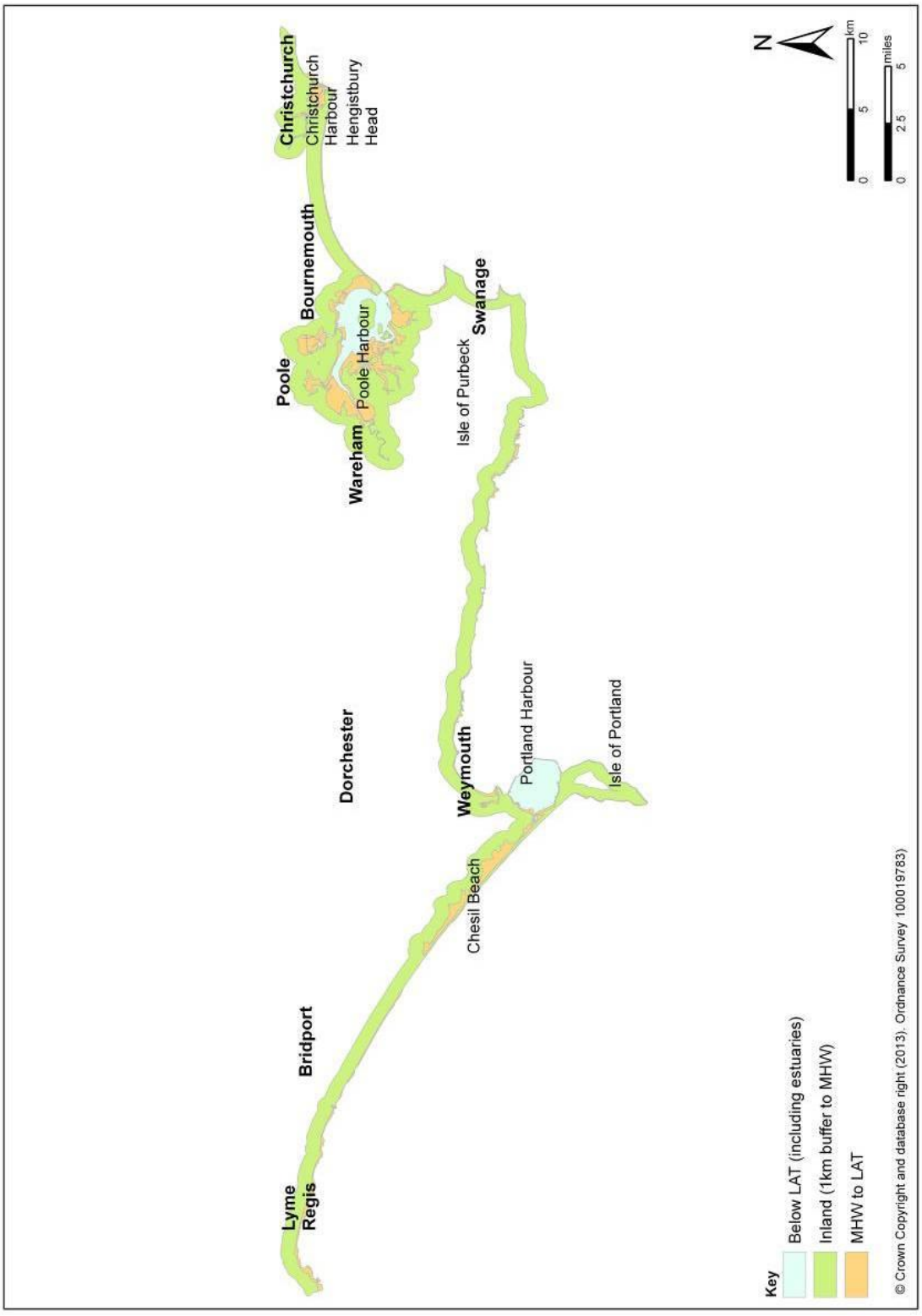


Fig 2.1 The Dorset RCZAS Phase 1 DBA study area.

2.1 The study area

The study area for the Phase 1 DBA RCZAS extended from the Dorset-Hampshire county border to the Dorset-Devon county border, that is to say, from just to the east of Highcliffe near Christchurch to Devonshire Head at the west end of Monmouth Beach to the west of Lyme Regis (Fig 2.1). The Isle of Wight was excluded from the RCZAS. The extent and scale of the project study area was discussed and agreed with Claire Pinder, Senior Archaeologist for the Dorset County Council's Environment Directorate at the project design stage. The study area comprised 184.89 sq km of inland area and 58.24 sq km of area between Mean High Water (MHW) and Lowest Astronomical Tide (LAT) (approximately 245 sq km in total). It included an assessment of surviving remains within both the open coast and its tidal estuaries, including the intertidal zone out to LAT from the coastal strand, and the immediate coastal hinterland. For Phase 1 DBAs the 'hinterland' is generally taken to be all 1km National Grid squares contiguous with, or overlapping, the coast and estuary shorelines to the landward side of MHW. In addition the study area extended up estuaries to 1km beyond the tidal extent.

Sediment cells for the study area are fully defined in the SMPs for Hurst Spit to Durlston Head (Poole and Christchurch Bays or 'Two Bays') (Royal Haskoning 2011) and Durlston Head to Rame Head (Halcrow Group 2011). The frontage for the Two Bays SMP is divided into four Policy Development Zones (PDZs), three are of which are relevant to this project: PDZ2 Christchurch Harbour and Central Poole Bay; PDZ3 Poole Harbour and Associated Coastline; and PDZ4 Swanage (Fig 2.2). The Durlston Head to Rame Head SMP2 is divided into 15 Policy Scenarios Areas (PSAs). Five of these are relevant to the Dorset RCZAS: PSA1 Durlston Head to White Nothe; PSA2 White Nothe to Redcliff Point; PSA3 Redcliff Point to Portland Bill; PSA4 Portland Bill to Thorncombe Beacon; and PSA4 Thorncombe Beacon to Beer Head (Figs 2.3 and 2.4).The Two Bays PDZs and the Durlston Head to Rame Head PSAs are used in this report as convenient divisions under which to discuss previous archaeological and historical research (section 6) and threats to coastal historic environment assets (section 10).

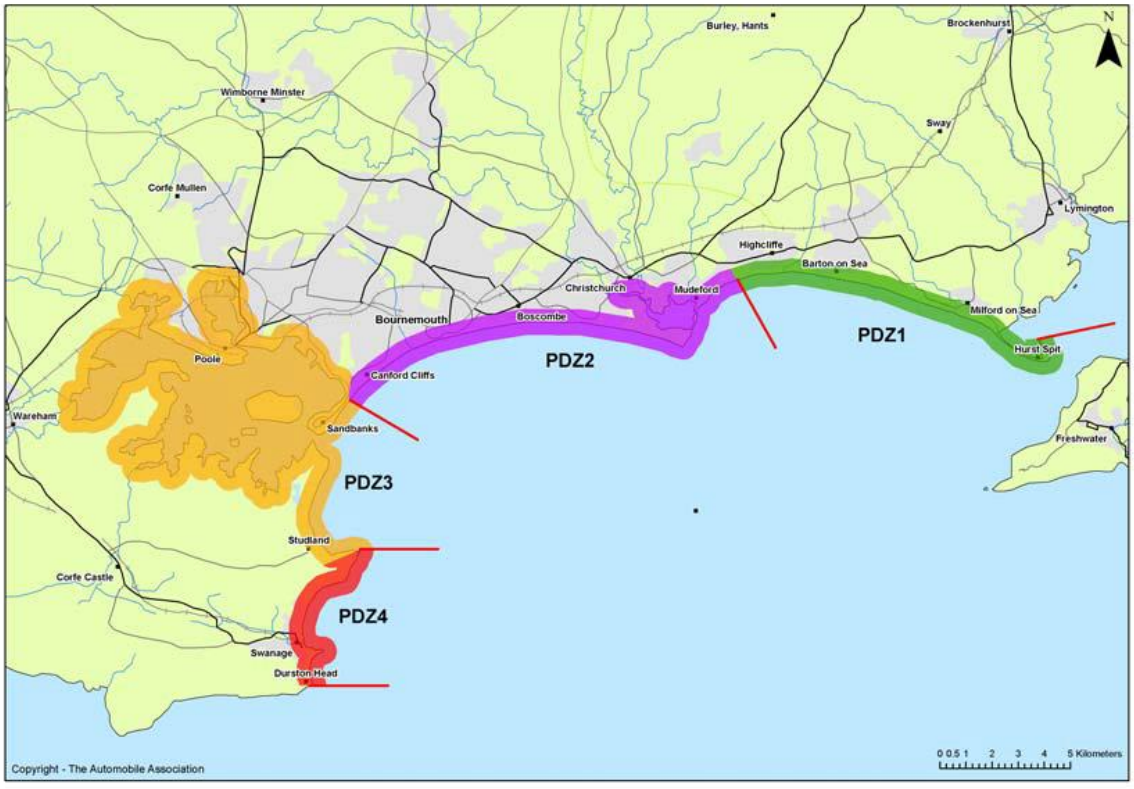


Fig 2.2 Policy Development Zones (PDZs) in the Poole and Christchurch Bays part of the study area (Royal Haskoning 2011).

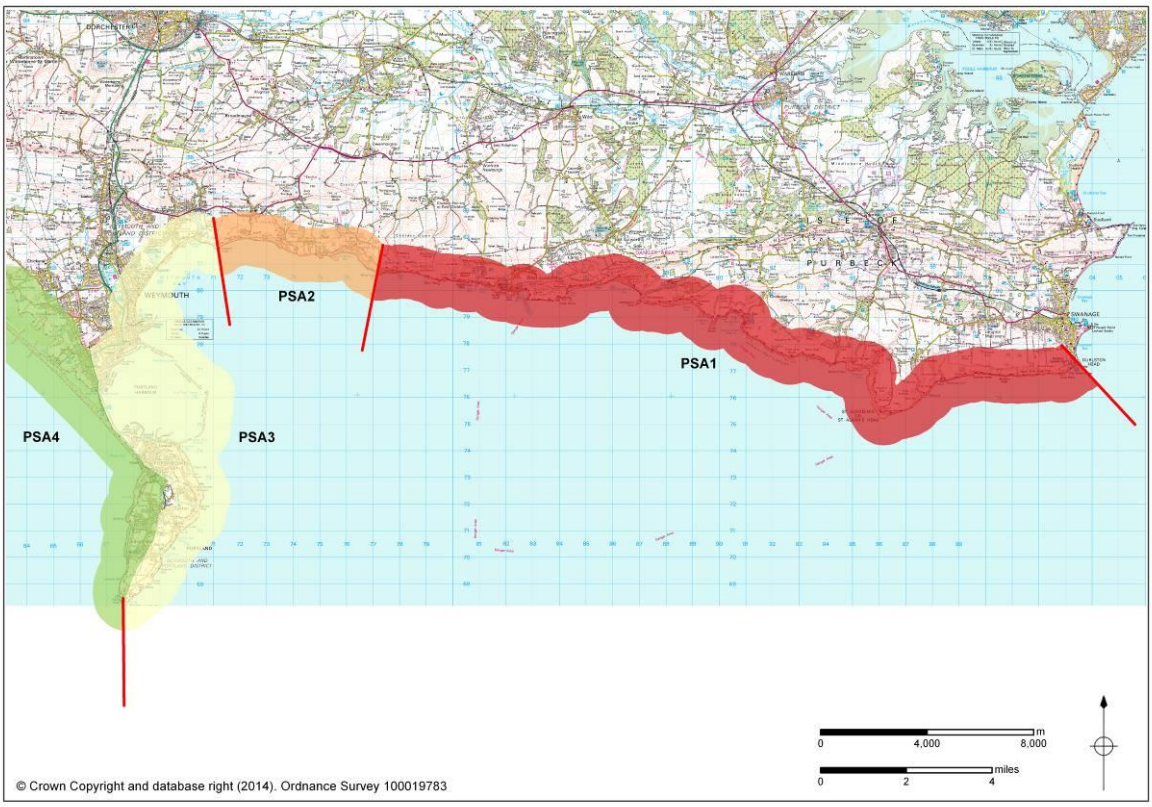


Fig 2.3a Policy Scenario Areas (PSAs) in the Durlston Head to Portland Bill sector of the study area (based on Halcrow Group 2011, fig 1a).

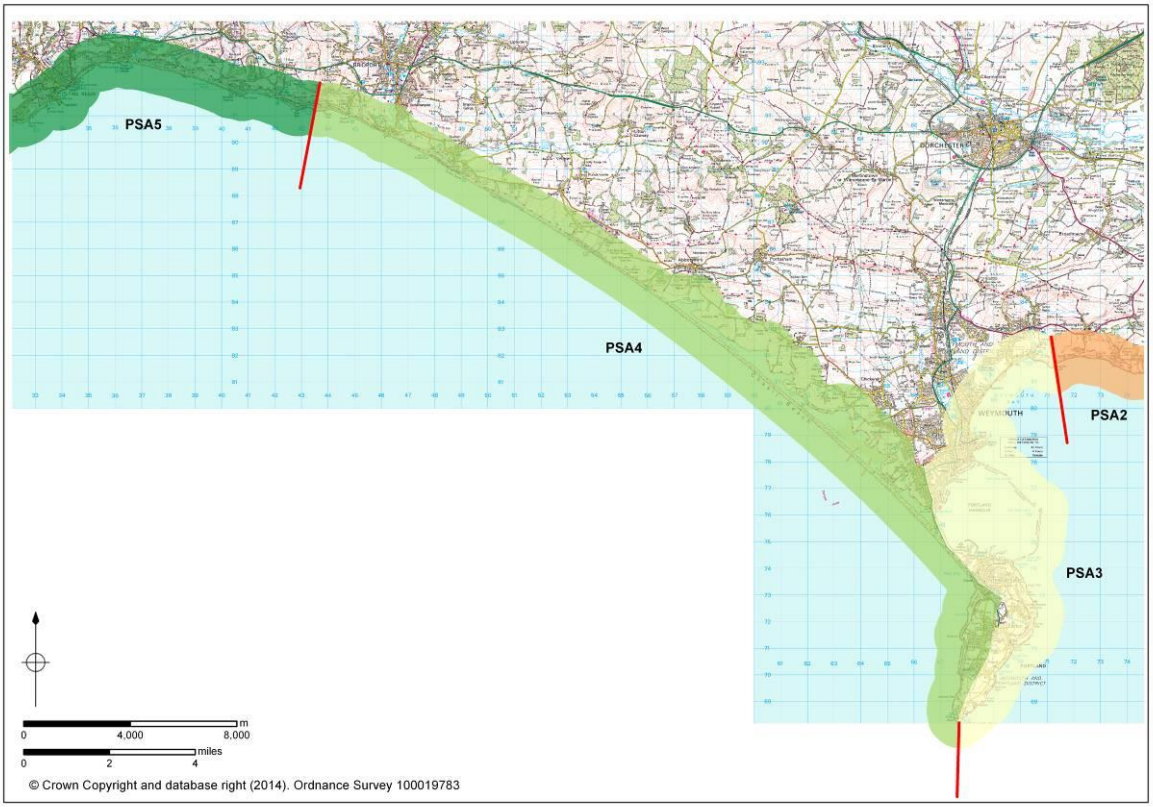


Fig 2.3b Policy Scenario Areas (PSAs) in the Portland Bill to Beer Head sector of the study area (based on Halcrow Group 2011, figs 1a and 1b).

2.2 Geology and coastline

The underlying geology of Dorset is very varied. Much of the county is made up of relatively recent sedimentary deposits with Cretaceous Upper Greensand and Gault Clays in the west around Charmouth and mixed sands and mudstones of the Eocene to the south-east. A number of limestone ridges run through Dorset, the most notable of which is a wide band of Cretaceous chalk which runs from the south-west to the north-east of the county underlying the Dorset Downs and forming part of the Southern England Chalk (Fig 2.4).

Part of the Dorset coastline was designated a World Heritage Site (WHS) in 2001 (below, section 3.1) and is one of the most visited and studied coastlines in the world. It comprises rocks from the Triassic, Jurassic and Cretaceous periods, documenting the entire Mesozoic era with well-preserved fossils. It includes Chesil Beach, one of only three major shingle structures in Britain.

During the Pleistocene, the end of the last glaciation and associated rising sea levels caused significant cliff and shoreline erosion within Christchurch and Poole Bays, which liberated very large amounts of sediment into the nearshore system. This, together with sediment released by tidal scour of the western approaches to the Solent, is thought to have been transported eastwards by littoral drift to form Hurst Spit (in a range of different forms before reaching its current form) (Royal Haskoning 2011, 3.1.1).

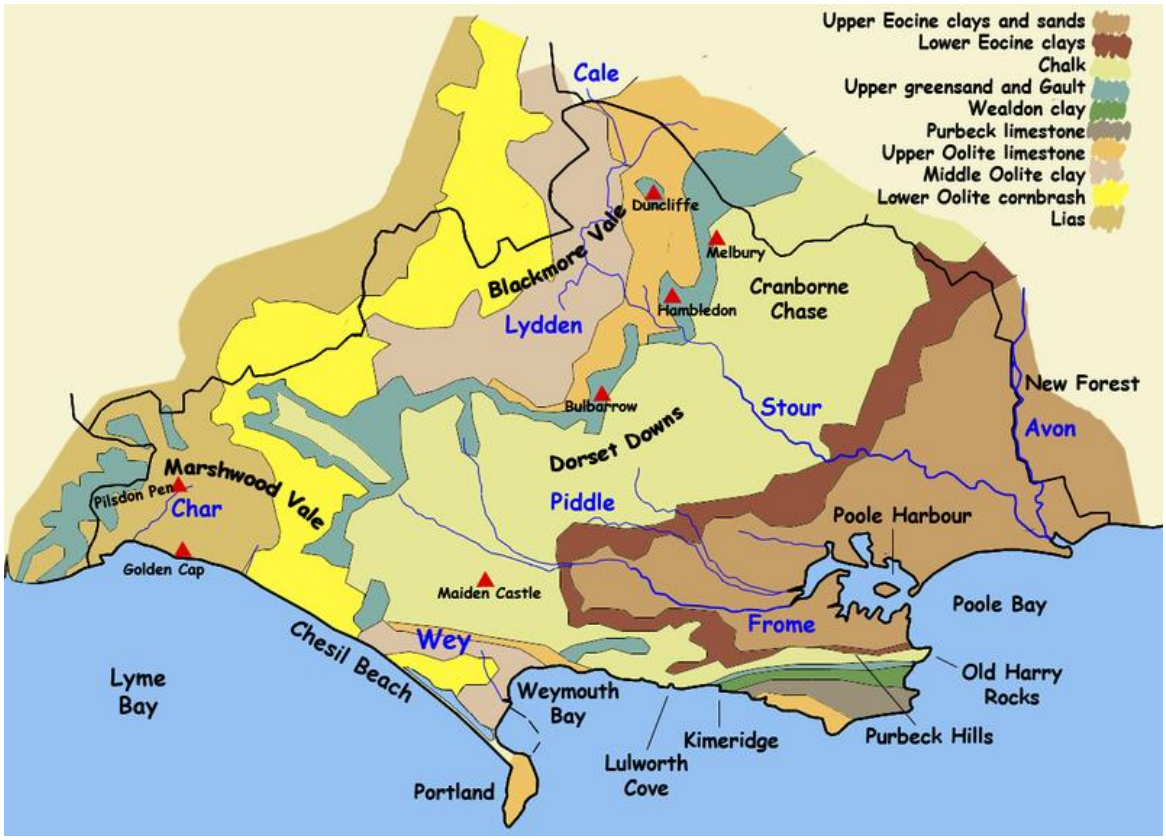


Fig 2.4 Simplified geology of Dorset (*Steinsky 2007) Reproduced under Creative Commons Attribution-Share Alike Unported licence http://en.wikipedia.org/wiki/File:Dorset_geology.png. Accessed online 18 November 2014).*

Over almost all of the study area, apart from Poole and Christchurch Bays, the seabed sediments comprise a discontinuous cover of coarse lag deposits less than 1m thick (the thickness of sediment increases in Poole Bay, deep fed by discharge from Poole Harbour). These sediments consist mainly of local rock and mineral detritus and lie either on solid strata or on older palaeo-valley infill sediments, while significant areas of

sediment-free rock coincide with outcrops of hard strata within the Jurassic and Lower Cretaceous (Wessex Archaeology 2004a, 5). Dorset's submarine geomorphology has most recently been reviewed by May (2013).

In basic terms, the open coast geology from Hurst Spit through to Studland (PDZ2 and PDZ3) is mostly formed of soft Tertiary sands and clays. Shingle deposits supported by clay form the eastern end of the frontage at Hurst Spit. The Tertiary deposits begin at Milford-on-Sea with cliffs reaching heights of 35m at Barton-on-Sea and 36m at Warren Hill (Hengistbury Head). Hengistbury Head exerts control on the plan forms of both Christchurch and Poole Bays, although it is a relatively soft geological feature. Its resistance to coastal erosion is attributed primarily to the presence of ironstone nodules. This soft geology has been a primary factor in the historic recession of the shoreline along this section of the coast (Royal Haskoning 2011, 3.1.1).

A significant local factor on the form of the coastline in the vicinity of Studland and Sandbanks is the presence of a 'training bank' at the entrance to Poole Harbour. This 'impacts on the natural behaviour of Shell Bay and pulls the alignment of the Studland shoreline more seaward of where it might more naturally lie. It is possible that without the training bank in position, there would be erosion of the northern part of Studland Heath and that both Hook Sands and the extent of the dunes would push further to the west' (Royal Haskoning 2011, 4.4.29).

Areas of productive agricultural land within Two Bays SMP2 area are mainly confined to river terrace deposits bordering the floodplains of the main rivers, which discharge into Christchurch and Poole Bay and surrounding heathlands (Royal Haskoning 2011, 3.1.1).

Fig 2.5 Swanage (Photograph: Ben Williamson).

From Studland through to Durlston Head (PDZ4), the geology becomes more resistant. Limestone and chalk cliffs dominate the coast. Handfast Point, Old Harry Rocks and Ballard Point are all composed of chalk. The backing cliffs of Swanage Bay itself are mostly softer Wealden beds of sands and clays (Fig 2.5). South of Swanage Bay the

geology of Durlston Bay and Durlston Head is composed mainly of Jurassic Limestones of the Portland and Purbeck beds. Durlston Bay itself has been created by the erosion of softer clays that emerge at the shoreline (Royal Haskoning 2011, 3.1.1).

The section of coastline from Durlston Head to White Nothe (PSA1) consists of high cliffs of outstanding landscape and geological value. Classic landforms along this coastline include Durdle Door and Lulworth Cove (Fig 2.5), formed from uplifting and tilting of Jurassic and Cretaceous rock sequences. Almost the entire coast lies within the Dorset and East Devon WHS for its geological importance, as well as the Isle of Portland to Studland Cliffs Special Area of Conservation (SAC) for its ecology. The frontage and its immediate hinterland are largely undeveloped, supporting agricultural land, Ministry of Defence (MoD) training areas and facilities. Much of the coast is currently undefended and erosion risks are generally low due to the resistant nature of the cliffs (Halcrow Group 2011, appendix D-2).

Fig 2.6 Arish Mell and East Lulworth (Photograph: Ben Williamson).

White Nothe to Redcliff Point (PSA2) is a mainly cliffed section of coast dominated by clay-rich cliffs of outstanding landscape, ecological and geological value, lying within the Dorset and East Devon WHS and Isle of Portland to Studland Cliffs SAC. This section of coastline experiences episodic landslide events that can cause tens of metres of retreat as a result of a single event. In places there is a risk of relict landslide complexes becoming reactivated. The coast here is currently mainly undefended, apart from a short stretch of defence in Ringstead Bay (Halcrow Group 2011, appendix D-2).

Fig 2.7 Chesil Beach and Portland Harbour (Photograph: Ben Williamson).

The section from Redcliff Point to Portland Bill on the Isle of Portland (PSA3) is one of the more heavily developed stretches of coastline within the western part of the study area, incorporating the key service and tourism centre of Weymouth (Fig 2.6) and the Isle of Portland. The Isle of Portland is an outcrop of limestone cliffs that forms the major promontory along the Dorset coast. These cliffs are fronted by rocky foreshores and raised beaches, which are often covered with debris from frequent cliff falls and from past quarrying operations (Halcrow Group 2011, appendix D-2).

The breakwaters of Portland Harbour represent major human intervention along the frontage. These provide protection to the Harbour and an element of sea defence, which appears to have led to reduced erosion of the cliffs on the north-west harbour shore. The western extent of Portland Harbour is bounded by Chesil Beach (Fig 2.7) and forms part of the landward side of the shingle ridge described below. The frontage comprises primarily open coast, with only one main river, the Wey, discharging into the sea at Weymouth. The coastal section lies within the Isle of Portland to Studland Cliffs SAC (Halcrow Group 2011, appendix D-2).

PSA4, from Portland Bill to Thorncombe Beacon, represents the eastern half of Lyme Bay, formed by the western side of the rocky headland of the Isle of Portland and Chesil Beach. This great pebble barrier bank is 29km (18miles) long, extending from Chiswell to West Bay, where Bridport Harbour's East Pier effectively forms its western boundary. Historical landward movement of the shingle bank has enclosed The Fleet between Portland Harbour and Abbotsbury, forming the largest tidal lagoon in Britain. Landward of the beach are the settlements of Chiswell, Abbotsbury, Burton Bradstock, West Bay, Bridport and Eype (Halcrow Group 2011, appendix D-2).

The outstanding geological features of the coastline have led to its inclusion within the Dorset and East Devon WHS. These include the cliff exposures of Portland and Purbeck Beds, the spectacular cliffs between West Bay and Burton Bradstock and Chesil Beach itself. The latter site is internationally designated for its wildlife value: Chesil Beach and The Fleet Special Protection Area (SPA), RAMSAR site and SAC. This stretch of coastline lies within the Portland and The Fleet Sensitive Marine Area designated for the importance of its marine wildlife, and also Sidmouth to West Bay SAC (Halcrow Group 2011, appendix D-2).

Land use along this stretch of coastline is predominantly agricultural and recreational but also includes industrial, extensive quarrying, urban and residential areas, whilst sea use comprises fishing, mussel beds, oyster beds and recreation. There is a harbour at West Bay (Fig 2.8) maintained by West Dorset District Council (Halcrow Group 2011, appendix D-2).

Fig 2.8 West Bay (Photograph: Graeme Kirkham).

The Lyme Bay frontage from Thorncombe Beacon to Beer Head to the west of Beer (PSA5) encompasses the settlements of Chideock, Seatown, Charmouth, Lyme Regis (Fig 2.8), Seaton and Beer. The coastline consists of undulating cliffs with shingle beaches. Some sections of the cliffs are subject to landslides, notably at Black Ven, Doghouse Hill and Golden Cap. Black Ven, between Charmouth and Lyme Regis, is considered to be the largest active coastal landslip and mudflow complex in Europe (Halcrow Group 2011, appendix D-3).

The Cobb, to the west of Lyme Regis, is a curved breakwater that shelters Lyme Regis Harbour. Major cliff stabilisation works have recently been completed at Lyme Regis (Halcrow Group 2011, appendix D-3).

The cliffs in this area are important for their coastal geomorphology and stratigraphy, for studying the interrelated process of cliff denudation and beach formation and of international importance for their fossil fauna. The coast lies within the Dorset and East Devon WHS Site as well as part of the Sidmouth to West Bay SAC. This stretch of coastline is also designated an Area of Outstanding Natural Beauty (AONB) and Heritage Coast (Halcrow Group 2011, appendix D-3).

Land use along this stretch of coastline is predominantly agricultural with urban areas at Lyme Regis, Seaton and Beer and other, smaller, settlements, whilst sea use comprises fishing and recreation. The area, particularly Lyme Regis, attracts a large number of visitors and consequently extensive recreational facilities have developed

along the coastline, including numerous caravan parks (Halcrow Group 2011, appendix D-3).

2.3 Landscape character

2.3.1 National Character Areas

In 1996 English Nature and the Countryside Commission (now combined as Natural England), with help from English Heritage, produced a map of England that depicts the natural and cultural dimensions of the landscape. Two categories were mapped: Natural Areas and Countryside Character. Natural Areas are biogeographic zones that reflect the geological foundation, the natural systems and processes and the wildlife in different parts of England. Natural Character Areas (NCAs — formerly Countryside Character Areas or CCAs) sometimes follow the Natural Areas boundaries and are described as 'unique in terms of a combination of physiographic land use, historical and cultural attributes'. Concerns about the simplistic nature of the historical and cultural attributes used to define these areas led to English Heritage's Historic Landscape Character (HLC) programme (see section 2.4.3 below). However, the NCAs provide a broad overview of landscape types and Dorset is divided into: Dorset Heaths (no 135); South Purbeck (no 136); Isle of Portland (no 137); Weymouth Lowlands (no 138); and Marshwood and Powerstock Vales (no 139) (Webster and Dawson 2008, 3–4, fig 1.3).

2.3.2 The Dorset Landscape Character Assessment

The Dorset Landscape Character Assessment (LCA) is a detailed assessment of the character of the county which works within the national framework of CCAs and Natural Areas to identify variations in landscape character at sub-regional level. The Dorset LCA was undertaken by Dorset County Council's Natural Environment Team with assistance from the Dorset AONB team and other key partners.

The purpose of the assessment was to provide practical, readily accessible information and guidance which can contribute to the conservation and enhancement of the special characteristics of the county as a whole, and the distinctiveness of its individual character types. It helps us to understand how the landscape has evolved and helps to make informed decisions about the management of future change.

The Dorset LCA offers an evidence base for policy development and for future plans/reviews of strategic documents such as AONB, Jurassic Coast and Coastal Corridor management plans and Green Infrastructure strategies. It can help provide a context for landscape management decisions, projects and initiatives and be used to help inform planning applications. In the future, the assessment can form the basis for more specific and/or detailed research, such as sensitivity studies and geographically refined studies.

The 21 County Landscape Types identified by the LCA are distinct types of landscape that are relatively homogeneous in character (Fig 2.9). They are generic, and as such may occur in different areas and parts of the UK, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement patterns.

Each landscape type has specific guidelines to help provide a broad framework for managing change. The 'overall management objective' for each type indicates the desired state for each, and the guidelines set out measures to help achieve this desired state. Guidelines have been derived from the LCA work carried out across the county, and in many cases are the same as those produced for the Dorset AONB character assessment. They can help identify priorities for conservation, enhancement, renewal or restoration in the landscape and are non-statutory. The guidelines provide a framework for action and complement guidance produced by other local authorities. It is expected that the guidelines will be of use to a range of individuals and agencies, from planners, farmers and land managers to countryside management teams and developers, as well as being of interest to the general public.

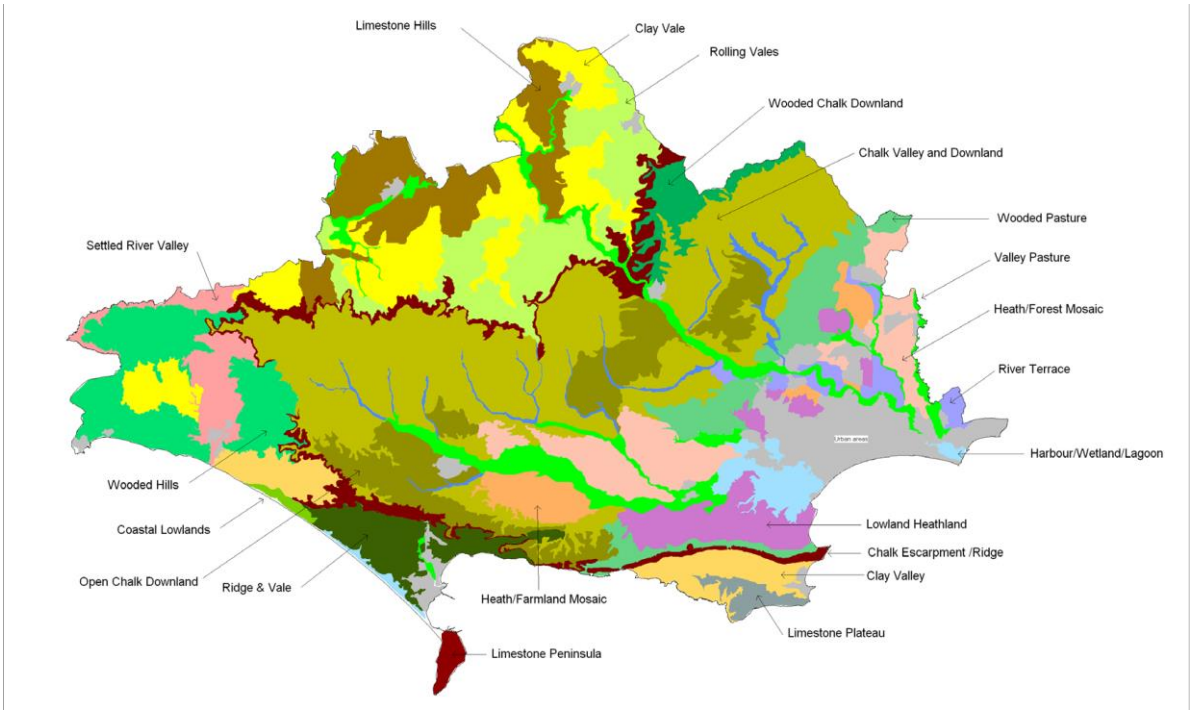


Fig 2.9 Dorset Landscape Character Assessment (Dorset County Council).

2.3.3 Dorset Coast Landscape and Seascape Assessment

The 'Dorset Coast Landscape and Seascape Assessment' was produced in 2010 by LDA Design. It is one of a number of pilot studies being undertaken to inform the C-Scope Project (Combining Sea and Coastal Planning in Europe). Initiated by the Dorset Coast Forum and the Coordination Centre for Integrated Coastal Zone Management Belgium, C-Scope is a three year Interreg-funded project, which aims to achieve a seamless, integrated approach to management and planning within the land-sea interface. The main focus is the development of marine plans at different scales using effective and proven stakeholder engagement. It will also develop an innovative and unique GIS-based planning tool to inform decision making and help to achieve sustainable coastal economies and environments.

The project also aims to help to manage the many current and future pressures facing the Dorset coast, ranging from new development and climate change to competition for space from interests such as shipping, commercial fishing, minerals extraction, recreation and renewable energy. As part of this process, it is intended that the Landscape and Seascape Assessment will take the form of a useable and accessible report (LDA Design 2010), supported by GIS mapping, that will provide a sound evidence base to help inform a wide range of planning and management decisions.

The draft report presents 12 Landscape (LCT) and 11 Seascape (SCT) Character Types. For each type the Key Characteristics are presented together with an overview of Physical Influences, Cultural Influences and Aesthetic and Perceptual Qualities. In addition the key forces for change acting on, or which potentially could act on, the Landscape or Seascape are described, together with proposed strategies to manage change, based upon the definitions recommended in the European Landscape Convention (LDA Design 2010).

2.4 Strategic historic environment projects

2.4.1 Research Frameworks

There are a number of National and Regional thematic and chronological Research Frameworks which are relevant to the Dorset RCZAS. The South West Archaeological Research Framework (SWARF) (Webster 2008) is a particularly useful source (see section 11), although unfortunately Dorset is not covered by the post-Conquest medieval section. 'People and the Sea: A Maritime Archaeological Research Agenda for England' (Ransley *et al* 2013) also provides valuable background material.

2.4.2 Waterlands Project

The Waterlands: Developing Management Indicators for Submerged Palaeoenvironmental Landscapes study was funded by the Marine Aggregate Levy Sustainability Fund (MALSF). For the purposes of Waterlands, marine palaeolandscapes were defined as sites that once comprised terrestrial archaeological sites; this project is not concerned with shipwreck archaeology (Goodwyn *et al* 2010).

The overall aim of the project was to create a suggested UK-wide 'indicator framework' for managing marine palaeolandscapes. The project outputs are of value to marine spatial planners, developers, aggregate companies, consultants, researchers, national and local heritage agencies and marine policy developers. GIS analysis and documentary research and consultation with the project steering group formed the basis for the development of a suggested UK-wide 'indicator framework' that could be adopted for marine palaeolandscapes.

2.4.3 Dorset Historic Towns Survey

The Dorset Historic Towns Survey forms part of a national programme to survey the archaeology, topography and historic buildings of England's historic towns and cities (also known as Extensive Urban Survey or EUS, supported by English Heritage). To date the project has studied 21 towns or former towns in Dorset. Coastal (and near coastal) settlements include: Abbotsbury (Davey 2011a), Bridport (Bellamy 2008), Charmouth (Bellamy and Davey 2011a), Christchurch (Bellamy and Davey 2011b), Corfe Castle (Davey 2011b), Lyme Regis (Bellamy and Davey 2011c), Swanage (Bellamy 2011), Wareham (Bellamy and Davey 2011d), Weymouth and Melcombe Regis (Bellamy *et al* 2011) and the 'lost' medieval town of Newton Studland (Le Pard and Bellamy 2011). Bournemouth and Poole will be completed in due course.

2.4.4 Historic Landscape Characterisation

Historic Landscape Characterisation (HLC) is a method of assessing and classifying an archaeologist's view of the historic cultural landscape as an aid to informing the management of the environment overall. The approach brings together historic and natural environmental datasets in a GIS format to enable the interpretative assessment of recurring 'Types' of historic landscape character and the areas in which they are expressed. This method encourages the interpretation of data in a manner transcending their isolated expressions to encourage the identification of recurring trends which characterise the historical and cultural landscape. HLC is designed to inform a broad range of applications including spatial planning, conservation and wider approaches to heritage management which emphasise the positive advantages for everyone's quality of life in raising understanding and maintaining the cultural legibility of the world we inhabit.

HLC has now been completed across almost all of England's land area. The HLC for Dorset was carried out in 2009; it was specifically designed to contribute towards the 'Dorset Landscape Character Assessment' (see above section 2.3.2) and therefore differs from other HLC projects. The report is currently in preparation (Claire Pinder, pers comm).

2.4.5 Historic Seascape Characterisation

Historic Seascape Characterisation (HSC) maintains the historic characterisation principles used in HLC but recognises the need for different expressions of those principles in the coastal and marine environment. The coastal zone to landward and seaward of mean sea level is an area of overlapping terrestrial and maritime perceptions, demanding assessment of both landward and seaward perspectives, and requiring interoperability between the overlapping HSC and HLC coverage. English Heritage's national HSC implementation has now covered all of England's coasts and inshore and offshore regions. The eastern part of Dorset is covered by the Hastings to Purbeck HSC project (Dagless and Dellino-Musgrave 2011) and the western part by the South West Peninsula HSC project (Dudley and Johns 2013).

2.4.6 The English Seafront project

English Heritage's seaside resort research programme, which culminated in the publication of 'England's Seaside Resorts' (Brodie and Winter 2007), concentrated on the development of seaside resorts as towns but, as a national overview, could not consider individual seafronts specifically and in detail. The area between low-tide and the first line of buildings is a complex space, with layers of evidence of seaside life over the past 300 years, reflecting changes to holidays and attitudes to health and entertainment. It is also a workplace, a civic space and the frontline between man and nature. Seafronts are now particularly vulnerable, with many resorts having to provide new sea defences, often at the expense of historic features such as sea walls and bathing pools.

The current English Seafront research project, also an English Heritage project, seeks to raise awareness of the special interest of the history and heritage of the seafront and contribute to improved heritage protection by increasing knowledge and promoting good practice in future schemes that involve intervention on the seafront. The key product will be an Informed Conservation book entitled 'The English Seafront', which will be published in 2016.

3 Designations

3.1 World Heritage Site

World Heritage Sites are places of 'outstanding universal value' selected by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). The Dorset and East Devon Coast World Heritage Site, known as The Jurassic Coast, is England's first natural World Heritage Site. It covers 163km (95 miles) of coastline from Orcombe Point in East Devon to Old Harry Rocks in Dorset, with rocks recording 185 million years of the Earth's history.World Heritage status was achieved because of the site's unique insight into the Earth Sciences, as it clearly depicts a geological 'walk through time' spanning the Triassic, Jurassic and Cretaceous periods.

Fig 3.1 Map of the Jurassic Coast (reproduced courtesy of the Jurassic Coast Trust).

3.2 Historic Environment Designations

3.2.1 Scheduled Monuments

There 105 Scheduled Monuments in the study area. These are listed in Appendix 3 at the end of this report.

3.2.2 Listed Buildings

There are 1838 Listed Buildings in the study area. Grade I: 38; Grade II*: 71; and Grade II: 1736. Grade I and Grade II* Listed Buildings are listed in Appendix 4 at the end of this report.

3.2.3 Registered Battlefields

There are no Registered Battlefields in the study area.

3.2.4 Registered Parks and Gardens

There are eight Registered Parks and Gardens in the study area which are listed below in Table 3.1.

NHLE no	Name	Grade	NGR
1000707	Abbotsbury Gardens	I	SY 56537 84933
1000429	Encombe	II*	SY 94469 78303
1000724	Upper, Central and Lower Pleasure Gardens, Bournemouth	II*	SZ 07439 91736
1000724	Upper, Central and Lower Pleasure Gardens, Bournemouth	II*	SZ 08815 90945
1000714	Compton Acres	II*	SZ 05270 89559
1000720	Lulworth Castle	II	SY 84881 82528
1001588	Poole Park	II	SZ 02450 90962
1001701	Durlston Castle Historic Landscape	II	SZ 03333 77141

Table 3.1 List of Registered Parks and Gardens in the study area. ***NB.*** *Upper, Central and Lower Pleasure Gardens, Bournemouth, is divided into two designated areas and therefore has two discrete entries.*

3.2.5 Protected Wreck Sites

The Protection of Wrecks Act 1973 (section 1) is designed to protect wrecks that are of historic, archaeological or artistic importance. There are currently 61 designated wreck sites in the UK. Three of these lie off the Dorset coast but they are all outside the study area. These are listed below in Table 3.2.

NHLE no	Name	NGR
1000045	The Studland Bay wreck, Poole, a late fifteenth – early sixteenth-century Spanish vessel, designated in 1984	SY 56537 84933
1000082	The Swash Channel wreck, Poole Harbour Approaches, an early seventeenth-century vessel, designated in 2004	SY 94469 78303
1000083	The West Bay wreck, West Bay, *c* eighteenth century, designated in 2005	SZ 07439 91736

Table 3.2 List of Protected Wreck Sites off the Dorset coast.

3.2.6 Protected Military Remains

The Protection of Military Remains Act, 1986, deals with military remains of both aircraft and ships. All military aircraft and vessels are automatically designated under this legislation which is administered by the Ministry of Defence (RAF for aircraft, Navy for vessels). Under the Protection of Military Remains Act there are two levels of protection afforded wreckage. They can be designated as:

- A Controlled Site, which is a restrictive designation, requiring licensing of certain activities within the exclusion zone and knowledge of precise co-ordinates.
- A Protected Place, which is where activities are permitted in the vicinity of a vessel, on a look but don't touch basis. Knowledge of precise co-ordinates is not required, only the name of the vessel.

There are currently four Protected Military Remains sites off the Dorset coast: *HMS Boadicea*, *HMS M2*, *HMS Formidable* and *HMS Blackwood*; all are outside the study area.

3.2.7 Heritage Coast

There are 43 designated Heritage Coasts in England and Wales, covering about one-third of the coastline. There are two in Dorset, which cover most of the coastline to the west of Poole Harbour. 'Heritage Coast' is a non-statutory designation which was initiated in 1972 with a view to protecting coastlines of special scenic and environmental value from undesirable development. Much of the designated coastline is owned by the National Trust who have their own coast and marine policy (The National Trust 2006) and Coast Risk Assessment for the Wessex Region (The National Trust nd).

The West Dorset Heritage Coast extends from Seaton in the west of the county, eastwards to Portland. The Purbeck Heritage Coast extends from Weymouth Bay around to Poole Harbour. The designation excludes towns such as Lyme Regis, Bridport, Weymouth, Portland and Swanage.

3.2.8 Conservation Areas

There are 177 Conservation Areas in Dorset. Conservation areas are designated by local planning authorities as areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. They may vary in character, form and size but their designation means that they are all worthy of protection as areas of special merit. They usually contain buildings which are 'listed' but this is not a prerequisite of designation.

The following settlements within the project area have Conservation Areas (the larger settlements each have a number of discrete Conservation Areas): Christchurch, Weymouth and Portland, Poole, Bournemouth, Swanage, Wareham, Studland, West Lulworth, Stoborough, West Bay, Charmouth, Eype, Langton Herring, Lyme Regis, Abbotsbury.

3.3 Natural Environment Designations

3.3.1 Dorset Area of Outstanding Natural Beauty

Areas of Outstanding Natural Beauty (AONBs) were brought into being by the National Parks and Access to the Countryside Act of 1949. The Countryside and Rights of Way Act 2000 strengthened the conservation and management of AONBs in partnership with local authorities.

The Dorset AONB was designated in 1959 and is the fifth largest in the country, covering approximately 42% of the county. It stretches from Lyme Regis in the west along the coast to Poole Harbour in the east (covering half of Poole Harbour, Brownsea Island and the smaller islands) and north to Hambledon Hill, near Blandford Forum. The AONB includes a variety of landscapes, from the high chalk downs to lower arable areas, and also includes the Jurassic Coast World Heritage Site. The designated area ends at mean low water mark. A number of small market towns occur in the AONB including Lyme Regis, Bridport, Beaminster and Swanage. Much of the RCZAS study area lies within the southern part of the AONB.

The AONB Management Plan is updated every five years and is coordinated by the AONB Partnership, representing local authorities, statutory agencies and landowners. The Partnership also has dedicated staff. The Plan is a statutory requirement and guides and informs all other plans and activities within the AONB area. It is a material consideration in planning decisions and Natural England is consulted as a matter of course. Conservation and enhancement of landscape character and quality underpins the Management Plan for the AONB.

3.3.2 Marine Conservation Zones

The Marine and Coastal Access Act 2009 (Part 5) enabled Defra Ministers to designate and protect Marine Conservation Zones (MCZs). These are a type of marine protected area, which will exist alongside European marine sites [Special Areas of Conservation

(SACs) and Special Protected Areas (SPAs)], SSSIs and RAMSAR sites to form an ecologically coherent network of marine protected areas. Similar schemes are operating in Wales and Scotland and soon in Northern Ireland to contribute to a UK-wide network of Marine Protected Areas.

Twenty-seven new MCZs were created in 2013, of these the Chesil Beach and Stennis Ledges MCZ is within the Dorset RCZAS study area (Fig 3.2) and The Poole Rocks MCZ is just outside.

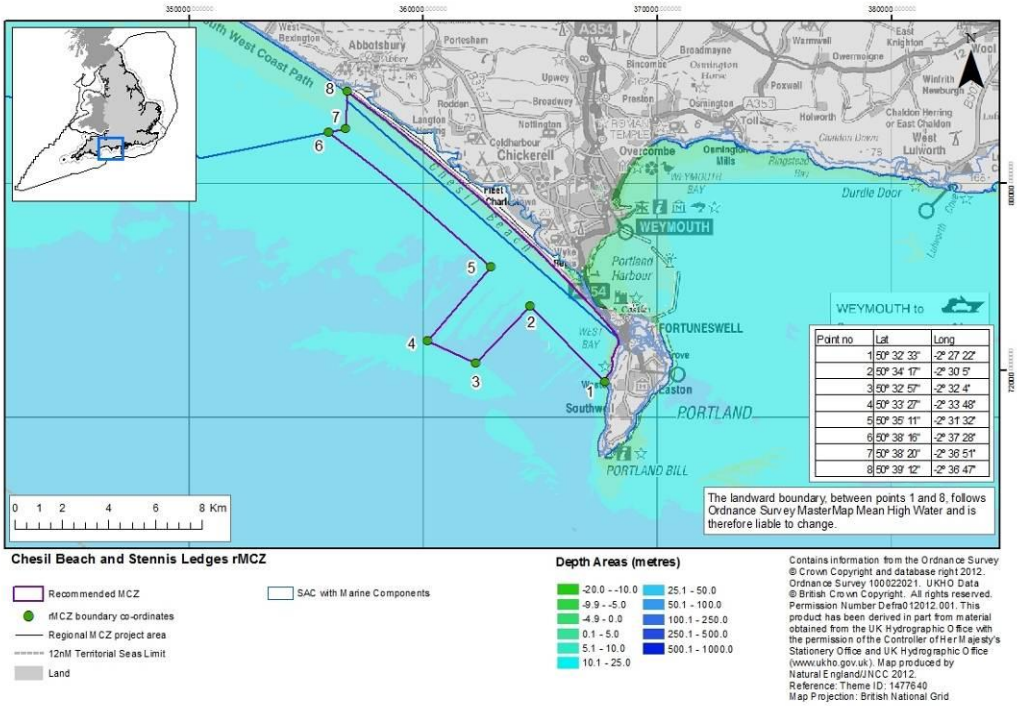


Fig 3.2 The Chesil Beach and Stennis Ledges MCZ (contains, or is based on, information supplied by Natural England).

3.3.3 RAMSAR sites

The international RAMSAR Convention of 1971 requires the government signatories to agree to identify and protect their most significant wetlands for wildlife, especially waterfowl. Under the Convention, each government must select its best wetlands according to very clear criteria, and these RAMSAR Sites are then protected from development in all but the most exceptional cases. Four RAMSAR sites occur along the Dorset coast: Chesil Beach and the Fleet; Dorset Heathlands; Poole Harbour; and the Avon Valley.

3.3.4 Special Protection Areas (SPAs)

The European Community directive for the Conservation of Wild Birds (1979) defines the duties of Member States generally in relation to all species of wild birds and in particular to preserve enough wild places to safeguard migratory and vulnerable bird species. These are to form a network of protected areas called Special Protection Areas (SPAs). There are three SPAs of international importance for birds, Poole Harbour, Dorset Heathlands and Chesil Beach and the Fleet, which are also RAMSAR sites.

3.3.5 Special Areas of Conservation (SACs) and Draft SACs

The European Directive on the Conservation of Natural Habitats (1992) requires Member States to identify and designate areas of land as Special Areas for Conservation (SACs) for their importance as habitats for species other than birds.

There are nine SACs within the Dorset AONB including the coastal SACs of Chesil and the Fleet, Dorset Heaths, Dorset Heaths (Purbeck and Wareham) and Studland Dunes, Isle of Portland to Studland Cliffs, St Alban's Head to Durlston Head and Sidmouth to West Bay.

3.3.6 Site of Special Scientific Interest (SSSIs)

Within the study area there are 62 Sites of Special Scientific Interest (SSSIs), representing approximately half of all the SSSIs occurring within Dorset. These sites have been notified in order to maintain selected communities of plants and animals within a broad range of habitats including chalk and limestone grassland, which is found along the coast, lowland heathland in the eastern part of the county, estuaries, maritime coast and cliffs, dunes, ancient meadows and woodland. Outstanding geological features and landforms are also included, such as along the Jurassic Coast.

3.3.7 National Nature Reserves (NNRs)

There are eight National Nature Reserves (NNRs) within the study area, which encompass some of the prime chalk grassland and heathland habitats. Natural England is responsible for designating areas as NNRs to secure protection and appropriate management of the most important areas of wildlife habitat, to provide a resource for scientific research and to provide for recreation provided this does not compromise the wildlife habitat.

3.3.8 Geological Conservation Review Sites (GCR) and Regionally Important Geological Sites (RIGS)

GCRs are non-statutory, nationally important Geological Conservation Review Sites, of which there are 66 in the World Heritage Site alone. RIGS are non-statutory Regionally Important Geological Sites of which there are 13 concentrated around the Isle of Purbeck. Dorset's Important Geological Sites Group (DIGS) was founded in 1993, following the Government's requirement that Regionally Important Geological Sites (RIGS) not already adopted as SSSIs, be registered by District Councils to ensure their protection by the planning process. Since the District Councils had little specialist expertise available, DIGS was formed by enthusiasts in the county to help with the process. DIGS is affiliated to UKRIGS and Dorset Wildlife Trust.

3.3.9 Sensitive Marine Areas (SMAs)

Sensitive Marine Areas (SMAs) are non-statutory marine areas notable for their marine animal and plant communities or which provide ecological support to adjacent statutory sites. A particular aim of the designation is to raise awareness and disseminate information to be taken into account in estuarine and coastal management planning. These areas rely on the co-operation of users and local communities for sustainable management. These designations overlap with SSSIs, SACs or draft SACs and cover the features these sites are intended to protect. There are three SMAs in Dorset: Poole Bay and Isle of Purbeck; Portland and the Fleet; and Lyme Bay.

3.3.10 Nature Improvement Areas (NIAs)

Section 2 of the Natural Environment White Paper published in June 2011 refers to the integration of people and nature and the implementation of Nature Improvement Areas (NIAs) and in July 2011 Defra launched a new grant scheme competition administered by Natural England to establish NIAs. Of the first 12 current NIAs the coastal boundary of 'Wild Purbeck' lies within the study area.Nature Improvement Areas (NIAs) are large, discrete areas intended to deliver a step change in nature conservation, where a local partnership has a shared vision for their natural environment. The partnership will plan and deliver significant improvements for wildlife and people through the sustainable use of natural resources, restoring and creating wildlife habitats, connecting local sites and joining up local action. They are not designated.

4 Coastal change from the Palaeolithic to the present

4.1 Introduction

Flints unmistakably made by humans excavated at Happisburgh site 3 are about 900,000 years old and the most ancient tools ever found in Britain, http://www.nhm.ac.uk/nature-online/life/human-origins/humans inbritain/map/index.html, accessed 8 January 2015.

This supersedes the previously accepted dates of *c* 680,000 BP or *c* 750,000 BP for the earliest hominin presence in the islands from discoveries from the Cromer Forest-bed formation at Pakefield on the Suffolk coast (Parfitt *et al* 2005) and *c* 500,000 BP which primarily reflected the chronology from Boxgrove, Sussex (Roberts and Parfitt 1999; *cf* Hosfield *et al* 2008, 24).

The Palaeolithic and Mesolithic fall within the Quaternary Period, the most recent subdivision of the geological record. The Quaternary is divided into the Pleistocene and Holocene epochs and, at *c* 10,000 BP, the Late Upper Palaeolithic to Early Mesolithic transition broadly coincides with the start of the Holocene. The chronology of the British Palaeolithic and Mesolithic is discussed here in terms of oxygen isotope stages (OIS) for the Lower and Middle Palaeolithic (c 900,000–40,000 BP), while the Upper Palaeolithic and Mesolithic periods (c 40,000–5500 BP) are discussed with reference to named sub-stages of the Quaternary Devensian glaciation and the Holocene, reflecting the nature of existing geochronological schemes (*cf* Hosfield *et al* 2008, 23-4). The key periods are set out below in Table 4.1

Lower Palaeolithic	900,000–250/200,000 BP
Middle Palaeolithic	250/200,000–40,000 BP
Upper Palaeolithic	40,000–10,000 BP
Early Mesolithic	10,000–8500 BP
Later Mesolithic	8500–5500 BP

Table 4.1 Key periods for the Palaeolithic and Mesolithic in Britain based on the SWARF Resource Assessment for the Palaeolithic and Mesolithic (Hosfield et al 2008, 24) updated in the light of the Happisburgh evidence

The Palaeolithic and Mesolithic fall within the Quaternary Period, the most recent subdivision of the geological record. The Quaternary is divided into the Pleistocene and Holocene epochs and, at *c* 10,000 BP, the Late Upper Palaeolithic to Early Mesolithic transition broadly marks the start of the Holocene. The chronology of the British Palaeolithic and Mesolithic is discussed here in terms of oxygen isotope stages (OIS) for the Lower and Middle Palaeolithic (*c* 900,000–40,000 BP), while the Upper Palaeolithic and Mesolithic periods (*c* 40,000–5500 BP) are discussed with reference to named sub-stages of the Quaternary Devensian glaciation and the Holocene, reflecting the nature of existing geochronological schemes (*cf* Hosfield *et al* 2008, 23-4).

4.2 Lower, Middle and Early Upper Palaeolithic (*c* 700,000–12,000 BP)

Between 1 million years ago and *c* 400,000 BP Britain was joined to the mainland of Europe by a high chalk plateau, the Weald-Artois anticline, which extended from southern Kent across to northern France and provided a solid link even at times of interglacial high sea-level (Gibbard 1988; Stringer 2006). At some time between 400,000 and 200,000 BP this chalk ridge was breached and at subsequent periods of interglacial high sea level Britain and Ireland was cut off from Europe. The extent of glaciation limited the areas which were inhabitable and also determined the actual sea level, and hence the coastline (Maritime Archaeology 2007, 24).

The Middle Pleistocene (*c* 780,000–125,000 BP) is characterised by a series of glacials (even-numbered OIS) and interglacials (odd-numbered OIS) with conditions generally alternating between wooded environments (associated with full interglacial conditions), open steppe grasslands (associated with early glacial conditions) and glacial tundra (associated with full glacial conditions) (Hosfield *et al* 2008, 24). Over half a million years ago the Dorset coast was some 10km north of its present location; when the sea level fell slightly saltmarshes and coastal grassland formed over the sandy beaches which it left in its wake. Animals such as giant deer, red deer, bison, horse and even elephant and rhinoceros grazed on the new coastal plain, together with animals like lion, hyena and wolf that preyed on them. There are traces of early people who lived at Boxgrove in West Sussex, living off the land and the game (Stringer and Andrews 2006, 72).

The Late Pleistocene (*c* 125,000–10,000 BP) is slightly more complicated, reflecting the higher resolution records available for this period, as demonstrated by the results of the (Oxygen Isotope) Stage Three Project which studied Neanderthals and modern humans in the European landscape at this time (van Andel and Davies 2004). In general, the Late Pleistocene for Britain can be summarised as follows (after Stringer and Gamble 1993; Barton 1997):

- Stage 5e (128,000–117,000 BP) Full interglacial conditions (oak/elm woodland, hot summers and mild winters).
- Stages 5d–5a (117,000–71,000 BP) Generally cool temperate conditions with oscillations between warm interstadial (5c and 5a with forest habitats) and cool stadial environments (5d and 5b with tundra-type habitats).
- Stage 4 (71,000–59,000 BP) Very cold conditions (although Britain was predominantly ice-free, open tundra habitats were dominant, with short, mild summers and long, cold winters).
- Stage 3 (59,000–24,000 BP) Generally cold and dry conditions, although the period is characterised by sharply oscillating climates (indicated by ice core records: see below), ranging between milder periods (featuring woodland development, although on a reduced scale compared to OIS- 5c and 5a) and short cooling episodes, in which dry, grassland 'mammoth-steppe' environments were dominant.
- Stage 2 (24,000-13,000 BP) Full glacial conditions, with extensive ice sheets in northern England, Wales and Scotland, and barren, polar-desert type environments (*cf* Hosfield *et al* 2008, 24).

Since the Last Glacial Maximum (LGM) *c* 18,000 BP mean sea level has risen some 120–140m (Fig 4.1), but understanding the change has to take account of a complex interaction of regional and local factors (Hosfield *et al* 2008, 27). Table 4.2 (below) provides an approximate indication of relative sea-level variations within the English Channel region since the Lower Palaeolithic.

Approximate Age	Relative Sea Level	OIS	Comments
2400 BC	-2m	-	Early Bronze Age
***c* 3750 BC**	-5m	-	Early Neolithic
***c* 5400 BC**	-10m	-	Late Mesolithic
***c* 6300 BC**	-15m	-	Beginning of the Late Mesolithic; land bridge to the continent finally removed
***c* 8000 – *c* 7000 BC**	-20m	-	Mid-Mesolithic
***c* 8000 BC**	-45m	-	Early Mesolithic
***c* 8500 BC**	*c* -50	1	Beginning of true Early Mesolithic
***c* 9500 BC**	-65m	1	Late Upper Palaeolithic/Early Mesolithic, transition between Loch Lomond Stadial and Flandrian Interglacial.
***c* 11,000 BP – *c* 11,000 BC**		1	Late Upper Palaeolithic, during the Loch Lomond Stadial
***c* 12,000 BP**	-90m	1	Late Upper Palaeolithic, middle of the Late Glacial/Windermere Interglacial
***c* 13,500 BP**		2	Mid to late Upper Palaeolithic, within the Devensian Glaciation / Dimlington Stadial Biozone
***c* 18,000 BP**	-120m	2	Early to mid Upper Palaeolithic period, following the Devensian glaciation
***c* 40,000 BP**	-50m	3	Late Middle Palaeolithic period. Devensian Chronozone, during the Upton Warren/ Chelford Interglacial. Britain probably not occupied
***c* 122,000 BP**	+5m	5e	Early Middle Palaeolithic period. Ipswichian interglacial; raised beaches laid down inland from the present day south coast
***c* 128,000 BP**	Low?	6	
***c* 186,000 BP**	High?	7	Interglacial
***c* 250,000 BP**	Low?	8	
***c* 300,000 BP**	High?	8	Interglacial
***c* 340,000 BP**	High?	10–11	Hoxnian interglacial
***c* 425,000 BP**	-120 m+?	12	Anglian glaciation, resulting in first breach of continental land-bridge. Sea level probably at its lowest recorded level around the British Isles
***c* 480,000 BP**	+5-10 m?	13	Cromerian interglacial. Raised beaches laid down inland from present day south coast

Table 4.2 Relative sea-level changes since the Lower Palaeolithic (from Wessex Archaeology 2007; the Oxygen Isotope Stages are from Wymer (1999: table 2); the sea levels are drawn from Wenban-Smith (2001, 15-17, figure 6), Jelgersma et al (1979) and Coles (1998).

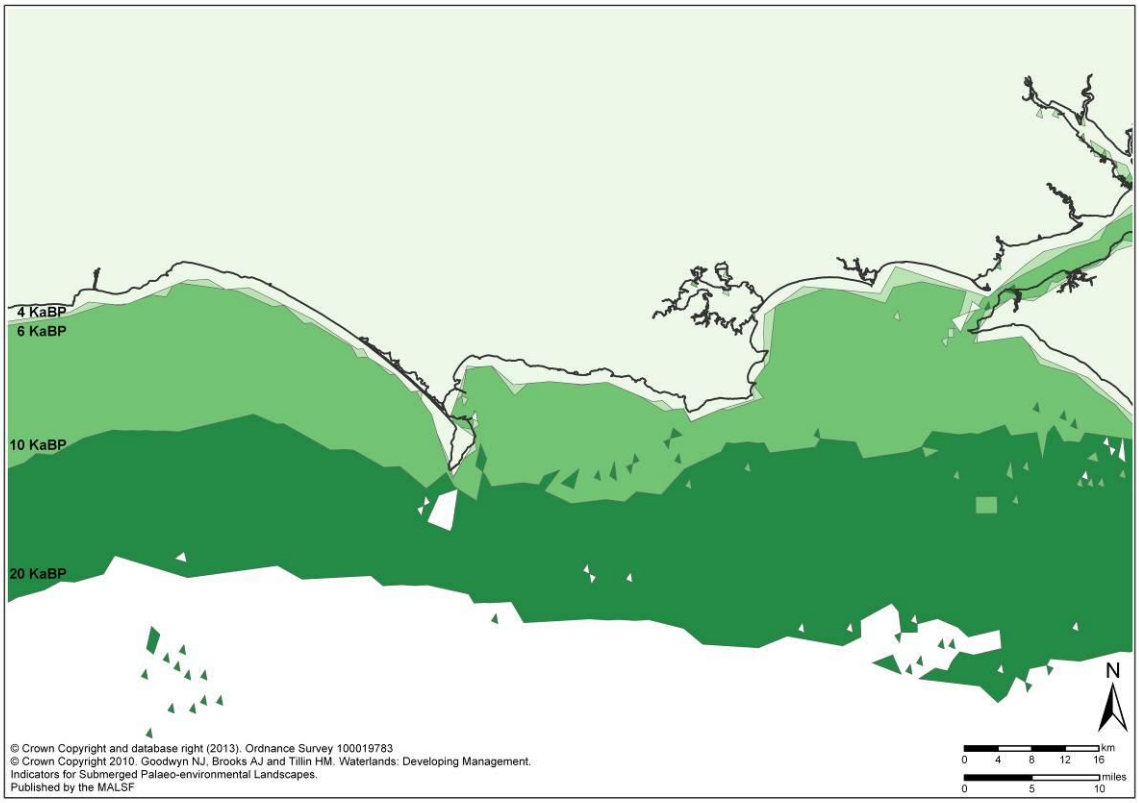


Fig 4.1 Map extrapolated from the Waterlands Project data showing the projected changes to the Dorset coastline since 20,000 (20 ka) BP.

Fig 4.2 Hengistbury Head (© Hengistbury Head: Explore- Learn – Discover).

4.3 Late Upper Palaeolithic and Mesolithic (*c* 12,000 – 5500 BP)

The palaeogeography of the submarine area around much of the South West is not as well understood as for the south and east coasts of England. However, in some areas a substantial portion of the dry land that was available to the Late Upper Palaeolithic population who re-colonised England after *c* 12,600 BP had been inundated by the sea by *c* 7000 BP (*c* 5990–5750 cal BC). Marine charts and core data give an idea of the bathymetry around the coast and offshore, though they cannot take account of offshore erosion processes or any isostatic effects (Hosfield *et al* 2008, 27).

Mean sea level in the region has risen 30–40m in the last 10,000 years (Fig 4.1). The average thermoluminescence age of 9750±950 years BP indicates an occupation during the Boreal or pre-Boreal, when Hengistbury may have been as much as 20 km inland of the contemporary coastline (Barton 1992, 273). From the beginning of the Holocene, however, temperatures appear to have risen very rapidly and this climate change caused the last marine transgression. By *c* 7-6000 BP the shape of the present coastline was roughly formed, with mean sea level in the order of 4–6m lower than at present (Barton 2005, 29; Hosfield *et al* 2008, 27).

Velegrakis *et al* (1999; 2000) have discussed the evolution of the Late Pleistocene/Holocene upstream section of the Solent River, where the Rivers Frome, Piddle/Trent, Stour and Avon flowed along an east-west trending watershed incised on Tertiary sediments and contained by a chalk ridge that linked Purbeck and the Isle of Wight. The chalk ridge may have been breached by 5500 to 5000 BC, whereby disruption of the Solent River and formation of the Western Solent occurred and caused embayment inundation of Poole Bay and Christchurch Bay and formed Poole and Christchurch Harbour. However, more work is still required to determine offshore palaeochannels for Dorset's western rivers and their association with the developing English Channel (Wessex Archaeology 2004a, 5-6; Le Pard 2010a, 11–12).

Chesil Beach is one of the most iconic features of the Dorset coast. Although its formation is not fully understood it is believed to have been formed by the landward migration of sediments scoured up during the Holocene sea level rise (SCOPAC 2003, 2). The beach, which is 20m high in places, is adjacent to the coastline as far east as Abbotsbury where it becomes backed by the Fleet, a shallow tidal lagoon, as far as Chesilton. The movement of the beach can be traced on historic maps and the on-shore migration is confirmed by peat deposits which underlie the present beach (Hart 2009, 146–7).

4.4 Later prehistoric and Roman (3500 BC – AD 410)

The coastline of southern England as it exists today was probably in its current recognizable form by the Late Bronze Age, *c* 1000 BC, with localised variations caused thereafter by erosion and deposition related to sea-level change, tidal dynamics, climate change and anthropogenic activities. The rate of coastal erosion is significantly affected by climatic variation (Carver and Loveluck 2013, 114).

In the Iron Age the volume of water from the rivers Stour and Avon would have kept what is now Christchurch Harbour clear of silt. Since then there have been some changes in coastal topography and a long sandbank has formed, behind which a marsh has developed (Cunliffe 2001, 403).

Evidence for submerged Roman settlements has been found to the east of Brownsea Island and the presence of various other find spots within the harbour suggests that the Roman foreshore is now submerged (Wessex Archaeology 2004, 21).

4.5 Early medieval to modern (AD 410 – *c* 2000)

Coastal change in the medieval period was characterised by local stories of gradual small-scale changes punctuated by influential 'events' (Adams and Flatman 2013, 141). There is little evidence that the climatic changes of the 'medieval warm period' (*c* 950–

1250) or the 'Little Ice Age' that followed had an effect on England's coastal evolution (Hughes and Diaz 1994). However, coastal instability seems to have been widespread and in key areas localized processes caused considerable change. The thirteenth, fourteenth and fifteenth centuries also saw significant storm surges in the North Sea and eastern English Channel (Galloway 2009; Long *et al* 1998).

The earliest known reference to land reclamation on the Dorset coast occurs in the accounts for the manor of Wyke in the years 1242–43; a priest, Anselm, is recorded as paying a rent of 4d for a piece of land reclaimed from the sea at Weymouth. Reclamation of the shore and marshes around Weymouth has continued spasmodically until the present day with town records referring to 'landfill' or town refuse being used to reclaim land around jetties to increase wharfage in the sixteenth century (Wessex Archaeology 2004a, 14).

Sea-level and climate change had ceased to be driving factors in coastal evolution by the early sixteenth century (Long 2000) and the storm surges of the 1200–1400s were no longer common (Murphy 2009, 33–6). There were, however, still occasional severe storms, such as the great storm on the Dorset coast on 26 November 1706 described by Daniel Defoe, which also destroyed most of the windmills in England and caused cliff erosion and breaching of coastal barriers. The 'great gale' of 23–24 November 1824 raised the sea level 2m above high tide and reportedly caused fatalities in Portland and Weymouth (Le Pard 1999). However, it was anthropogenic change that principally reshaped the coastline in the post-medieval and modern periods (Dellino-Musgrave and Ransley 2013, 166).

An unsuccessful attempt was made in the 1630s to drain the Fleet and reclaim the land and in the later seventeenth century an attempt was made to reclaim part of it (Le Pard 2002; 2010a, 114-8). An area of about 6000 sq m appears to have been drained and reclaimed, the scheme being linked to Fleet Manor (Le Pard 2000). The formal garden at Fleet Manor is unlikely to have survived the storm of 1824 which caused extensive damage along this section of the Dorset coast (Le Pard 1999).

The later nineteenth-century First Edition OS map shows numerous areas 'liable to flood' around the margins of Christchurch Harbour, but by the Second Edition the risk of inundation in these areas appears to have been reduced by the construction of flood defences. In addition, extensive reclamation, particularly of Studland, can be identified by comparison between Treswell's Map of 1580 and Woodward's Map of 1775 (Wessex Archaeology 2004a, 14).

During the last 150 years, climatic and sea-level change has had relatively minimal impact on coastal evolution. 1850 is generally agreed as the last minimum of the Little Ice Age but the climatic changes associated with it do not appear to have had a significant effect on sea level around England (Long 2000). Instead, coastal evolution in the modern period has been characterised by sporadic and localised changes, the silting up of rivers and embayments or the removal of spits by storm events and, in some areas, significant coastal erosion. The most significant impacts have been anthropogenic, from large-scale port and resort developments to small-scale reclamations and defences and even the rise of coastal management programmes (Parham and Maddocks 2013, 187; Murphy *et al* 2009).

The present-day appearance of the Dorset coastline is the result of erosion, often gradual and almost imperceptible but sometimes sudden and cataclysmic — the extreme storms of the winter of 2013/14, for example, changed the coastline dramatically in places. Along the length of the coastline there is evidence of rock falls, topples, slides and mudflows described under the generic term 'landslide'.

The classic landslide is seen in the Axmouth to Lyme Regis Undercliffs, where there has been a long period of instability, probably extending back though much of the Pleistocene. The area was made famous by the major landslide at Bindon on Christmas Day 1839 (Hart 2009, 148–9). West Dorset has two of the most famous landslides in

the UK: Black Ven and Stonebarrow. Black Ven has been intensively studied and is the most active and complex landslide in the British Isles (*ibid*, 151).

The fascinating coastal scenery of Dorset drew artists and gentry who were studying the emerging science of geology, such as Sir Henry Englefield (1816), who wrote, with Thomas Webster, detailed accounts of the geology and antiquities of Dorset, as well as preparing geological maps and cross sections. The landsliding events at Lyme Regis, Black Ven and Charmouth were recorded as fine lithographs, which can be seen in Lyme Regis Museum (McInnes and Stubbings 2011, 69-70).

Hart (2009, 147) identifies five major types of landslide on the Dorset coast.

- Fall: where blocks fall directly from a cliff onto the surface below, usually from a well-jointed or fractured hard lithology;
- Topple: where blocks break away from a cliff and cascade to the surface below (often associated with bedded rocks inclined towards the cliff line, or where the face is undercut by erosion;
- Slide: a landslide in normal parlance where a lubricated block slides (or often rotates on a curved surface) away from a cliff;
- Spread: where a layer of rock, often sitting on a lubricated clay or other discontinuity, flows or spreads over the underlying surface; and
- Flow: where lubricated or liquefied sands and clays (=mudflow) flow down a slope and out across the beach or underlying surface.

4.6 The Southwest Strategic Regional Coastal Monitoring Programme

The Southwest Strategic Regional Coastal Monitoring Programme provides a consistent regional approach to coastal process monitoring, providing information on the development of strategic shoreline management plans, coastal defence strategies and operational management of coastal protection and flood defence. The Programme covers over 1000km of open coastline between Portland Bill in Dorset and Beachley Point in Gloucestershire. Large quantities of data are made freely available from the survey and analysis programme (for example, Fig 4.3); this has proved useful to Local Authorities within the region, the Environment Agency, consultants in coastal defence, conservation management and academic research, and for educational purposes.

The Programme is managed on behalf of the Coastal Groups, in partnership with the maritime Local Authorities and the Environment Agency Southwest Region. The Programme is funded by Defra, with Teignbridge District Council acting as the lead authority http://www.channelcoast.org/southwest/programme_aims/

4.7 Poole Harbour

The question of sea-level changes around Poole Harbour has posed an important archaeological problem for many years (May 1969; Bowen 1975-6). A research group was established about 30 years ago to investigate this (Horsey 1981, 146), although no outputs from that project have been identified by this RCZAS.

Mid- to late-Holocene relative sea-level change in Poole Harbour was studied by Edwards (2001) using foraminiferal transfer function for mean tide level (MTL), in combination with AMS radiocarbon-dated material, to construct a record of relative sea-level (RSL). These data, based on multiple cores from duplicate sites, indicated four phases of change during the last 5000 years: (1) rising RSL between *c* 4700 BP and *c* 2400 BP; (2) stable to falling RSL from *c* 2400 BP until *c* 1200 BP; (3) a brief rise in RSL from *c* 1200 BP to *c* 900 cal BP, followed by a period of stability; (4) a recent increase in the rate of RSL rise from *c* 400–200 BP until the present day. In addition, they suggest that the region has experienced long-term crustal subsidence at a rate of 0.5 mm C14 yr^{-1}. Although this can account for the overall rise in MTL observed during

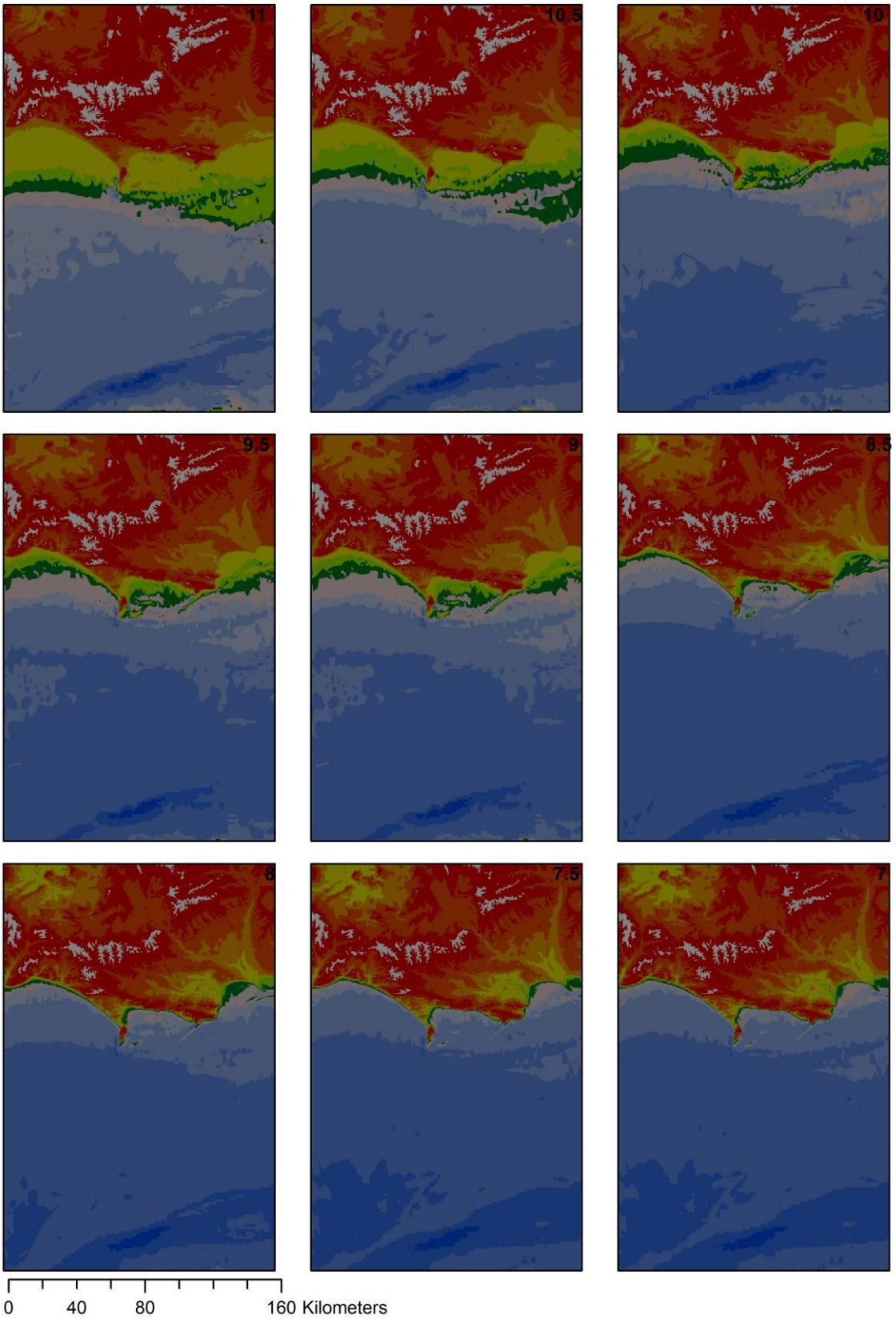
the past 2500 years, it fails to explain the changes in the rate of rise during this period. This implies that the phases of RSL change recorded in the marshes of Poole Harbour reflect tidal range variations or 'eustatic' fluctuations in sea-level.

Long *et al* (1999) identified an increase in Pinus pollen in a sediment core collected from a saltmarsh in Poole Harbour dated to *c* AD 1750, reflecting the historically documented spread of coniferous plantations across the region. They used this biostratigraphic age horizon, together with other pollen and radiocarbon data, to analyse long- and short-term rates of sediment accretion and sea-level change. A basal radiocarbon date indicated a rise in relative sea-level since 1510–1260 BC of 1.99m, at a rate of approximately 0.59 mma^{-1}. Between *c* AD 1750 AD and c AD 1890 AD sediment accretion rates rose from 0.29 mm a^{-1} to 1.14 mma^{-1}, perhaps reflecting an acceleration in relative sea-level rise. These rates increased further to 7.17 mma^{-1} after *c* AD 1890, following the development of a *Spartina anglica* dominated saltmarsh in Poole Harbour. The results demonstrated that caution should be exercised when using sediment accretion rates from saltmarshes recently colonised by *S. anglica* as proxy data for sea-level rise.

The previous work on sea level rise in the harbour has provided relative data (Edwards 2001) but does not take into account that prior to the Roman marine transgression Poole Harbour was mainly saltmarsh, with a network of creeks and rivers through the wetland covering approximately 25% of the harbour's current area. Evidence for Roman occupation has been found in the intertidal zone off Brownsea Island (Jarvis 1992). Prehistoric period water flow and sediment rates were different from those known today so in order to assess past land / water boundaries it is not sufficient or appropriate to use modern bathymetry to identify past contours. The change in sea level has also affected the fortunes of the towns around Poole harbour, with the shoaling and silting of the Wareham channel leading to the decline of Wareham and the rise of Poole. Modern deposition in Poole Harbour is exacerbated by the intensive dredging regime, which releases much sediment from the channels to be deposited elsewhere. The nature of vegetation has also changed and the colonization of Poole Harbour by spartina since 1890 has impacted on the retention and release of sediments on the harbour fringes (May 1969).

4.8 Palaeogeographic models for the Dorset coast

The palaeogeographic models presented in Figure 4.3 have been produced for this project by Dr Fraser Sturt of Southampton University, and show the changing palaeogeography of the study area from 11,000 BP to the present day at 500-year intervals. The images utilise a recent Glacial Isostatic Adjustment (GIA) model (Bradley *et al* 2011) and data from bathymetric surveys to generate new high temporal and spatial resolution reconstructions. In turn, these outputs are queried to allow for quantification of variable rates and extents of inundation over the study area. The models have some inherent flaws but remain archaeologically valuable. The flaws stem from the fact that sedimentation and erosion over the Holocene will have changed the morphology of the seabed and land surfaces. As such, some of the topographic highs and lows rendered in these images relate to on-going geomorphological processes, rather than the specifics of past topography. Furthermore, the images presented here do not account for possible changes in tidal range, although recent work by Cazenave (2012) indicates that beyond the southern North Sea basin there has been little change in tidal range over the last 8000 years. Finally, the resolution of the model at the outer margins, where GEBCO data was relied on, means that the ability to pick out surviving bathymetric relief is diminished. The consequence of these known flaws is that the palaeogeographic models are broadly representative of past change, but will constantly need to be refined through empirical observation by both archaeologists and earth scientists. In addition, more work needs to be done on attempting to account for sedimentation and erosion over the study period. That being said, the models presented here offer an important way forward with regard to quantifying degrees of change, and attuning our minds to its implications (Sturt *et al* 2013).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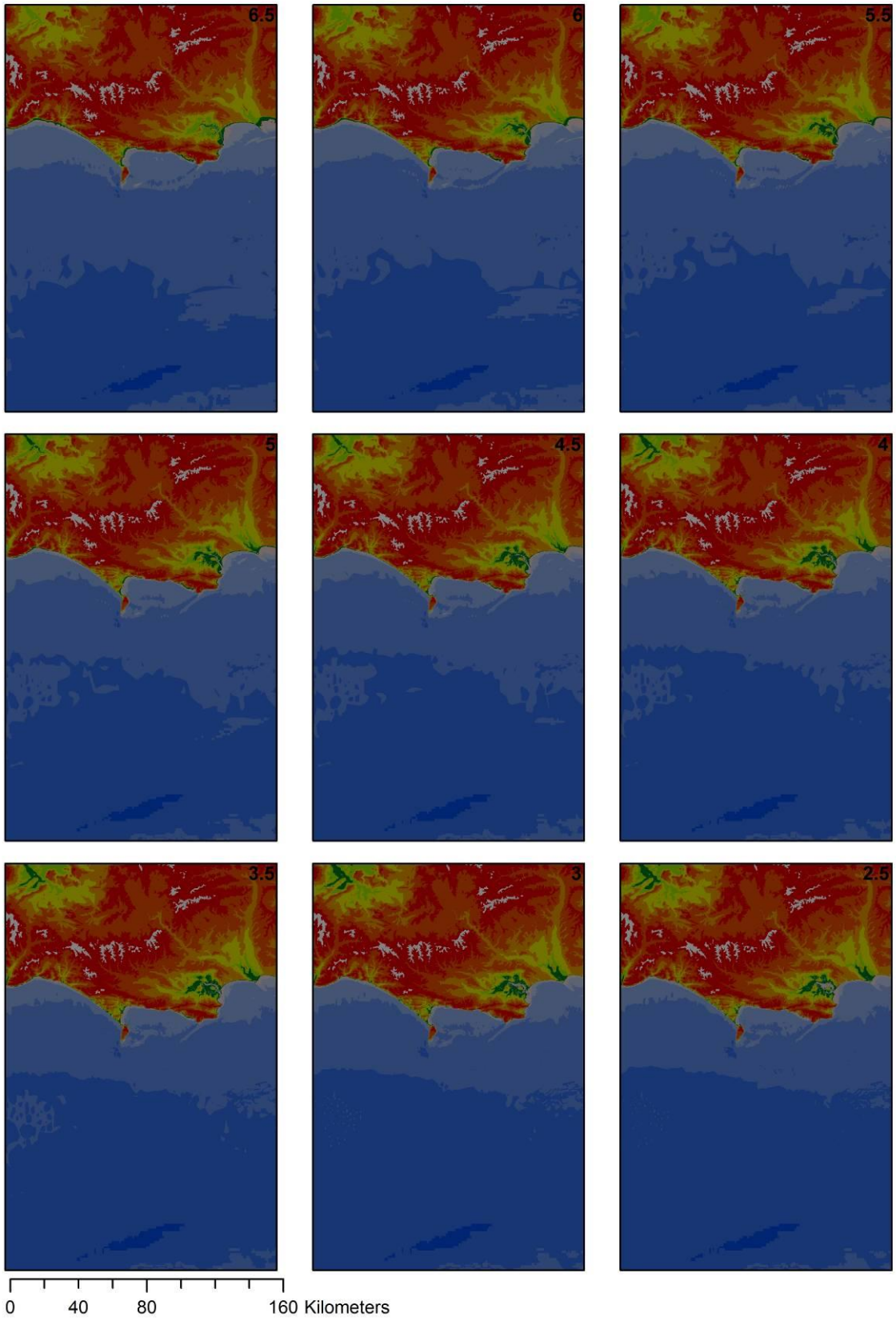
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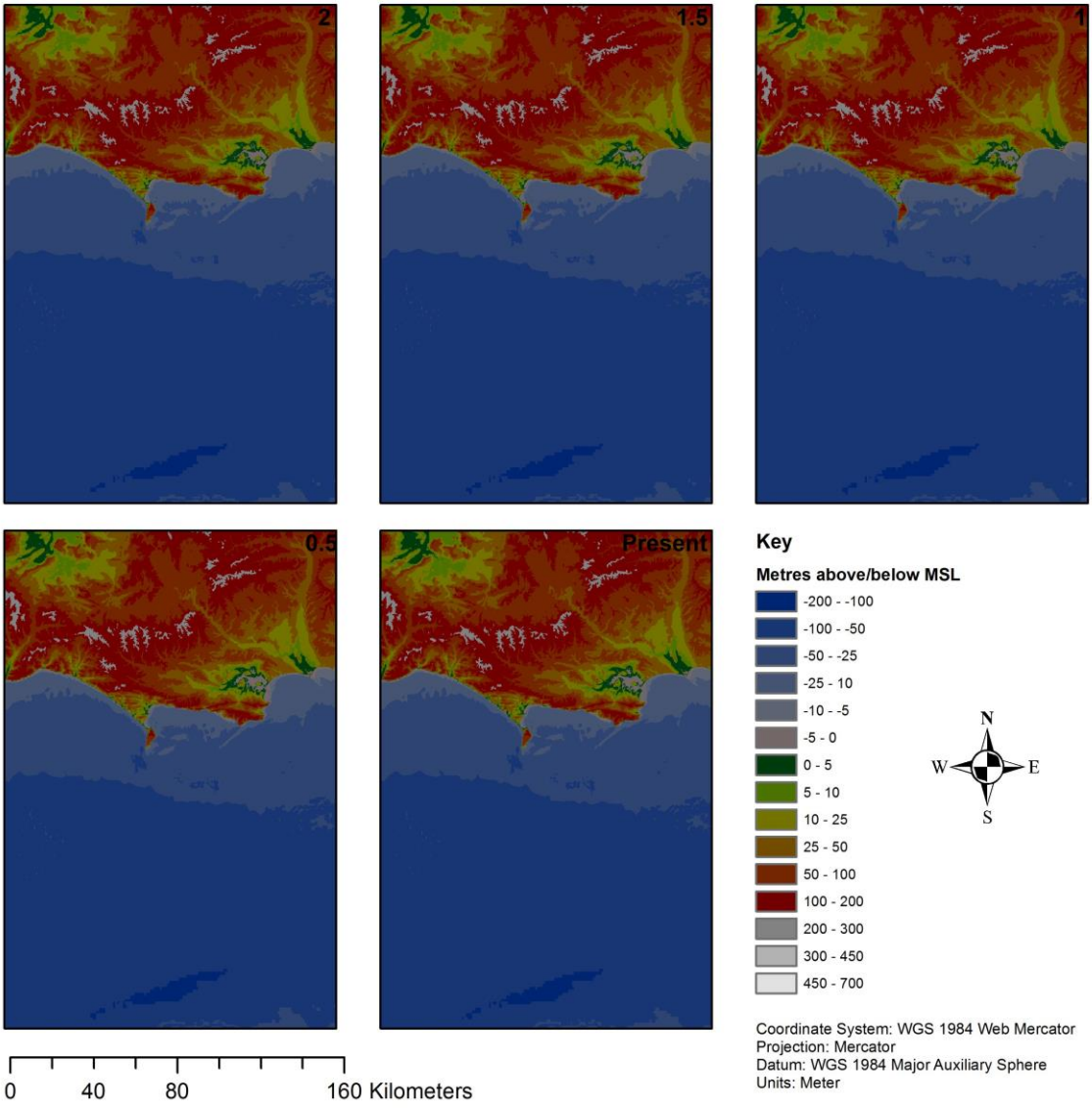

Fig 4.3 (Parts a, b and c) Palaeogeographic models of the Dorset coast from 11,000 BP to present by Fraser Sturt (University of Southampton). Map produced in part from Ordnance Survey Digimap, SeaZone solutions and GEBCO 08 (www.gebco.net) data. Crown Copyright/database right 2012. An Ordnance Survey/EDINA supplied service. Crown Copyright/SeaZone Solutions. All Rights Reserved. Licence No. 052006.001 31st July 2011. Not to be Used for Navigation. Additional data courtesy of the Channel Coastal Observatory.

5 Coastal and marine management

5.1 Management policy

5.1.1 UK Coastal and Marine Policy 1990s to 2009

Since the 1990s, EU and UK Governments have sought better understanding of coastal and marine environments and associated processes to provide the necessary information base for prospective strategic planning and long-term management of the coastal and marine environment.

From the late 1990s, European and UK legislation for the management of coastal and marine environmental resources has focused increasingly on an integrated spatial approach to marine planning. A series of reviews and reports dating from the Marine Stewardship Report '*Safeguarding our Seas*' (Defra 2002) indicated that a new approach to managing activities in the marine environment was needed. In particular, better integration and more effective spatial management of conflicting pressures were identified as prerequisites for conservation and sustainable development and have subsequently become crucial aspects of delivering the UK vision for the marine environment characterised by 'clean, healthy, safe, productive and biologically diverse oceans and seas' (UK Government 2009a).

5.1.2 The Marine and Coastal Access Act 2009

The Marine and Coastal Access Act was enacted on 12 November 2009 (UK Government 2009a). It provided for a new system of marine planning to fulfil the UK Government's marine objectives and priorities for the future, and directed decision-makers and users towards more efficient, sustainable use and protection of our marine resources. '*The Coalition: our programme for government*' was published in May 2010 and in it the present government confirmed that it would take forward the Marine and Coastal Access Act and make sure its conservation measures are implemented effectively.

The Act's key features were:

- Establishment of the Marine Management Organisation (MMO);
- Preparation of a Marine Policy Statement (MPS);
- Provision for a Marine Planning System;
- Provision for a streamlined marine licensing system;
- Designation of Marine Conservation Zones (MCZs);
- Provision of the coastal access duty.

The MMO started work on 1 April 2010, and is delivering UK marine policy objectives for England's inshore and offshore regions through a series of statutory Marine Plans and other measures. The Marine Policy Statement was published on 18 March 2011 (UK Government 2011) and is based on the High Level Marine Objectives for the marine planning system which were set by the UK Government (UK Government 2009b). In April 2011 the MMO embarked on a programme of Marine Plan preparation for the 11 Marine Plan Areas, to be completed in 2021.

5.1.3 The National Planning Policy Framework

The Department for Communities and Local Government published the National Planning Policy Framework (NPPF) in 2012, setting out Government planning policies for England and replacing the former Planning Policy Guidance (PPG) 16 and 20, and Planning Policy Statement 5 (PPS5) with immediate effect.

The NPPF is an important part of the government's reforms to make the planning system less complex and easier to understand. It sets out the Government's planning

policies for England and how they are expected to be applied (Department for Communities and Local Government 2012, section 1, paragraph 1).

The NPPF states that the purpose of the planning system is to contribute to the achievement of sustainable development which has three dimensions: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles; the environment role includes 'contributing to protecting and enhancing our natural, built and historic environment' (Department for Communities and Local Government 2012, section 1, paragraph 7).

The NPPF includes among its core principles the need to 'conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations' (Department for Communities and Local Government 2012, section 1, paragraph 17). 'Landscape' is included among the potential types of 'Heritage Asset' in the definition given in the NPPF Glossary (*ibid*, Annex 2).

Under the NPPF, local planning authorities should make information about the significance of the historic environment gathered as part of plan-making or development management publicly accessible. They should also require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted (Department for Communities and Local Government 2012, section 12, paragraph 141).

The NPPF states that local plans should also be consistent with the NPPF, including those aspects relating to the historic environment, and therefore should include strategic policies to deliver conservation and enhancement of the historic environment, including landscape (Department for Communities and Local Government 2012, section 13, paragraphs 156 and 157).

Plans should set out a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats. In doing so they should recognise that heritage assets are an irreplaceable resource and conserve them in a manner appropriate to their significance. They should take into account: the desirability of putting heritage assets to a viable use consistent with their conservation; the contribution conservation makes to wider sustainability aims; the desirability of new development contributing to local character; and opportunities to draw on the contribution made by the historic environment to the character of a place (Department for Communities and Local Government, 2012, section 12, paragraph 126).

Local plans should also be based on up-to-date evidence about the historic environment (Department for Communities and Local Government, 2012, section 13, paragraph 169). Local and neighbourhood plans should also develop robust and comprehensive policies that set out the quality of the development that will be expected for an area. Such policies should be based on stated objectives for the future of the area and an understanding and evaluation of its defining characteristics. Amongst other criteria, planning policies and decisions should aim to ensure that developments 'respond to local character and history, and reflect the identity of local surroundings and materials' (*ibid*, section 7, paragraph 58).

5.2 Coastal management

5.2.1 Coastal access

Delivery of the England Coast Path, under the Marine and Coastal Access Act 2009, is governed by a 'Coastal Access Scheme', approved by the Secretary of State. The Scheme is an important document as it sets out the methodology that Natural England

must use when carrying out its Coastal Access Duty. It contains the key principles on which their access proposals are based at the local level, and explains how these are applied in each of the main coastal scenarios.

The Act requires Natural England to review the Scheme within three years of its first approval. The first review of the Scheme was completed in March 2013 and the revised version, approved by the Secretary of State on 9 July 2013, is the one now followed by Natural England (Natural England 2013).

Already in place and foreshadowing many aspects of the Scheme's coastal access provision for the rest of England, the South West Coast Path, between Poole in Dorset and Minehead in Somerset, is 630 miles (1105km) long and by far the longest National Trail in England (Fig 5.1).

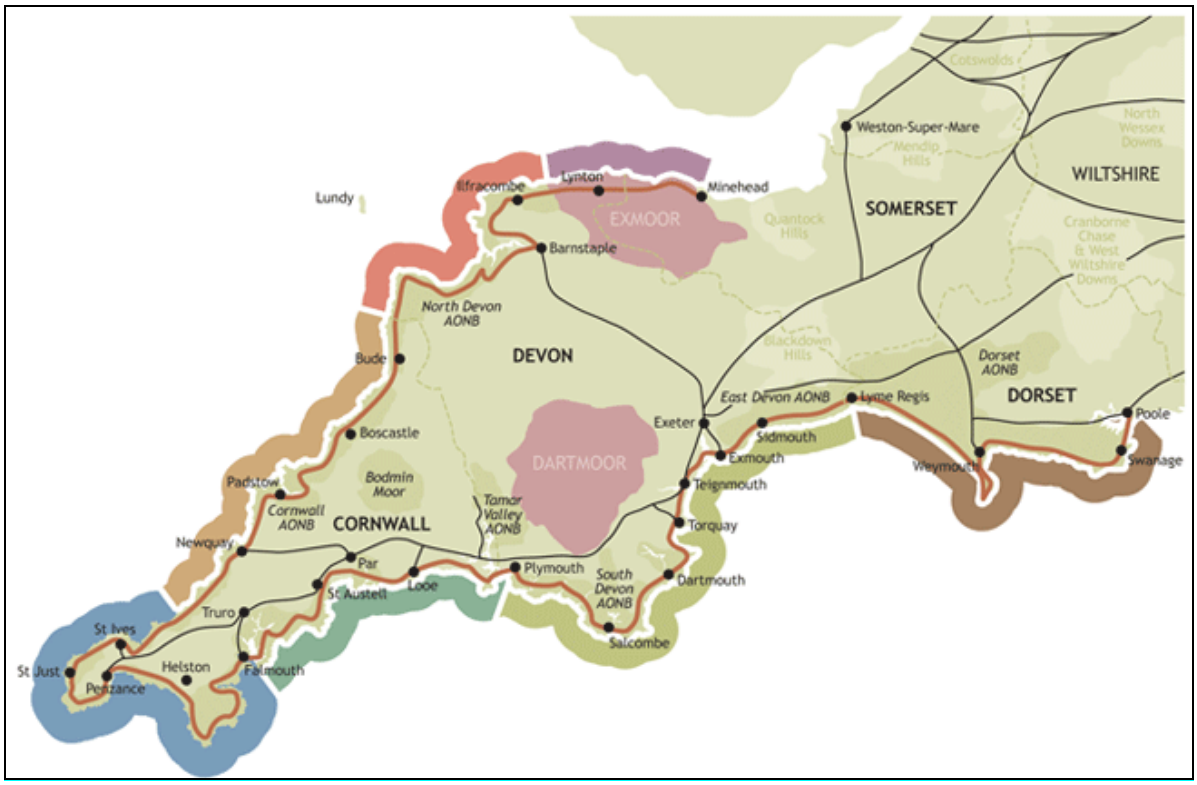

Fig 5.1 The South West Coast Path.

5.2.2 Coastal management frameworks

In addition to the Marine and Coastal Access Act 2009, a broad range of management frameworks exist for coastal, estuarine and inter-tidal areas, although they often limit themselves to near-shore areas when making assessments below Mean High Water. English Heritage and, in many cases, individual local authorities, are statutory consultees for initiatives towards the implementation and review of Integrated Coastal Zone Management (ICZM) and Shoreline Management Plans (SMPs), both designed to integrate long-term policy decision-making and strategic planning relating to the coastal zones. English Heritage's Rapid Coastal Zone Assessment Surveys (RCZAS) are being undertaken across all of England's coastal areas to enhance the coastal historic environment record and inform such initiatives.

Many of Europe's coastal zones face deterioration of their environmental, socio-economic and cultural resources. Integrated Coastal Zone Management is an approach promoted by the European Commission through the EU ICZM Recommendation (EU 2002) to bring together consideration and management strategies to address the many inter-related biological, physical and human problems presently facing these zones. The approach aims to promote a collaborative approach to planning and management of the coastal zone, within a philosophy of governance by partnership with civil society.

The principles of ICZM are integrated into the Marine and Coastal Access Act 2009 and the current UK Government sees ICZM as something that the implementation of the Act will in itself fulfil, in particular through marine planning.

https://www.gov.uk/government/policies/protecting-and-sustainably-using-the-marine-environment

5.2.3 The Marine Planning System

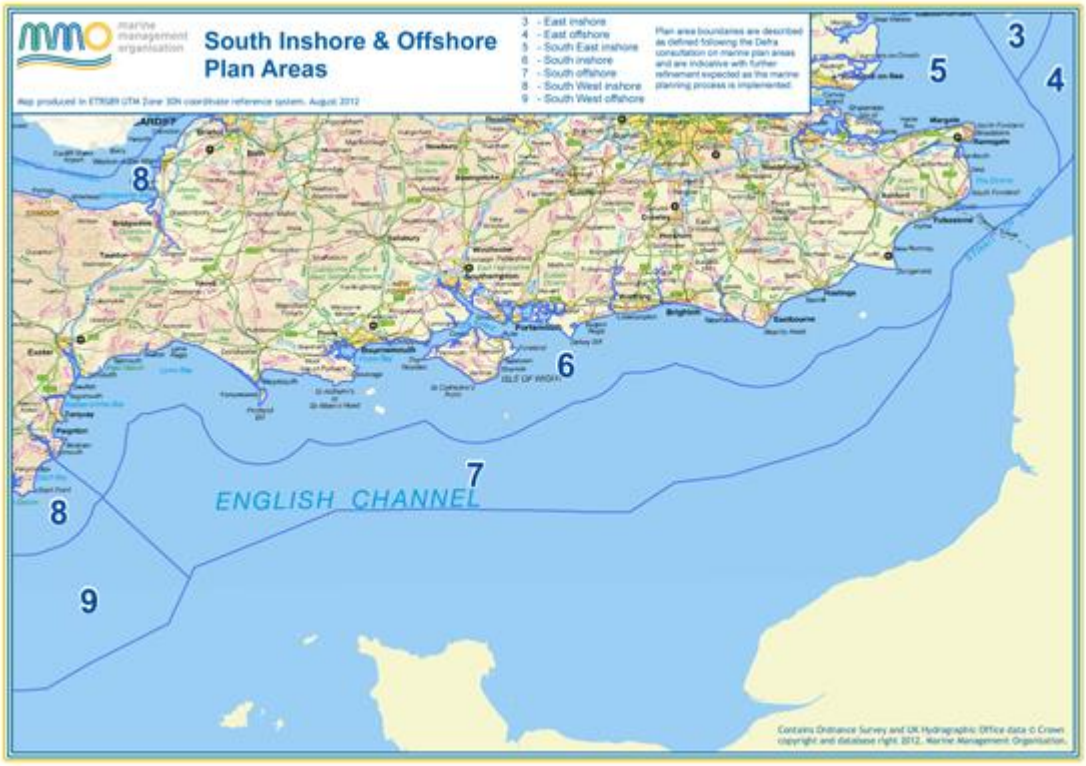

Fig 5.2 The South Inshore and Offshore Marine Plan Areas (Marine Management Organisation).

The Marine and Coastal Access Act 2009 Section 322 divided UK Controlled Waters into two marine regions: an inshore region (0-12 nautical miles) and an offshore region (12 – *c* 200 nautical miles) under each of the four Administrations (England, Northern Ireland, Scotland and Wales). In April 2011 the MMO embarked on a programme of Marine Plan preparation for the 11 Marine Plan Areas, to be completed by 2021, with Seascape Character Assessment (SCA) being used to inform those Marine Plans.

Marine Plans have relevance to a wide range of issues relating to human activities, their associated infrastructure, and their effects on resources, features and processes in the marine and coastal environment.

Preparation for the first Marine Plans, the East Inshore and East Offshore Areas, began on 1 April 2011. The second round of Marine Plans covers the South Inshore and Offshore Plan Areas (Fig 5.2), and their preparation commenced early in 2013. The area follows the coast broadly from Folkestone in Kent to Dartmouth in Devon; the inshore boundary terminates at the Mean High Water Mark, although the supporting seascape character assessment considers a wider coastal and terrestrial area of some 40km beyond this (MMO 2013, 1, fig 1).

5.2.4 Management of the historic environment in coastal zones

Advice on management of the historic environment in the coastal zone can be found in Defra policy and strategy documents and more specifically in the following English Heritage documents:

- Coastal Defence and the Historic Environment (English Heritage 2003);
- Ports: The impact of Development on the maritime historic environment (EH 2006a);
- Shoreline Management Plan Review and the Historic Environment (EH 2006b).

This advice stresses the need for consultation with English Heritage and the HERs/SMRs of relevant local authorities regarding management of the historic environment and on the implications of specific developments or other actions. It is vital that regional and local advice is taken and that all heritage assets are considered, not just designated monuments, buildings and areas. It is likely that new English Heritage policy will move away from an automatic onus on preservation *in situ* to one of adaptation, where, following regional and local advice, archaeological mitigation will focus on those areas, features, monuments or buildings considered to be most important.

Although coastal management has moved on since 2006 and the detail of these documents is out of date, the principles underpinning EH's approaches are still as set out in these guidance documents. Revised guidance has been drafted by Peter Murphy and this is now being edited before being issued (Vince Holyoak, pers comm).

5.2.5 Shoreline Management Plans

A Shoreline Management Plan (SMP) provides a large-scale assessment of the risks associated with coastal evolution and presents a policy framework to address these risks to people and the developed, historic and natural environment in a sustainable manner. In doing so, a SMP is a high-level document that forms an important part of the Defra strategy for flood and coastal defence (Defra 2001).

Each SMP covers an area of coastline known as a sub-cell within a littoral sediment cell. A sediment cell is defined as a length of coastline, which is relatively self-contained as far as the movement of sand or shingle is concerned, and where interruption to such movement should not have a significant effect on adjacent sediment cells.

There are two SMPs which cover the three sub-cells of the Dorset Coast: the Poole and Christchurch Bays SMP from Durlston Head to Hurst Spit, and the South Devon and Dorset SMP from Durlston Head to Rame Bay.

The first SMP (SMP 1) for Poole and Christchurch Bays was completed in 1999 and worked from west to east along the coast. Since that time, more detailed strategy studies have been undertaken over large sections of the coastline and these, together with academic research and monitoring by the responsible authorities, have improved understanding of how the coast behaves and of management issues. Defra (2001; 2003) undertook a review of the results from SMP1, considering their strengths and weaknesses, which led to revised guidance and the SMP2 programme. The SMP2 review for Poole and Christchurch Bays was undertaken between 2007 and 2011 (Royal Haskoning 2011).

The frontage for the Poole and Christchurch Bays SMP is divided into four policy zones: PDZ1 —Central and Eastern Sections of Christchurch Bay; PDZ2 — Christchurch Harbour and Central Poole Bay; PDZ3 — Poole Harbour and Associated Coastline; PDZ4 — Swanage. Within each PDZ the coast was further sub-divided into a series of 'Management Areas' (MAs). Within each of these, management policies were selected for a series of 'Policy Units' (PUs).

The first SMPs for Portland Bill to Durlston Head and Portland Bill to Rame Head (Lyme Bay and South Devon) were both adopted in 1998. The SMP2 review for Durlston Head to Rame Head was produced by the Halcrow Group for the South Devon and Dorset Coastal Advisory Group (SDADCAG) in 2011.

The Durlston Head to Rame Head SMP2 is divided into 15 Policy Scenarios Areas (PSAs). Five of these are relevant to the Dorset RCZAS: PSA1 Durlston Head to White Nothe; PSA2 White Nothe to Redcliff Point; PSA3 Redcliff Point to Portland Bill; PSA4

Portland Bill to Thorncombe Beacon; and PSA4 Thorncombe Beacon to Beer Head. The PSAs are sub-divided into many smaller policy units.

The defences proposed by the SMPs for various parts of the Dorset coastline vary significantly; the policy options considered are set out in Table 5.1. The three periods of time in which a Shoreline Management Plan is reviewed are known as 'Epochs'. The first epoch is 0–20 years, the second epoch is 20–50 years and the third epoch is 50–100 years.

SMP Policy	Abbreviation	Definition
Hold the line	HTL	Maintain or upgrade the level of protection provided by defences or the natural coastline
No active intervention	NAI	A decision not to invest in providing or maintaining defences or management of the coast
Managed realignment	MR	Manage the coastal processes to realign the 'natural' coastline configuration, either seaward or landward of its present position.
Advance the line	ATL	A decision to build new defences seaward of the existing defence line where significant land reclamation is considered

Table 5.1 SMP policy abbreviation definition (from Royal Haskoning 2011).

6 Previous archaeological and historical research

6.1 PDZ2 Christchurch Harbour and Central Poole Bay

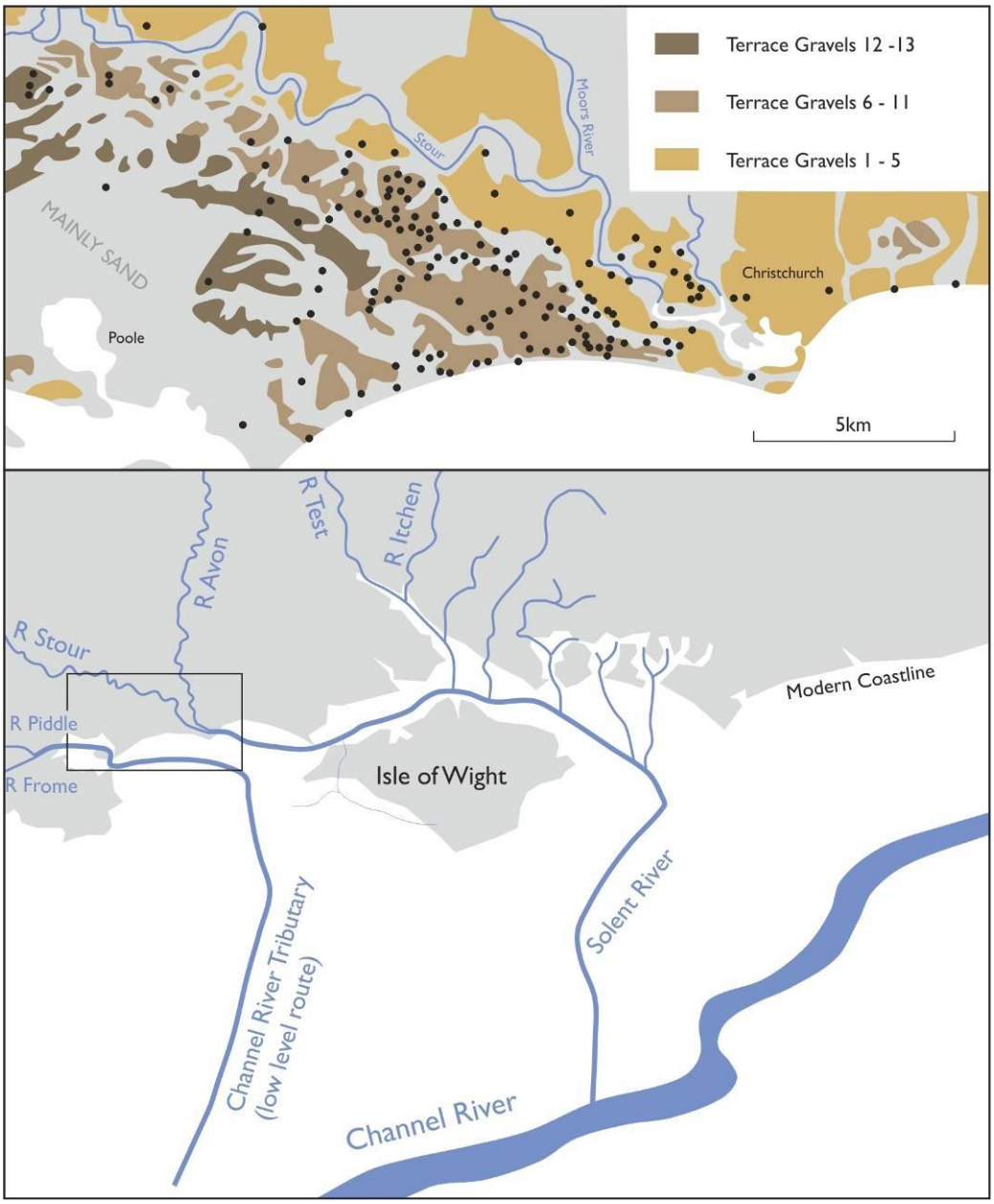

Fig 6.1 Top: Lower and Middle Palaeolithic findspots associated with the terrace deposits of the Avon, Stour and Solent Rivers, in the Bournemouth region. Bottom: reconstruction of the Solent River and its tributaries, representing an 'eastern' and 'western' Solent River (from Hosfield et al 2008 and after Bridgland 1996, fig 3.8, and Wymer 1999, map 23).

Archaeological research in this area has been dominated by Hengistbury Head, the prominent headland protecting Christchurch Harbour. The site has yielded significant evidence of occupation from the Lower and Middle Palaeolithic, the Late Upper Palaeolithic and the Early Mesolithic, when it may have been as much as 20km inland from the contemporary coastline (Mace 1959; Barton 1992). In the Iron Age, when its topography and siting made it an ideal port-of-trade, the headland was easily recognisable from a distance out to sea and two major rivers, the Stour and the Avon, flowed into the large natural harbour, allowing easy access into the heart of densely populated Wessex (Cunliffe 2001, 403).

6.1.1 Prehistoric and Roman period

Lower and Middle Palaeolithic

There has been a series of relatively rich Lower and Middle Palaeolithic findspots on the modern Dorset coast, all associated with the fluvial deposits of the Stour (such as the Railway Ballast Pit at Corfe Mullen, which has produced nearly 200 handaxes) and the Solent Rivers (Fig 6.1; Hosfield *et al* 2008, 33). In the Bournemouth region, where the gravels of the two rivers meet, at least 50 handaxes and occasional Levallois flakes were found at Moordown, Kings Park, Queens Park and Winton, and other locations (*ibid*, 33). Wymer (1999 106–11) suggests that all of this material dates between OIS 11 (i.e. post-Anglian) and OIS 8. The majority of the Bournemouth finds were casual discoveries, related to building developments and drainage work, although some of the larger findspots were related to aggregates extraction activity. The age of this material, and that of the Bournemouth region's terraces in general, remain uncertain, although continued applications of OSL dating to the Solent terrace deposits (Briant *et al* 2006) should help to resolve the problem. In the interim, detailed models have been suggested by Allen and Gibbard (1993), Bridgland (1996) and Westaway *et al* (2006). For the purposes of this assessment the simple division proposed by the British Geological Survey (Bristow *et al* 1991) for the Bournemouth terraces is adopted.

- Terraces 11–14: Older Terrace Gravels to the south and east of the Proto-Solent, higher than those which can be related to the present-day drainage system.
- Terraces 9–10: Terrace Gravels dating to the time of the establishment of the Rivers Avon and Stour.
- Terraces 1–8: Terrace Gravels related to the present day River Avon.

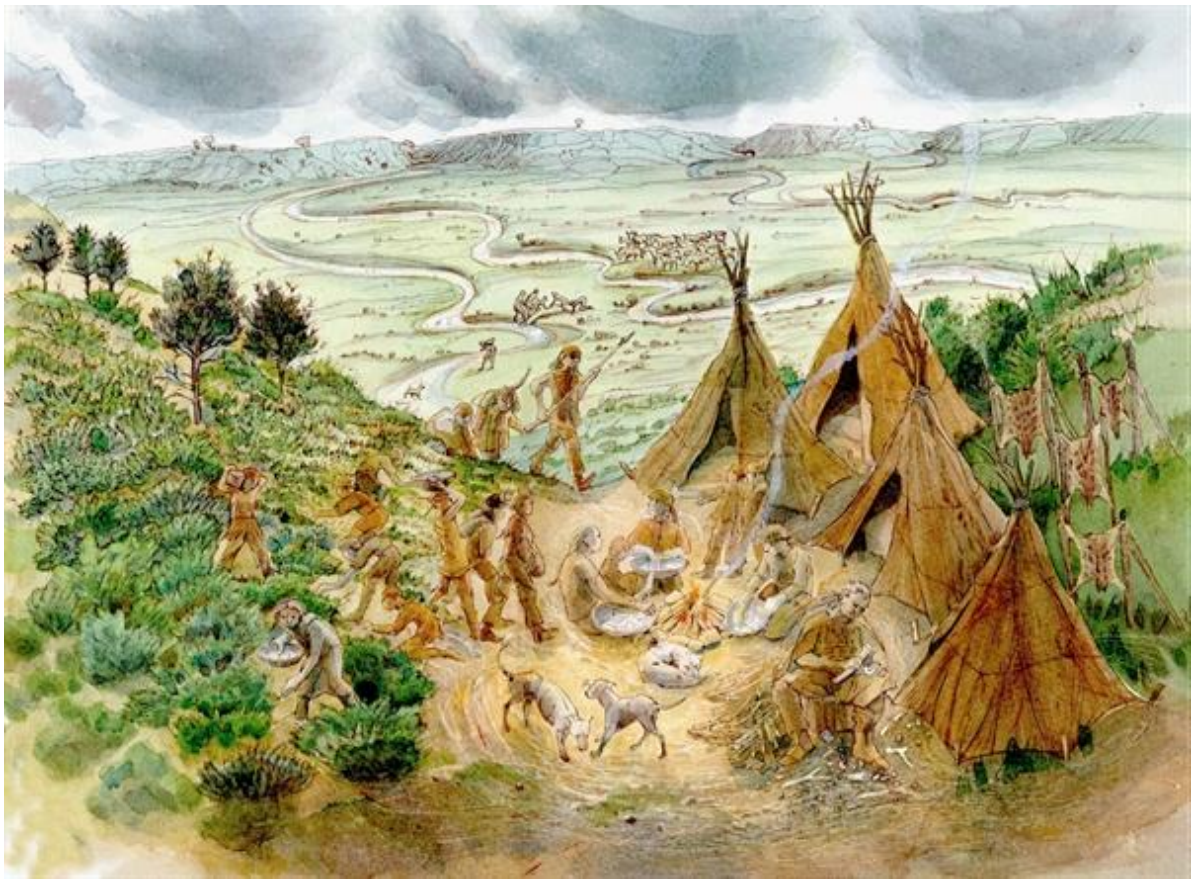

Fig 6.2 An artist's reconstruction of Upper Palaeolithic occupation on Hengistbury Head (© Hengistbury Head: Explore-Learn-Discover).

At the estuary of the combined Avon and Stour there are also Levallois flakes, cores and *bout coupé* handaxes associated with low-level terraces. The terrace sequence and age is controversial, but the material alone seems to be a clear indicator of a Middle Palaeolithic occupation (Wymer 1999, 106–7, 110). To the west of Bournemouth, the terrace deposits of the Frome and the Piddle have been commercially exposed and extracted, revealing a relatively rich handaxe assemblage at Moreton, and suggesting an occupation in the upper reaches of the Solent. Unfortunately, the terrace deposits in the upstream reaches of the Frome and Piddle are poorly preserved and the age of all of these terraces is again uncertain (Wymer 1999, 107–8, 110; Hosfield *et al* 2008, 33).

Late Upper Palaeolithic

The Late Upper Palaeolithic site at Hengistbury Head (Fig 6.2) is one of the key sites in the south of England and a notable exception to the cave sites which dominate this period. It has been interpreted as a well sheltered and concealed residential hunting location, with excellent views over the flat landscapes extending to the south. The site has yielded a major Late Upper Palaeolithic assemblage, characterised by straight-backed blades, bladelets and large tanged points, which differs from Britain's Creswellian assemblages (Barton 1992, 273; 1997, 124) but mirrors other open sites such as Brockhill and Long Island in Langstone Harbour in southern England and Dreuil-les Amiens in the Paris Basin (Fargnat 1984). The Paris Basin sites lie directly across Channel, an area that would have been mostly dry during the last glacial oscillation and for thousands of years thereafter (Barton 1999).

Thermoluminescence dating to 12500 BP ±1150 years, together with lithic evidence, has indicated that there is only a single Late Upper Palaeolithic occupation at Hengistbury Head. The lithic materials have provided evidence for the spatial separation of activities such as the primary production of tool blanks (in a peripheral zone away from the hearths), for knapping and blade production sequences, and for raw material procurement and use (Barton 1992, 273; Hosfield *et al* 2008, 40).

The site has also produced one of the few examples of Late Upper Palaeolithic art in Britain, in the form of a refitted flint core with abstract engravings on the cortex (this has parallels with identically incised flints on contemporary sites in the Netherlands and France). Red ochre has been found in association with end scrapers and other tools, perhaps reflecting the use of ochre in hide-working activities (Hosfield *et al* 2008, 37).

It is notable, however, that away from this site there are only five single findspots of Upper Palaeolithic blade technology, all located around Bournemouth, including a Grossklinge blade core from Queen's Park Avenue (Hosfield *et al* 2008, 40).

Mesolithic

The beginning of the Holocene saw the introduction of small Mesolithic tools and blades that soon replaced the Upper Palaeolithic technologies. There is evidence that Mesolithic peoples made use of the resources along the Dorset coastline at sites including Powell on Hengistbury Head and Culver Well on Portland Bill (Palmer 1990). These sites date to a period when the sea level was not much lower than today but the contemporary coastline would have been much further offshore.

Hengistbury Head has provided rich evidence of Early Mesolithic activities. The average thermoluminescence age of 9750 ±950 BP indicates an occupation in the Boreal or pre-Boreal (Barton 1992). Although the majority of the raw materials (both flint and non-flint) are probably of local origin, there is evidence for the use of sandstone originating from the South West. In general the narrow range of tool types (microliths, end-scrapers and microdenticulates) has been seen as suggesting a specialised activity site at Hengistbury, probably associated with game hunting (partly based on the presence of similar tool-kits at other upland locations in the region). The presence of large numbers of proximal microburins has been interpreted by Barton (1992, 274) as evidence that the site was a primary tool production zone.

Palmer (1972) excavated a Mesolithic assemblage from a site at Crouch Hill on Christchurch Harbour and noted evidence for a scatter of coastal sites of this period in the Bournemouth and Christchurch area.

Neolithic and Early Bronze Age

Gardiner (1987b) reviewed the evidence for the distribution of Neolithic and Early Bronze Age activity in the wider region around Hengistbury Head and Christchurch Harbour and it is clear from this, building on earlier work by Calkin (1951), that it represents a very significant concentration of occupation during the third and second millennia BC (*cf* Barrett *et al* 1991, figs 2.5, 3.5, 4.3). The wider coastal zone is also known for monuments such as the Holdenhurst long barrow (Piggott 1937) and pit finds of Early Neolithic material at, for example, Southbourne and Hadden Hill, in Bournemouth (Wilson 1980). This concentration has led Field (2011, 17) to suggest that it is valid to view the Christchurch area, with its river links into the chalk landscapes to the north, as the principal focus for human activity within the notional archaeological region of 'Wessex', rather than the ceremonial complexes such as Stonehenge and Avebury.

Gardiner (1987a) assessed material from Hengistbury Head and the nearby site on Christchurch Harbour at Crouch Hill, including that from various surface collections and excavations carried out there by Bushe-Fox in 1911-12 and St George Gray in 1918-24, as well as the excavations carried out by Cunliffe in the 1970-80s (Cunliffe 1987). She identifies an important assemblage of Neolithic flintwork and finds of Grooved Ware pottery, with Late Neolithic activity apparently spread over most of the headland; more Grooved Ware has been found nearby at Crouch Hill, also on Christchurch Harbour. She noted the Gray Collection from Hengistbury Head as 'one of the most varied and fine collections of Late Neolithic flintwork from Southern England' (*ibid,* 25). The Head has also produced some Bronze Age flintwork, worked stone and pottery, and a distinctive form of early bronze flat axe of a type commonly found in Breton and Norman burials of the eighteenth and seventeenth centuries BC (Gardiner 1987a, *passim;* Needham 1978).

A group of at least 13 Early Bronze Age barrows survives at Hengistbury Head, and there are also indications of some flat graves; it has been proposed that 'during the first half of the second millennium bc most, if not all of the headland was given over to use as a cemetery' (Gardiner 1987a, 47). The results from various excavations of barrows on Hengistbury Head are summarised in her report (*ibid,* 47-60). Bowen (1972) suggested that the barrows were used as markers for sea navigation.

Middle – Late Bronze Age

Middle Bronze Age funerary practices in Dorset are characterised by the well-known barrow and flat cemeteries associated with Deverel-Rimbury pottery where urned and unurned cremation burials, often in large numbers, were frequently made to the south and east of barrows, many of which date to the Early Bronze Age. Well-known sites include Knighton Heath, Latch Farm and Simons Ground, located near Poole and Christchurch harbours (Piggott 1938; Calkin 1962; White 1982). Gardiner (1987b) points out that the presence of so much evidence for burial in the area 'surely indicates that the coastal plain was extensively occupied at this time'. Evidence of agricultural activity of the period, however, comes from interpretation of possible field ditches pre-dating the Deverel-Rimbury cemetery at Pokesdown, to the west of Hengistbury Head (Gardiner 1987b, 335; Yates 2007, 60).

Iron Age

Early Iron Age occupation, including a roundhouse settlement, is recorded at Hengistbury Head (Cunliffe 1987), together with evidence of cultivation prior to the Later Iron Age and Roman-period activity on the site (Lewis 2002). Cunliffe (1987, figs 214, 215, 231) indicates a concentration of Earliest and Early Iron Age occupation around the wider Christchurch Harbour area. Several mainly Late Iron Age settlements

are also known in the hinterland of Poole and Christchurch Harbours (Calkin 1965; Jarvis 1984).

The site at Hengistbury Head is essentially a defended settlement of the type known as a promontory fort, the defences of which may pre-date the Late Iron Age activity. By the Later Iron Age it was an important port-of-trade (Wilkes 2013) and was characterised by quasi-urban settlement behind its defensive dykes in a manner which invites comparison with the oppida of southern Britain; it may in fact have been the earliest of such sites. These Late Iron Age defended sites are often seen as having urban characteristics, with the evidence that they provide for industrial activity, trade and exchange being emphasised (Fitzpatrick *et al* 2008, 137). Cunliffe has suggested that a mint for Durotrigian coins may also have been located on Hengistbury Head in the Late Pre-Roman Iron Age (Cunliffe 1987, 346). To what extent hillforts such as Maiden Castle, Hod Hill and Hambledon Hill were superseded by such trade-focused centres is a matter for debate. Sherratt (1996) has argued that for central Wessex, as in earlier prehistory, the link to Continental trade routes provided by the Avon, Stour and Christchurch Harbour were crucial in underpinning the economic and cultural development of the region.

Extensive evidence for cross-Channel exchange has been found at Hengistbury, principally in the form of Armorican pottery and coins, Roman wine amphorae, and raw glass. There is also a smaller amount of evidence for exchange with communities across the South West, primarily in the form of the metals of copper, tin and lead. Glass, shale objects and salt were produced on the site (Cunliffe 1987). While the evidence for trade is clear it has been questioned whether the site was a permanent settlement or was used as a seasonal enclave by Gaulish traders (Fitzpatrick 2001). From the late first century BC activity seems to have moved from Hengistbury to nearby Poole Harbour (Cox and Hearne 1991; Cunliffe and de Jersey 1997, 108; Markey *et al* 2002).

Increased activity around Poole and Christchurch Harbours in the Later Iron Age may indicate the use of coastal wetlands for seasonal cattle pasture (Cunliffe 1987; Cox and Hearne 1991; Fitzpatrick *et al* 2008, 133). The reasons for what appears to be an expansion into previously marginal areas in this period are not clear but they may hint at a widespread population increase and possibly the development of specialised, industrial or farming communities or the increased exploitation of resources such as salt and shale (Cox and Hearne 1991; Hathaway 2010) or localised marine incursions.

Roman period

Hengistbury Head undoubtedly declined as a trading centre in the era prior to the Roman Conquest, although there was no significant break in occupation (Cunliffe 1987, 345-6). Occupation of some status, evidenced by coin finds, Gallo-Belgic pottery and Samian ware, continued until at least the mid second century AD, with occupation subsequently equivalent to that of a 'peasant homestead'; much of the headland appears to have been given over to mixed agricultural use during the Roman period (*ibid*).

Parts of a 'burnt and mud-buried Roman ship' were reported to have been found in Christchurch Harbour in 1910 (English Heritage 2012b, 4).

6.1.2 Early medieval and medieval periods

Rectilinear field systems

The development of rectilinear strip territories, field systems and settlement pattern around Christchurch is discussed by Davey (2013). Between the river valley marshes and the unenclosed heaths and forests of the Christchurch region was a narrow strip of cultivable land historically occupied by dispersed settlement and organised into the tithings of Christchurch Hundred. An eighteenth-century tithing map provides a rare and accurate depiction of land division in the region prior to late-nineteenth-century

parliamentary enclosure and depicts rectilinear field alignments arranged into tithings running perpendicular to the rivers Avon and Stour. Unfortunately, there is no further independent dating evidence for this field system but the fact that tithing boundaries follow the same alignments suggests that they may be medieval or earlier in origin and morphologically could be considered to be of late prehistoric origin; the proximity of Hengistbury Head perhaps provides an economic context for pre-Roman land division in the region (Davey 2013, 185–7).

Christchurch

Some early Saxon activity is evident in the Christchurch area, with, for example, a substantial number of warrior burials in the area (Jarvis and Horsey 1977, 345). Christchurch itself was founded in the seventh century AD on the banks of Christchurch Harbour where the rivers Avon and Stour meet. During 1970-1982 Christchurch became one of the 'most extensively examined Dorset Burhs' when Poole Museum Archaeological Unit conducted various excavations in the town, establishing a chronology of its development in the medieval period (Jarvis 1983; Jarvis and Horsey 1977). The development of the late Saxon settlement has recently been reviewed by Haslam (2009).

Antiquarian excavations were carried out at Christchurch Priory in 1776 and some possible medieval stone coffins were found, along with a collection of bird bones which have yet to be satisfactory explained (Jarvis 1983, 16). An excavation in 1969–70 revealed a garderobe and located the precinct wall (Wilson and Hurst 1969, 244, 246). A limited excavation and watching brief in 1985 investigated the foundations for a link building between the priory and the eighteenth-century priory house (Jarvis 1985). The Wessex Archaeological Committee carried out seven excavations between 1981 and 1983 which examined parts of the town defences and the sixth century Saxon cemetery and provided further dating and structural evidence for the occupation and defence of the town (Davies 1983). Norton (1980) has analysed the medieval floor tiles from Christchurch Priory) and there has been recent work by The Christchurch Antiquarians to locate the site of the medieval 'borough', 'town' or 'Port' mill (Tizzard 2013).

Christchurch was the subject of a comprehensive characterisation study (Bellamy and Davey 2011b) as part of the Dorset Historic Towns project.

6.1.3 Post-medieval period

Bournemouth and central Poole Bay

This area was predominantly deserted heathland until the early nineteenth century; a late sixteenth century document referred to the area then known as Bournemouth as 'voyd of all inhabiting' (Mate and Riddle 1910, 6). In the later sixteenth century there were efforts to exploit alum and copperas at Durley Cliffs, Alum Chine and Boscombe (*ibid,* 8–10; Allen *et a*l 2001), part of the wider efforts to develop these industries in east Dorset at this period (Bellamy *et al*, forthcoming a; forthcoming b; forthcoming c).

In 1810–11 a local landowner built a seaside mansion at Bournemouth and promoted the area as a 'watering place' (Mate and Riddle 1910, 1-2), with rapid subsequent development of villas and suburban housing across heathland formerly used only for turbary and grazing (*ibid*, 33). By the years immediately before World War I the 'County Borough of Bournemouth' had achieved a population of 75-80,000 and included an 'area of nearly six thousand acres, with six miles of sea frontage, and upwards of six hundred acres of Parks, Pleasure Grounds, and open spaces secured for all time against the attacks of the speculative builder or any others who would destroy the special characteristics of the 'Town in a Pine Forest' — the 'Forest City by the Southern Sea' ' (*ibid*, 2). The same authors also described it as the 'Pleasure City of Detached Mansions' (*ibid*, 53).

Bournemouth has not yet been subject to characterisation as part of the Dorset Historic Towns project (www.dorsetforyou.com/390076) but aspects of its development as a

resort have been assessed by (among others) Edwards (1998), Edwards (2010), Marsh and May (2010), Emery (2008) and Gadd (2002).

Mudeford and Highcliffe, east of Christchurch, began to develop as seaside settlements rather earlier than the Bournemouth area, again on land which had predominantly been coastal heath. In the 1770s Lord Bute constructed a house named High Cliff on a site with spectacular views over Christchurch Bay, later used for the recently restored Gothic mansion Highcliffe Castle (Listed Grade I), built 1831-34 by Lord Stuart de Rothesay, partly using materials imported from demolished French medieval buildings (NHLE 1110077). Mudeford already had three bathing machines when George III visited, en route to Weymouth, in 1803 (Mate and Riddle 1910, 29).

6.2 PDZ3 Poole Harbour and associated coastline

A collection of studies on Poole Harbour has recently been published (Dyer and Darvill 2010), covering a wide range of themes and periods and offering a recent bibliography in addition to the various individual contributions.

6.2.1 Prehistoric and Roman period

Palaeolithic

A substantial concentration of Acheulian tools from *c* 130,000 BC has been recovered from Corfe Mullen, to the north of Poole Harbour, and there have been other finds of comparable Palaeolithic material from around the Harbour (Darvill 2010, 58).

Mesolithic

The only current evidence for activity around Poole Harbour in the earlier Mesolithic is from Bestwall Quarry, near Wareham, where a flint scatter probably represents a working area of about 9000 BC (Ladle 2010, 63; Darvill 2010). For the later Mesolithic there are flint scatters known from various locations in the wider area, including sites on the south-west side of the Harbour identified during the Wytch Farm oilfield investigations (Healy 1991; Cox and Hearne 1991, 225).

Neolithic and Early Bronze Age

The Wytch Farm oilfield investigations during the late 1980s found relatively little evidence of Neolithic activity, with the exception of a flint scatter of the Later Neolithic just outside the current project area on New Mills Heath, inland from Middlebere (Cox and Hearne 1991, 46, 225). There is a loose scatter of Early Bronze Age barrows on the heathlands south of Poole Harbour (*ibid*, fig 3) and deposits possibly deriving from funerary activity were identified on a site on the east side of the Corfe River where traces of an Early or Middle Bronze Age field system were also investigated (*ibid*, 27-46).

Ashbee (1954) investigated a round barrow on Canford Heath, on the eastern side of Poole Harbour and further Bronze Age funerary activity has been investigated in the same area at Knighton Heath (Petersen 1981).

Middle – Late Bronze Age

A number of the Middle Bronze Age features and finds at Bestwall Quarry, near Wareham, are of exceptional significance. Excavation revealed evidence for a well-ordered landscape consisting of field boundaries, houses, burial areas and pits. Features and artefacts indicate small self-sufficient communities supplementing their agrarian lifestyle with some pottery production, as well as periodic communal activities. In 2001 an outstandingly well-preserved complex of Middle Bronze Age features was excavated comprising a house, burnt mound and pits, all associated with a large assemblage of Deverel-Rimbury pottery and two copper alloy bracelets. These finds were interpreted as a 'closing' deposit' marking the abandonment of the house and the burnt mound which succeeded it (Ladle 2003; 2004; 2012; Ladle and Woodward 2003; Ladle and Woodward, 2007).

Comprehensive multi-period excavations were also carried out at Wytch Farm Oilfield from the late 1970s to the 1990s (Cox and Hearne 1991). There was limited evidence for Mesolithic to Early Bronze Age occupation, but in the Middle Bronze Age a linear field system was established with possible associated settlement east of Corfe River and on Furzey Island. Yates (2007, 60-64) has drawn attention to a range of evidence for Middle Bronze Age field systems in this area and more widely along the Dorset coast.

Iron Age and Roman period

Iron Age settlements and field systems are recorded on the heathlands around Poole Harbour, including partially excavated sites at Worgret (Hearne and Smith 1992) and several sites on the Wytch Farm oilfield (Cox and Hearne 1991). How many of the well-preserved Celtic field systems that are often thought to date to the Iron Age originated in the Middle Bronze Age is unknown (Fitzpatrick *et al* 2008, 120).

Settlement and other sites of this period are also known on the islands in Poole Harbour (Calkin 1948; Cox 1988; Jarvis 1992; Wilkes 2010a; 2010b). Projects in this area suggest a possibly continuous system of prehistoric enclosures on Furzey Island, the Ower Peninsula and Green Island. Archaeological investigations on Furzey Island have revealed prehistoric settlement and production sites (Cox 1988). On the Ower Peninsula there are indications of a planned Late Iron Age coastal settlement with pottery and salt production, shale and metal working (Woodward 1987; Cox and Hearne 1991). Sporadic excavations on Green Island have recovered Iron Age pottery and evidence of shale working and iron smelting (Farrar 1963; 1964; 1967; Bromby 1969).

As with Christchurch Harbour, there is evidence for the use of Poole Harbour for maritime trade during the Iron Age. It is thought to have contained a major Iron Age port: the mole-like Green Island causeway at Cleavel Point suggests that quays or harbour works of some form were being built at this early date (Wilkes 2010a). A substantial 10m-long log boat, radiocarbon dated to 397–176 cal BC and now in Poole Museum, was found east of Brownsea Island in 1964 (Markey *et al* 2002).

Excavations in Hamworthy have shown that the area was occupied from the Late Iron Age, with imported amphora and other pottery dating between 100 and 50 BC, followed by a Roman settlement from the first to the fourth century (Jarvis 1994; Jarvis and Bellamy 2010). Hamworthy is thought to have been a supply port for Vespasian's 2nd Legion and a Roman road is known to have connected Badbury Rings to the Hamworthy peninsula via the Roman fort at Lake, near Wimborne. It has been suggested that this road linked to a port facility in Hamworthy but the terminus of the road is not known. It may have ended at the south shore of Hamworthy, but this would have been far from deep water at the time and an unlikely location for waterside facilities. A second hypothesis suggests that the road ended on the north side of the current port where a deep-water basin was shown on early maps and charts (Smith 1933). This is where the Roman port is thought to have been located although no physical evidence has yet been found (Jarvis and Bellamy 2010, 72).

6.2.2 Early medieval and medieval periods

Early antiquarian investigation in Wareham was chiefly concerned with the possible Roman origins of the town (Farrar 1954; Bellamy and Davey 2011d), but work by RCHME in the early 1950s established that the town was possibly constructed after *c* AD 700 (RCHME 1959). During the 1970s a series of excavations in the town revealed, among other discoveries, the location of the castle's outer defensive ditch and the first archaeological evidence for late Saxon structures at St Martin's House on North Street (Hinton and Hodges 1977; Hinton and Horsey 1978). From the late 1980s Lilian Ladle conducted several watching briefs and investigations on behalf of the Wareham and District Archaeology and Local History Society (Bellamy and Davey 2011d). In 1994, an excavation by Wessex Archaeology revealed two phases of medieval activity of twelfth to thirteenth century date in the town (Harding *et al* 1995). The historic

development and topography of the town has been reviewed by Bellamy and David (2011d).

The failed planned medieval settlement at Newton has been studied by Bowen and Taylor (1964), as part of the Dorset Historic Towns project (Le Pard and Bellamy 2011) and briefly by Bromby (2010).

The Norman church of St Nicholas, Studland, has been described and analysed by Lundgren and Thurlby (1999), who concluded that the architecture is essentially Norman, without the pre-Conquest elements which have been ascribed to it.

The antiquarian John Hutchins recorded his observations on the archaeology of Poole (Hutchins 1774). Surveys were undertaken in the town by the RCHME (1970) during the final stage of their county inventory survey. Excavations by Poole Museum between 1973 and 1983 provided a sequence for the development of the town and waterfront from the thirteenth century onwards (Horsey 1981; 1992). The town has the only archaeologically investigated medieval boatbuilding site in the country (Hutchinson 1997, 24).

The origins of the port should be seen in the context of the silting of the higher western reaches of the harbour and the consequent decline of Wareham (RCHME 1970, 189; Horsey 1981, 146). A number of recent archaeological reports have addressed the development of the port. Wessex Archaeology (2004c) conducted an archaeological assessment and geophysical survey as part of a channel deepening scheme within the harbour. MAST (2011) conducted a desk based assessment on the Ro-Ro 1 marina. The main focus of this investigation was the collection of hulks of WWII landing craft used in 1950 to make a breakwater; this study gave possible identifications and time-lines for the hulks. Bournemouth University (2014) carried out an EIA in association with the larger development for the port which, other than the Ro-Ro hulk collection, found no archaeologically significant sites within its study area. However, these surveys included sub-bottom profiling and core analysis which provided a theoretical peat map of channel and areas around the port.

6.2.3 Post-medieval and modern periods

The historic town of Poole and its buildings were described in a RCHME report (1970, 189-240) and the town's trade in the first half of the seventeenth century has been assessed by Stephens (1974). Poole has not yet been subject to characterisation as part of the Dorset Historic Towns project (www.dorsetforyou.com/390076)

In 2009 archaeological investigations carried out by the Dorset Alum and Copperas Industries project examined the series of undated earthworks known as the Studland Circles on the South Haven peninsula. A total of 112 earthwork circles were recorded on Studland Heath and Greenlands Farm. Geophysical and earthwork survey was undertaken on a sample study area on Studland Heath and a single earthwork circle was examined in detail, through excavation and geoarchaeological analyses. This earthwork was shown to consist of a simple bank built of turf and sand which had been stripped from the interior. No evidence for any activity was recovered from the interior to suggest its function. It was constructed on a layer of windblown sand, possibly related to post-medieval sand dune development. No evidence was recovered for the function of the earthwork circles but an industrial or agricultural function is most probable (Bellamy *et al,* forthcoming b).

In 2009–10, archaeological investigations by the Dorset Alum and Copperas Industries project identified a possible seventeenth-century copperas works on the south shore of Brownsea Island. The remains of a rectangular brick-lined 'tank' and brick surface exposed by coastal erosion were excavated and 15 test pits dug in the surrounding area to locate associated features. Both structures were constructed of late eighteenth or early nineteenth century bricks. The bricks in the tank appear to be reused and include specialised gutter bricks. A series of earthworks, a large clay pit and a sand pit were recorded. Historic maps suggest that all these features formed part of a late

eighteenth- and early nineteenth-century brickworks, rather than part of the seventeenth-century copperas works (Bellamy *et al,* forthcoming a).

A unique feature of the south shore of Brownsea sland is the huge quantity of pottery shards spread across the foreshore. These are the last remnants of a Victorian enterprise to mine clay and establish a tile and pottery industry. In 1852, Colonel Waugh purchased the island and commenced an ambitious building project to establish a pottery works and a small village (Maryland) for the workers. Unfortunately, the clay quality was lower that estimated and by 1887 the enterprise had failed and the pottery closed (Flux 2012, 4).

A documentary study of the later historic economic exploitation of the coastal Purbeck heathland was carried out by the Wytch Farm Project (Cox and Hearne 1991, 14–25). Minor quays and other coastal features around Poole Harbour have been investigated by Le Pard (2003; 2010b) and Jarvis (2014).

As part of the national assessment of hulk assemblies Holes Bay was singled out as one of the largest hulk assemblages in England with 22 hulks dating from the 1950s; this study also noted several small hulks in Lytchett Bay, beyond those recorded in the HER from 2009 APs (Davies 2011). The report recommended further research into the assemblage. Bournemouth University used this area as a training ground between 2006 and 2009 and noted several hulks which could prove interesting to maritime history and the development of local craft.

The World War Two (WWII) coastal defences at Studland Bay and their significance have been described by Foot (2006, 64–72). The defence area consists principally of the coastline of Studland Bay north of the village of Studland. Studland Bay was one of the two stretches of Dorset coastline where German invasion was considered most likely, the other being Lyme Bay, targeted by the German 6th Army under the Operation Sea Lion plans. The defence area played an important role in WWII and all aspects of that role are represented by the surviving material evidence: anti-invasion defence, petroleum warfare experiments and assault training. The identified defences include 11 pillboxes, five gun emplacements, anti-tank cubes, four minefields, two areas of beach scaffolding, an anti-tank obstacle, two roadblocks, an observation bunker (Fort Henry), a slit trench, two petroleum warfare sites, four defence works, an Allan Williams turret, a machine gun post and a fire trench.

A study of the WWII defences of Poole Harbour was conducted as part of a dissertation at Bournemouth University (Mockeridge, 2008).

6.3 PDZ4 Swanage (Handfast Point to Durlston Head)

This section includes the eastern part of the Isle of Purbeck, a topographically discrete area which provided a range of 'minerals' which were important to human populations throughout the prehistoric and historic periods.

6.3.1 Prehistoric and Roman periods

Iron Age and Roman periods

A large number of Iron Age and Romano-British settlements are known to have been exploiting the mineral resources of the Isle of Purbeck and Poole Harbour on an industrial scale; many of these sites are coastal and lie within the RCZAS study area (Sunter and Woodward 1987, 6, fig 1). Research and synthesis in conjunction with fieldwork has provided a great deal of information on many specific aspects of Purbeck's settlement and industry, most importantly the shale armlet industry (Calkin 1953), the Purbeck Marble industry (Beavis 1970), salt-winning (Farrar 1975; Hathaway 2010) and the production of Black-burnished pottery (BB1) (Farrar 1977; Williams 1977). These studies have emphasised the unique position that Purbeck and its hinterland around Poole Harbour held in southern Britain. By the Late Iron Age shale, salt and pottery was being traded out of Purbeck, inland and along the coast.

Poole Harbour provided shelter for shipping and sites in the harbour such as Ower, Hamworthy and Green Island have been identified as being part of a trading network which was centred on Hengistbury, to the east (see above, section 6.1), and concerned with trade links inland, with northern France and as far as the Mediterranean (Cunliffe 1980; *cf* Sunter and Woodward 1987, 6).

During the Roman period the mineral resources of Purbeck were increasingly exploited and exported, including its fine stone for building materials and architectural ornament. The BB1 pottery trade grew rapidly at an early stage, probably as a result of new military and civilian markets induced by the Roman Conquest. The production of BB1 pottery was quickly expanded, together with other items such as marble mortars; shale tables, trays and ornaments; limestone roof tiles; stone tesserae; and marble veneers. The mechanisms of the developing industries are not as yet clearly understood but aspects have been discussed in a number of papers, notably Iron Age trading patterns (Cunliffe 1982), the military contact and induced trade (Greene 1979), and the internal trading status of Purbeck sites (Woodward 1980).

6.3.2 Swanage

There has been a relatively small amount of archaeological investigation in the town of Swanage, which has produced only a small body of archaeological evidence (Bellamy 2011, 21). A DBA and field evaluation by Wessex Archaeology of land adjacent to Bell Street revealed evidence for prehistoric, Roman and later features (Smith 1996, 136). A DBA of Durlston Country Park identified 185 sites with an additional 145 sites identified during a walkover survey, many of them associated with George Burt who built Durlston Castle in 1887. Other sites were attributed to the quarrying in the area which occurred from the Iron Age to the late nineteenth century (Norcott 2004).

Swanage has been the subject of a comprehensive historic urban characterisation study (Bellamy 2011).

In the wider area around Swanage investigations at Ulwell have revealed evidence of Mesolithic occupation (Calkin 1952) and of a Saxon inhumation cemetery (Cox 1989).

6.4 PSA1 Durlston Head to White Nothe

6.4.1 Prehistoric and Roman periods

Palaeolithic and Mesolithic periods

Mesolithic material has come from inland at Corfe Castle (Davey 2011b) and Mesolithic and Neolithic lithic material is said to be among surface finds from the Worth Matravers area (www.squareandcompasspub.co.uk/index.php/fossil-museum).

Neolithic and Bronze Age

Earthwork monuments and reported finds from this period were recorded in the RCHME (1970) volumes for south-east Dorset.

Pollard *et al* (2008, 87) noted that Kimmeridge shale from the Isle of Purbeck was worked and exchanged in moderate quantities from the Neolithic onwards, as in the case of shale beads in the secondary infill of the West Kennet long barrow (Piggott 1962), Wiltshire, and the Eyford and Notgrove long cairns in Gloucestershire (Clarke *et al* 1985, 233–5, figs 2.9, 7.2, 7.3). It became more significant in the 2nd millennium BC, when it was used to replicate personal ornaments otherwise made in jet (Pollard *et al* 1981) and also to make exceptional, highly crafted objects, such as the handled cup from a barrow at Farway Broad Down (Clarke *et al* 1985, 282, fig 4.46), and the gold-inlaid macehead from the Clandon barrow (Clarke *et al* 1985, 274–5, fig 5.49). There is evidence for the working of shale from Kimmeridge sources at the Middle Bronze Age settlements at Gwithian in Cornwall and Brean Down, Somerset, both sites with extensive coastal connections (Nowakowski *et al* 2007, 36; Pollard *et al* 2008, 87).

Late Bronze Age activity (*c* 800-600 BC) in the area is evidenced by a large hoard of socketed axes recovered from a site behind the coast at Langton Matravers: although outside the present study area the find spot had views to Swanage Bay, and from nearby, even wider views across the sea to the east and to the Isle of Wight. Similar hoards have come from other sites close to the coast at Portland and near Weymouth (Roberts 2007).

Iron Age and Roman period

A number of later prehistoric settlements have been excavated on the Isle of Purbeck. That at Eldon's Seat lies close to the coast and has a long occupation sequence from the Middle Bronze Age to the Early Iron Age (Cunliffe and Phillipson 1968); Wheeler (1953) excavated what was interpreted as an Earlier Iron Age hillfort or hill-top enclosure at Bindon Hill, Lulworth.

A roundhouse settlement with probably continuous occupation from the Early Iron Age into the first century AD and extensive evidence for shale-working was excavated on the cliff edge at Rope Lake Hole, Kimmeridge (Woodward 1987). It was succeeded in the second and third centuries AD by at least one rectangular structure and there was again substantial evidence for the production of shale items, particularly arm rings (*ibid*). Quantities of briquetage from the site also indicate salt production in the near vicinity across these periods. Fieldwalking in the area has indicated two further Early-Middle Iron Age occupation sites a short distance to the west (Woodward 1987) and the Middle Bronze – Early Iron Age site nearby to the east also provided evidence for shale-working (Cunliffe and Phillipson 1968).

Briquetage from the Kimmeridge area reported by Calkin (1948) is comparable to forms and fabrics recovered from Iron Age layers at Danebury hillfort, Hampshire, and Maiden Castle, Dorchester (Poole 1984; 1991).

Other Later Iron Age settlements include Compact Farm, Worth Matravers (Graham *et al* 2002), and Manor Farm, Portesham (Valentin 2003). A circular vertical pit or shaft at least 3m deep with several courses of dry stone walling and the remains of a corbelled roof were found adjacent to a 'Celtic' field system and Roman-period occupation on the west side of St Aldhelm's Head, Worth Matravers (Beavis *et al* 1982). It was interpreted as a probable storage pit of Iron Age date, comparable with corbelled structures only previously known from the Isle of Portland.

There are extensive 'Celtic' field systems within the area, potentially originating during the Bronze Age, including a large complex immediately behind coastal cliffs west of Durdle Door around Scratchy Bottom, Vicarage Bottom and Middle Bottom (RCHME 1970; Keen and Carreck 1987; Stanier 2004, 64). Overall, there appears to have been significant occupation of land behind the coastal cliffs in this region in the later prehistoric and Roman periods.

The upper portion of a Pascual 1 Roman amphora from Catalonia was recovered from the seabed at St Alban's Head Ledge in 1994 (Parham and Fitzpatrick 2013), offering further evidence of the trading links of Dorset coastal sites in the late prehistoric period. Several other Pascual 1 amphorae have been found on the Dorset coast at Hengistbury Head, Hamworthy and Weymouth Bay and have been dated to the British Iron Age (pre-AD 43) on typological and contextual grounds (*ibid*).

6.4.2 Medieval and medieval periods

The striking pattern of 'strip-parishes' and land divisions running inland from the southern coast of the Isle of Purbeck was addressed by Taylor (1970). He gave examples of a number of constituent Saxon estates (Fig 6.3) and pointed out that 'almost the whole of the pre-Norman landscape is recoverable' (Taylor 1970, 59-61, fig 7). He also proposed that the basic pattern of settlement and land units represented is likely to have been 'Romano-British or Celtic rather than Saxon in origin' (*ibid,* 72-3),

although recent studies suggest that that such rectilinear field systems have been developing episodically since the Bronze Age (Davey 2013).

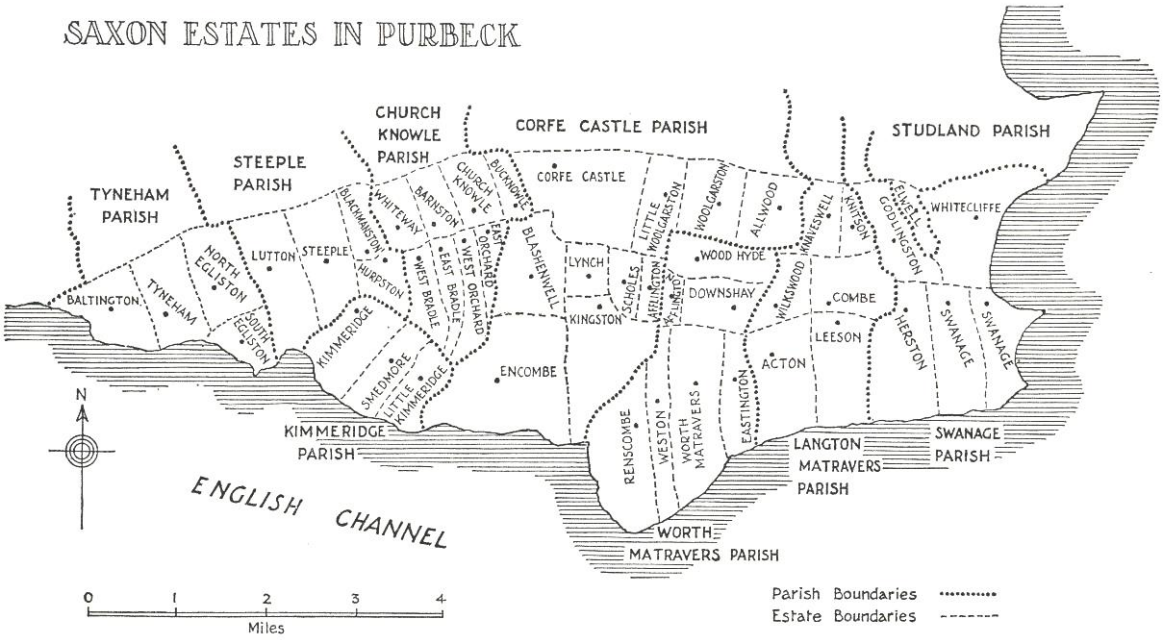

Fig 6.3 Saxon estates in Purbeck (after Taylor 1970).

The RCHME south-east Dorset survey (1970) recorded a number of deserted medieval settlements in this area, and published a large-scale plan of the medieval and other earthworks at Tyneham. Maw (1981) located a 'lost' medieval and post-medieval settlement site behind the coast near Rope Lake Hole, Kimmeridge, with associated fields (Woodward 1987). The latter are described as terraced but it was unclear from the excavation whether these were a system of strip fields or simply lynchetted former boundaries (*ibid*). The strip lynchets at Worth Matravers were reported on by McOmish (2002) and, for the eighteenth century, by Hinton and Trapp (2002).

Small tithe payments on fish are recorded during the medieval period from Tyneham, West Tyneham, Renscombe, Ower, Church Knowle and Kimmeridge, indicating the probable existence close to the shore of small-scale facilities for storing and repairing nets and gear and processing catches (Hinton 2002b, 95; *cf* Fox 2001).

6.4.3 Post-medieval and modern periods

In 2009–10, archaeological investigations were carried out by the Dorset Alum and Copperas Industries project in Kimmeridge Bay (Bellamy *et al,* forthcoming b). There is documentary evidence for alum production at Kimmeridge in 1569 by John Clavell and in the period 1605-1617 by William Clavell, but the precise location of their works is not known. Earthwork survey revealed the remains of three linked ponds with associated dams and sluices, industrial deposits, and a number of stone and timber structures along the shoreline. The ponds were most likely constructed as part of the early seventeenth-century alum works. Examination of eroding industrial deposits along the shoreline (at SY 9088 7880) revealed an extensive layer of burnt shale and shale ash that may have derived from the earliest alum works. This was sealed by clay and stone structures that may have formed part of a former quay or jetty perhaps also related to William Clavell's industrial ventures. This was buried beneath tips of burnt shale waste, probably relating to nineteenth-century activity. Exploratory excavations and geophysical survey were undertaken, centred on SY 9103 7878, where brick-built furnaces had been previously discovered, but the archaeological remains were not extensive. Part of two flues and associated firing pits were found, probably related to

the previously discovered furnaces, but they appeared unused. No dating evidence was recovered and no definite link to alum production was found.

Glass-making was also carried on at Kimmeridge in the early seventeenth century, and the remains of a glass furnace established by Sir William Clavell have been excavated on a site close to the shore (Crossley 1987).

Pomeroy (1995) includes a useful gazetteer of coastal WWII sites. At Worth Matravers the last of the aerial towers of the former radar research site was demolished in 1960 but one building survived in 1995 (*ibid,* 115–6).

The twentieth-century history of the Tyneham estate, including post-WWII debates on its future use and management, has been examined by Dudley (2012, ch 5).

6.5 PSA2 White Nothe to Redcliff Point

This section is only 6km long and the coastline is very dynamic. Relatively little is known of the coastal archaeology because the cliff is unstable and a large part of the study area is slump and tumble on the coastal slope. This is the location of the noted site of Burning Cliff, near which, in 1813, the cottage and garden of a farmer called Bagg slid intact down the cliff; the building materials were said to have been recovered ten years later to build another cottage (*Gentleman's Magazine* 1823, 395–8). At Osmington Mills there are traces of a number of quays or slipways with associated winches and storage sheds, formerly associated with a small coastal fishery (Payne 1953, 59); these have been destroyed or put out of use by recent slumping of the cliff (G Kirkham, field visit April 2014) (Fig 6.4).

Fig 6.4 A slipway at Osmington, partly covered by coastal collapse (Photograph: Graeme Kirkham).

Notable sites in this area are the medieval fishpond (NHLE 1016724) and deserted medieval settlement (NHLE 1019393) at West Ringstead, both of which are potentially at medium to long-term risk from coastal erosion. There are extensive areas of strip lynchets near Osmington Mills. Upton Fort, parts of which are Listed and is a new Scheduled Monument (NHLE 1021435), was an early twentieth century and World War II coastal artillery battery with two searchlight emplacements. There are remains nearby of a substantial World War II radar complex, including array bases and the earthworks which sheltered monitoring facilities.

6.6 PSA3 Redcliff Point to Portland Bill

Palaeolithic and Mesolithic

A significant assemblage of later Palaeolithic material was recovered from excavations in 2002 at the Youth Hostel at Castletown, on the northern end of the Isle of Portland (Palmer 2003). Finds of this period have previously been made on the island, predominantly in otherwise Mesolithic assemblages (Palmer 1967; 1998).

6.6.1 Mesolithic

The important Mesolithic site at Culver Well on the Isle of Portland (Palmer 1990; 1999) provides an indication of Early Holocene coastal activity. The 300m^2 shell midden indicates the exploitation of a wide range of marine molluscs, although fish bones are notably absent. It is possible that the shellfish resource at this site was overexploited, suggesting intensive and persistent use (Mannino and Thomas 2011). Shell midden material and hearth charcoal have yielded radiocarbon dates of 5700–6350 cal BC (BM-473; 7150 ±135) and 6210–5750 cal BC (BM-960; 7101 ±97). The site includes several hearths, a possible cooking pit and a possible floor of limestone slabs.

Portland was the source for Portland chert, widely used for lithics across southern England during the Mesolithic period and into the Neolithic (Palmer 1970; Care 1979; 1982). Stone picks found on the Isle may have been used for removing limpets from rocks but an alternative hypothesis is that they were utilised in the process of quarrying chert from outcrops (Palmer 1970; Mithen 1999, 49).

Neolithic and Bronze Age

Earthwork monuments and finds from this period were recorded in the RCHME (1970) volumes for south-east Dorset. Worked flint and chert material of probable Neolithic date has been recovered on Portland (Palmer 1968, 202-3).

6.6.2 Later prehistoric and Roman period

In 2006, an archaeological evaluation of land off Augusta Road, Portland, revealed a single Iron Age pit thought to be associated with a small cluster of Iron Age pits, a possible grave and a group of postholes found nearby during sewer diversion work (Tatler and Bellamy 2006). The pottery from pit is dated to the Early Iron Age and is comparable with that from other nearby sites and from Rope Lake Hole and Eldon's Seat. This site lies to the north and west of previous archaeological discoveries. Romano-British remains were found during extension work to Broadcroft quarry in 1950 and 1951 (Farrar 1950, 1951) and more recently part of an extensive Iron Age and Romano-British settlement, cemetery and industrial site was discovered during further extension work to the quarry (Laidlaw and Martin 2004).

Salt production at Wyke Regis is dated to the first century BC on the basis of briquetage (Farrar 1963).

In the mid nineteenth century Roman remains were found 'on top of a small hill, in the parish of Preston . . . a situation of great beauty, commanding the whole Bay of Weymouth, with the Island of Portland in the distance' (Harford 1844, 5–7). The finds from the site on Jordan Hill included approximately 300 coins, plus quantities of animal bone and, pottery. In an oval pit 3–4 ft in diameter and 6ft below the surface, were

'layers of flat stones, between each of which was a single Roman coin, and a quantity of bones of birds and mice'. Putnam (2007, 121–3) has synthesised the evidence from the antiquarian and other investigations at what was evidently a Roman-period temple, cemetery and deposition site. The wide sea views and striking view to Portland from the site, situated atop the coastal slope, may have been significant elements in the choice of location.

The location of the Roman-period port in the Weymouth area is not known with certainty. Putnam (2007, 143) provides a brief review of the evidence, suggesting a location on the Backwater.

6.6.3 Early medieval and medieval periods

The first recorded Norse raid on mainland Britain appears to have taken place in Dorset, probably in Weymouth Bay, in AD 787 or 789 (Wessex Archaeology 2007, 27). Three ships from Hordaland were involved. The Anglo-Saxon Chronicle records that the king's reeve from Dorchester, *Beaduheard,* was killed when he attempted to collect customs dues, presumably mistaking the raiders for peaceful merchants (Swanton 1996, 55). The raiders were eventually driven off.

Little is known of early medieval settlement in the Weymouth area, but continuing use of the area as a maritime focus may be implied by the 'Viking' mass grave recently discovered inland at Ridgway Hill (Loe *et al* 2014; Loe and Boyle 2014).

Ports at the mouth of the River Wey, Weymouth and the neighbouring Melcombe Regis, are first mentioned in 1100, when they were granted to the convent and Prior of St Swithin of Winchester. Subsequently a local charter mentions the port at Weymouth in 1252 (Wessex Archaeology 2007, 29).

In 1280 and 1318 respectively Melcombe Regis and Weymouth were granted borough status. This strongly suggests that they had become important as trading ports. Trade will have been with the Continent and other English ports, with the principal export being wool and imports including grain and wine. In 1324 Weymouth supplied four ships for the king's service ranging from 120 to 200 tons and Melcombe two ships of 110 and 120 tons (Williamson 1998 57). These tonnages indicate that these were substantial vessels suited to long distance open water trading. By 1347 Weymouth was sufficiently rich to supply 15 ships and 263 seamen for the siege of Calais. At the same time Melcombe was a customs port.

Melcombe Regis is famous for being the port where bubonic plague, the 'Black Death', first arrived in England in 1348. Although Melcombe was made a staple port for wool in 1364, it seems that neither port made a full recovery. Melcombe and presumably Weymouth suffered from the general insecurity of the French wars. Portland was attacked by the French in 1340 (Rodger 1997, 100). Weymouth may have fared better at this time. Evidence from medieval port books indicates that there was still a substantial trade with the Continent. In 1487-8 for example, 29 trading vessels arrived from Brittany and four from Normandy, in addition to two from the Channel Islands, nine from local ports and 16 from other English ports (Williamson 1998, 108).

A medieval fishing industry based on Portland is implied by the payment of a substantial tithe on fish catches (Hinton 2002b, 95), although nothing is known of features associated with fishing at this period.

6.6.4 Post-medieval and modern periods

Weymouth's development from the medieval period and its history as a seaside resort are discussed by Brodie *et al* in '*Weymouth's Seaside Heritage*' (2008), one of the books in English Heritage's '*Informed Conservation*' series, and mentioned more briefly in '*England's Seaside Resorts*' (Brodie and Winter 2007). It has also been the subject of a historic urban characterisation report as part of the Dorset Historic Towns project (Bellamy *et al* 2011).

Since the 1800s the harbour at Weymouth has been altered by various reclamation schemes that have increased its size at the seaward end. The harbour has also been extensively dredged, principally to ensure its continued use by recreational boats (Wessex Archaeology 2007, 31).

The east side of Portland has always offered a natural anchorage and this acquired much greater strategic significance in the mid nineteenth century with the expansion of the French naval base at Cherbourg. In addition to Verne Citadel, huge enclosing breakwaters were built between 1854 and 1894, together with a naval dockyard. At the time it was the largest and most expensive civil engineering project in Europe. The improved shelter meant that the harbour became an increasingly popular anchorage, particularly for the Channel Fleet. Debris from the construction and later use of the breakwaters can be expected to be present on the seabed in their immediate vicinity.

In 1539/401 Henry VIII constructed Portland Castle and Sandsfoot Castle to accommodate artillery to defend the Portland. These were two of a number of artillery forts built to defend harbours and anchorages during the wars against France in the 1540s. Although Portland Castle was strengthened during the late sixteenth century because of the threat from Spain, it never saw serious action beyond skirmishes during the Civil War (Robertson 1992, 30). Sandsfoot Castle was repaired in 1584 due to damage suffered by coastal erosion and undermining by the sea and was held for the King in the Civil War until 1644/5 when it was surrendered to Parliamentary forces. Brett (2013) has re-examined the history of the Tudor fortifications intended to defend Portland Roads.

By the mid-1800s the role of defending the anchorage had been taken over by Verne Citadel, a large Palmerstonian fort, one of a chain again built to ward off the threat of French attack. Covering a massive 56 acres and situated in a more elevated and therefore commanding position, the fort was armed with rifled 38-ton guns with a maximum range of 10 miles (Robertson 1992, 30).

During the medieval and post-medieval periods, Portland had an extensive open field system. The tithe survey recorded 2,678 individual strips, known as 'lawns' (Bettey 1970, 33) (Fig 6.5). Some areas of the lawns and associated lawnsheds or lynchets survive (RCHME 1970, figures 2–3; Dorset County Council 2011), including two Scheduled blocks towards the southern end of Portland (NHLE 1002729) (Fig 6.5).

Fig 6.5 Lawns and lawnsheds on the Isle of Portland (Photograph: Ben Williamson).

A survey of industrial archaeology on the Isle of Portland was carried out in 2006–7 (Stanier and Cox 2007). This had the two principal objectives of incorporating information (location/date/extent) about past, present and future quarrying of Portland stone and the production of aggregate on to the county Sites and Monuments Record (SMR, now the HER), and enhancing and validating the SMR record for aggregate producing areas. About 400 sites belonging to the industrial period (*c* 1750 onwards) were identified, mostly from map sources and the SMR (see below, section 8.7). Those most relevant to the stone industry included quarries, tramways, railways, stone saw mills and masonry works, limekilns, stone-loading quays and cranes. Other industrial sites included lighthouses, navigation aids, coastguard stations, waterworks, gasworks, blacksmiths' shops, a foundry ad numerous boundary stones. The Convict Prison and churches and chapels also fall within this period. The prison is directly related to quarrying as are numerous Victorian and twentieth century defensive military works around the island (Stanier and Cox 2007, 3). The report includes a gazetteer of sites and useful lists of historic maps and published sources (*ibid*, appendices 2, 3 and 4).

6.7 PSA4 Portland Bill to Thorncombe Beacon

6.7.1 Prehistoric

Palaeolithic to Mesolithic

Deposits of peat are relatively common on Chesil Beach, particularly in the Abbotsbury and West Bexington section. Other deposits on Chesil Beach have been dated to 6100 ±120 BP, the Late Mesolithic / Early Neolithic period (Le Pard 2001).

The region to the west of Portland Bill has been significant for Mesolithic archaeology with large numbers of artefacts recovered from the Fleet behind Chesil Beach (Palmer 1990, 87; Hosfield *et al* 2008, 58).

Neolithic and Bronze Age

Tilley (2010, ch 5) has incorporated Chesil Beach and Portland into a wider interpretation of Mesolithic and Neolithic cosmologies and monument construction in this area of Dorset.

Maritime activity in later prehistory is hinted at by the recovery of an Armorican bronze axe from the sea bed off Chesil Beach (Taylor 1980; Needham *et al* 2013).

Iron Age and Roman period

The distinctive Late Iron Age 'Durotrigian' burials occur mainly in the south of Dorset. The dead were often buried in a crouched position in shallow, oval graves, usually on lying on their right hand side, with the head towards the east (Wheeler 1943; Aitken and Aitken 1991; Mckinley 1999). Joints of meat, and pottery, are the most common grave goods but almost half of the burials do not have grave goods (Whimster 1981, 37–59, figs 22–3; Woodward 1993, 216–19). There is currently little evidence that this rite appeared before mid-first century BC (Fitzpatrick *et al* 2008, 143).

A few burials include objects (swords or mirrors) that are found in other regional burial rites in England and are suggestive of a particular status. Across Britain, burials with swords that are certainly of Iron Age date are only found with inhumation burials. Burials with mirrors include Portesham, although this burial probably occurred shortly after the Roman conquest (Fitzpatrick 1996). Bronze mirror handles were also recovered from two cist burials at The Verne, Portland and an earth grave at West Bay, Bridport (Whimster 1981, II, 258, 253).

There is another good example of 'strip-parishes' and land divisions running inland from the southern coast at Abbotsbury / Portesham (Barker 1988, 37-8; Costen 2007, 67-71; Morris 2002, 88; Davey 2011a, 25-6; 2013), comparable with those discussed above on the Isle of Purbeck (section 4.4). Recent studies suggest that such rectilinear field systems have been developing episodically since the Bronze Age (Davey 2013).

Early medieval and medieval

The earthworks of the shrunken medieval settlement and church at West Bexington have been described by Bailey (1984). In this area medieval settlement appears to have been typically located up to 1km inland from the shore; these were not 'fishing villages' but rather agricultural villages from which some fishing may have been carried out (*cf* Fox 2001). 'Cellar settlements', providing facilities associated with fishing – salt and net stores, for example - may have existed where routes from these villages came to shoreline landing places but permanent settlement in these locations appears to be for the most part post medieval. West Bay, the medieval landing place for Bridport, is probably an exception and purchases of oysters, whelks and fish by Bridport's chantry priests in the fifteenth century indicate an established local fishing industry at this period (Hinton 2002b, 95).

Bridport itself has been suggested as a possible Saxon *burh,* although the current topography is that of a T-shaped medieval settlement with extensive burgage plots (Williams 2006, 7-8; Bellamy 2008). These were used from an early date for rope-making. A useful booklet by Celia Martin (2003) covers the Bridport rope and net-making industry from the first documentary reference to the Dorset hemp and flax industry in 1211 to the present day.

6.7.2 Post-medieval and modern periods

Post-medieval

The buildings of the flax and hemp industry in Bridport and West Bay and the significance and future of Bridport's industrial heritage are discussed by Mike Williams (2006), in one of the books in English Heritage's '*Informed Conservation*' series. The town was the subject of a study undertaken as part of the Dorset Historic Towns Project (Bellamy 2008).

The Abbotsbury duck decoy has been reported on by Prendergast (1984) and attempts to drain parts of the Fleet by Le Pard (2000; 2002; 2010a, 114-8).

Modern

Fig 6.6 A World War II pillbox on the eroding shore of Chesil Beach west of Abbotsbury. A second pillbox is visible in the middle ground (Photograph: CAU).

The WWII coastal defences at Abbotsbury and their significance have been described by Foot (2006, 57–63). The defence area consists of the Abbotsbury coastal frontage west of the point where the West Fleet lagoon behind Chesil beach ends, together with the hills beyond the beach and the village of Abbotsbury itself. Under plans for Operation Sea Lion, the Dorset coast from Weymouth to Lyme Regis, including the Abbotsbury area, was to be a secondary area of attack by the German 6th Army consequent upon the success of the main landings on the Kent and Sussex coasts. The defences included 22 pillboxes (Fig 9.1), anti-tank cubes (including those making up a massive anti-tank barrier crossing Chesil Beach), four gun emplacements, a coast battery, an observation post, five minefields, two defence works, two flame fougasses, four roadblocks, three Canadian pipe mines, beach scaffolding, an anti-tank gun position, a Vickers machine gun emplacement, an anti-tank ditch and an army headquarters (*ibid*).

6.8 PSA5 Thorncombe Beacon to Beer Head

6.8.1 Prehistoric

Palaeolithic and Mesolithic

Some Mesolithic material was recovered during work by the National Trust at Thorncombe Beacon (below).

Neolithic and Bronze Age

Work by the National Trust in 1992 at Golden Cap commenced with a geophysical survey and the half-sectioning of three Bronze Age barrows. This work revealed that the cairns were reworked in the early nineteenth century as part of a Napoleonic-era signal station (Papworth 1993). The report recommended looking at certain sites along this stretch of coast at risk from coastal erosion and subsequently a series of excavations have taken place between 2003 and 2011 at Thorncombe Beacon, Doghouse Hill and Golden Cap. These excavations have added significantly to the understanding of the prehistory of this part of west Dorset because before 1992 very little systematic research had been conducted in the region (Papworth 2013, 243).

Thorncombe Beacon is thought to have first developed as a Bronze Age barrow although evidence points to the site having been disturbed in the Roman period and pottery and flints dating from the Mesolithic to the first century AD indicate general prehistoric activity in the area. There is a Tudor signal station on the beacon as well as a WWII Observation Bunker. The Doghouse Hill excavations revealed a collection of Middle to Late Bronze Age flints, chert and ceramics along with the remains of a settlement (Papworth 2013).

6.8.2 Early medieval and medieval

The literature on the early medieval and medieval origins and development of Lyme Regis has been reviewed by Bellamy and Davey (2011c). The earliest development of the Cobb probably dates to the thirteenth century. Keystone Historic Building Consultants (1994) conducted a survey on the structure detailing its history, construction, use and maintenance, together with other buildings and structures associated with it.

6.8.3 Post-medieval and modern

Clammer (2012) has reviewed the evidence for Napoleonic-era signal stations at Golden Cap and elsewhere along the Dorset coast.

Lyme Regis

Peter Lacey has compiled an account of maritime Lyme Regis' maritime history from the early medieval period to the present (Lacey 2011).

Dorset County Council has produced a comprehensive report on Lyme Regis as part of the Extensive Urban Survey of England, detailing the 'historical, archaeological,

architectural and map evidence relating to the development of Lyme Regis' (Bellamy and Davey 2011c).

West Dorset District Council (WDDC) commissioned and produced a variety of reports as part of a large-scale land stabilisation scheme associated with coastal defence work to protect Lyme Regis from coastal erosion (WDDC 2002; 2005; 2009). Although there is a wealth of historic information on Lyme Bay it seems that only limited information regarding archaeology in Lyme Regis is available. Giffords (2005) produced a historical appraisal for the work which showed that there was a low archaeological potential for finding archaeological remains in Lyme Regis, mainly due to the unstable coastline where much of the archaeology is likely to have been lost to coastal erosion and landslips. Wilson *et al* (2007, 79) recorded ancient sea defences as part of this work before the protection work led to burial 'beneath the new seashore'.

7 Assessment of historic sources

7.1 Historic maps

Fig 7.1 Detail of a topographical map of the Dorset coast from Sir Henry Englefield's 'Geology and antiquities', 1816.

Fig 7.2 Tithe award map for the parish of Burton Bradstock, 1839.

The coastline between Selsey Bill in West Sussex and Portland Bill in Dorset, together with the Isle of Wight, has a wealth of historic maps (for example, Fig 7.1) because of the importance of the frontage for naval and defensive reasons (McInnes and Stubbings 2011, 69–70).

The county of Dorset was mapped from the mid eighteenth century by cartographers including John Roque (1753), Bowen and Kitchin (1760), Thomas Kitchin (1764), John Cary (1787), James Wallis (1812), Thomas Moule (1837) and William Hughes (1868) (McInnes and Stubbings 2011, 75, 79).

The early nineteenth-century Ordnance Survey maps provide some useful detail and have been collected and published by Margary (1981). The *c* 1840 parish tithe award maps and apportionments are particularly useful because they provide a reasonably detailed depiction of the landscape prior to later-nineteenth-century parliamentary enclosures and are in effect maps of the medieval landscape (for example, Fig 7.2).

The tithe maps and the First and Second Edition large-scale OS maps record earlier patterns of land use and land holdings and can be searched for abandoned or shrunken settlements, significant field names, industrial sites, 'antiquities' and also public buildings, military sites, ancient woodlands, orchards, historic parks and gardens. Field-names on the tithe maps can help in the search for the location of 'lost' settlements recorded in documents.

The Phase 1 Assessment report on the survey of industrial archaeology on the Isle of Portland includes a useful list of historic map sources (Stanier and Cox 2007, appendix 2).

7.2 Historic charts

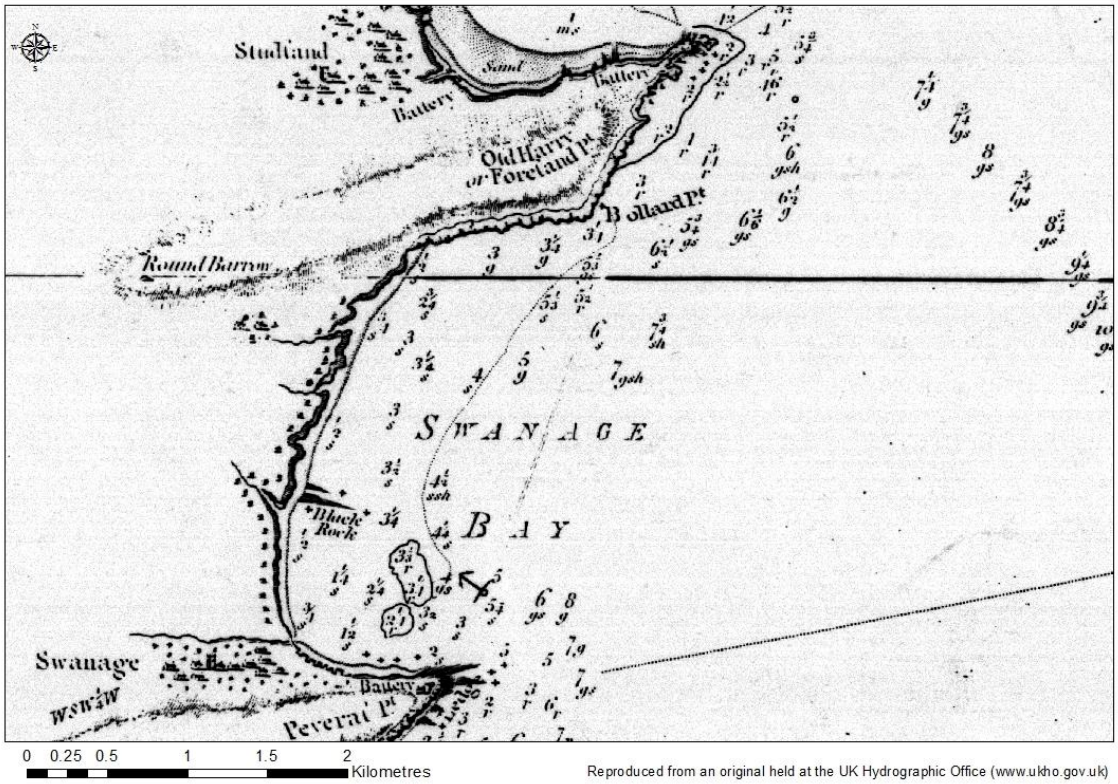

Fig 7.3 Mackenzie's 1785 chart of Poole Bay showing coastal batteries.

Historic charts from the UK Hydrographic Office (UKHO), Taunton were assessed as part of this study together with other charts held by Bournemouth University, Poole Museum and Poole Harbour Commissioners (Appendix 4). It should be noted that the

main purpose of charts is for the safe navigation of ships and shipping at sea, with the earlier charts' coordinates fixed via triangulation and transects at sea creating an inaccuracy factor. Carr (1962) points out that charts prior to the late eighteenth century should be treated with the 'greatest reserve' and that even up to the mid nineteenth century much of the detail on historic maps and charts is inaccurate.

However, many interesting features are shown on historic charts; for example, McKenzie's 1785 chart of Poole Bay has several batteries marked along the coast which provide information on the coastal defences of Dorset in the eighteenth century (Fig 7.3). Chart regression can also elucidate the development of quays and harbours as well as showing prominent wrecks that may cause a hazard to navigation (Fig 7.4).

Many of the charts of Poole and the surrounding areas have been digitised but due to the inaccuracies of the original survey any attempt to accurately georeference to earlier charts may give a false impression of the location of the sites.

'*A coastal historic resources guide for England*' (McInnes and Stubbings 2011), published by the Crown Estate, demonstrates how historic cartography and images can be used to measure coastal change and contains a section describing historical resources available by region.

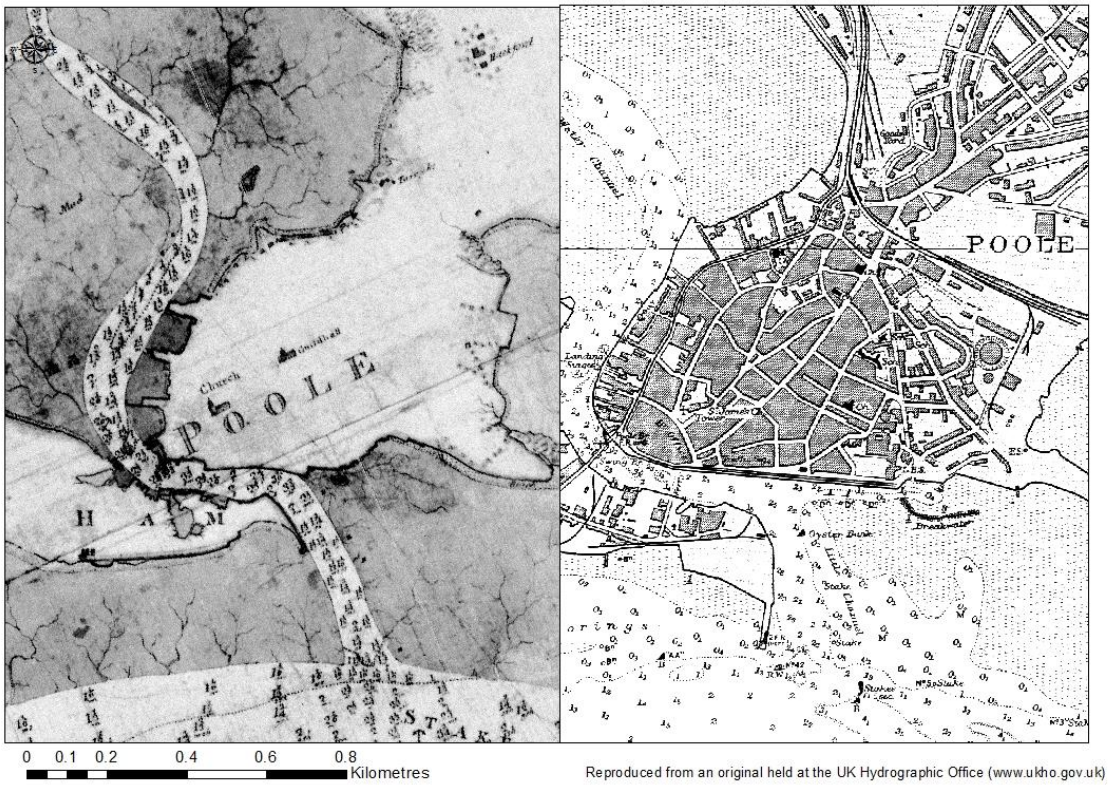

Fig 7.4 Comparison between McKenzie's 1785 chart of Poole Bay and a 1954 survey.

8 HER, NRHE and other data sets

8.1 Introduction

Tabular and spatial data for the Dorset RCZAS were requested from the Dorset HER and the NRHE database and loaded into an ArcGIS layer in the project GIS.

The GIS was used to produce gazetteers and as a structured way to update and create records (for subsequent update to HBSMR). The gazetteers included new sites and the existing records that have been updated by the RCZAS DBA. The GIS was the reference basis which the later HBSMR update stage built upon; data were entered by remote access on to Dorset HBSMR via dongle (the GIS method is set out in Appendix 1 at the end of this report).

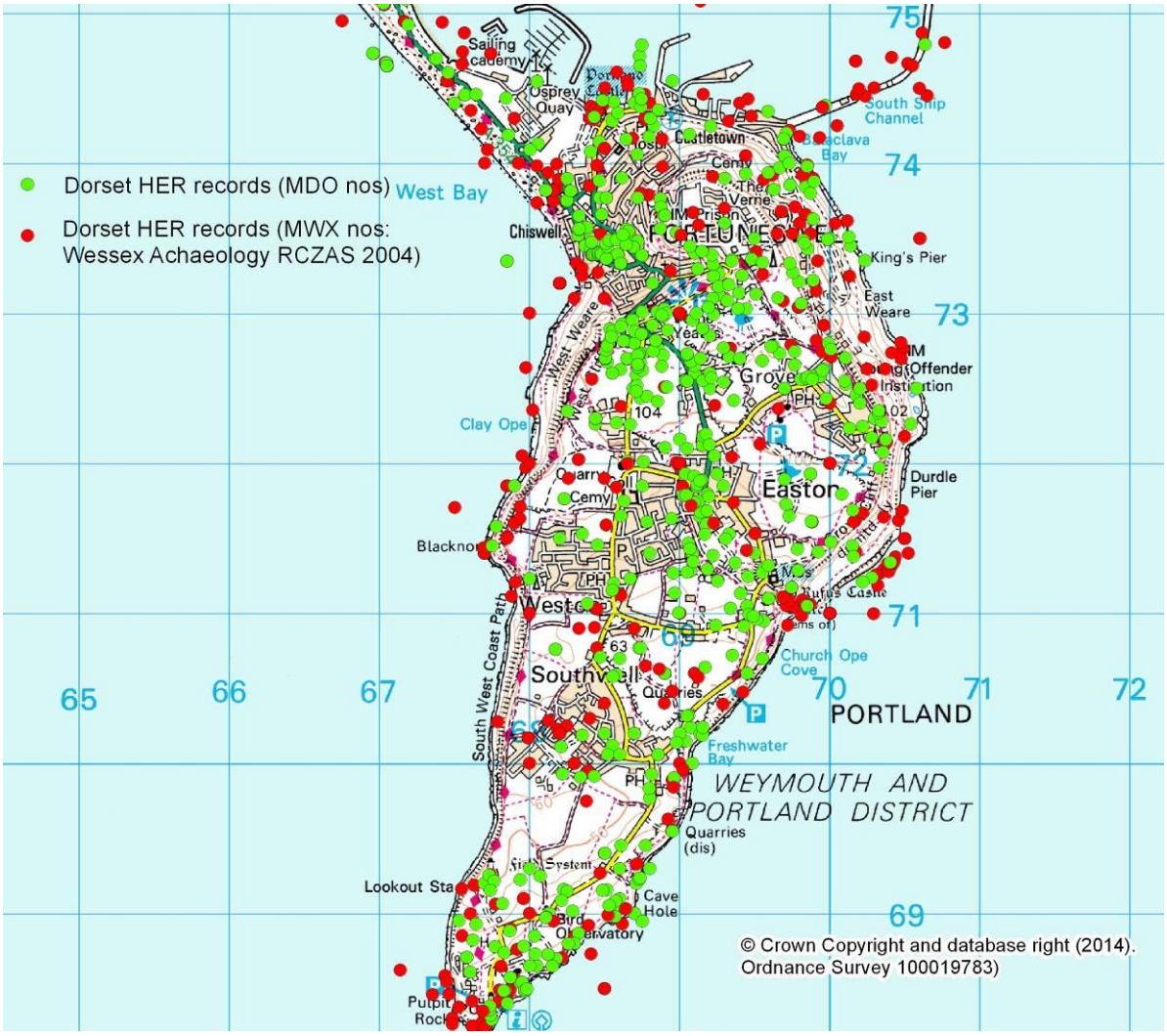

Fig 8.1 Map showing the density of HER records for the Isle of Portland.

8.2 RCZAS and South Dorset Ridgeway NMP data

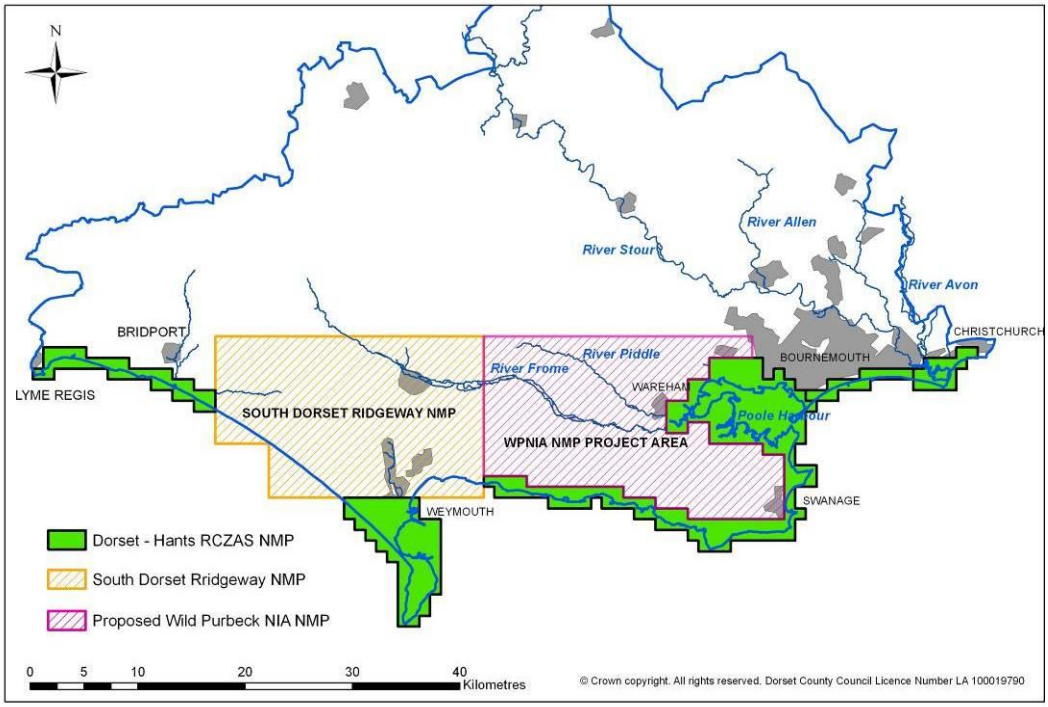

Fig 8.2 Map of Dorset showing the Dorset RCZAS NMP study area and other completed or proposed NMP projects.

The National Mapping Programme (NMP) component of the RCZAS was carried out by HE Projects in 2013 (Fig 8.2). The primary aim was to provide a rapid baseline survey of the Dorset to Hampshire coast to enhance understanding of the range of historic assets available there in order to facilitate assessments of their significance and permit effective management of the resource (Royall 2013).

Period	Updated Sites	New Sites	Total
Neolithic	27	12	**39**
Bronze Age	302	163	**465**
Iron Age	50	12	**62**
Prehistoric/Roman	416	468	**884**
Roman	18	10	**28**
Early medieval	0	1	**1**
Medieval	15	24	**39**
Post medieval	33	664	**697**
Historic	46	345	**391**
Modern	26	62	**88**
Undated	61	341	**402**
Total	**993**	**2103**	**3096**

Table 8.1 Numbers of sites recorded in the NMP project database.

The project achieved this aim by providing significant enhancement to existing baseline data in the Dorset HER through the mapping, interpretation and recording of 3096 archaeological sites, of which 2103 were new sites, previously unrecorded.

New sites provisionally allocated a Neolithic date included nine potential long barrows and 'short' long barrows, one mortuary enclosure and two pit circles.

One hundred and sixty-three new Bronze Age barrow sites were identified, confirming that these funerary monuments extended right across the downlands. Although few settlement sites and field systems were interpreted as Bronze Age, a number of enclosures and roundhouses were mapped which might offer evidence of Bronze Age settlement or at least have Bronze Age antecedents.

The greatest numbers of sites recorded were dated to the later prehistoric and Roman periods; 974 sites were assigned an Iron Age, prehistoric/Roman or Roman date, of which 49% were new to the record. Types of new sites attributed to these periods included banjo enclosures and extensive field systems as well as three Roman buildings and a possible Roman temple or shrine.

The early medieval period is poorly understood in Dorset and only one site was identified. New sites relating to the later medieval period were sparse, with only 24 identified during the mapping. All these were agricultural features such as field boundaries, field systems, cultivation marks and trackways.

The second greatest period total of sites recorded during the project was for post-medieval features, with 697 sites attributed to this period. This is a period that has, until fairly recently, been overlooked by archaeological survey and field investigation and therefore 664 (95%) of sites were new to the record. The NMP project was perhaps one of the first to systematically record post-medieval sites.

The systematic recording of military sites, particularly using the RAF vertical photographs taken during and soon after the war, has proved highly informative with many significant sites, particularly those associated with the coastal defence and anti-invasion sites, being recorded for the first time.

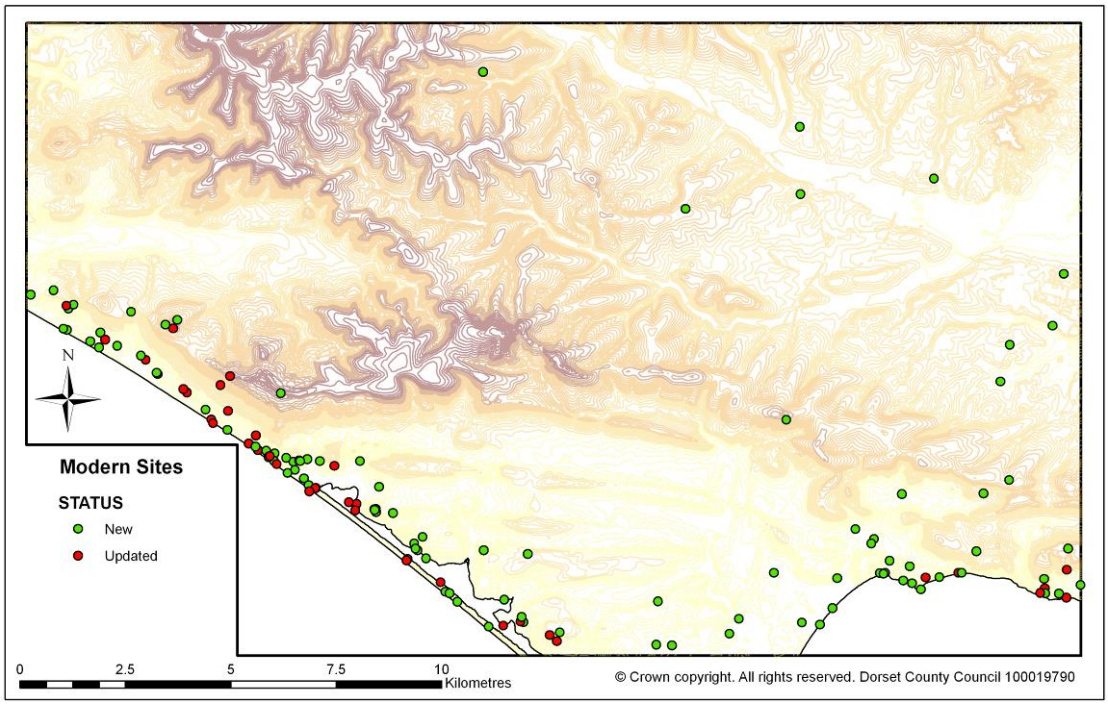

Fig 8.3 Distribution of twentieth-century sites identified by the South Dorset Ridgeway NMP project.

Part of the study area, including part of Chesil Beach, Osmington and Abbotsbury, was covered by the South Dorset Ridgeway NMP project (Royall 2011). This project did not identify any prehistoric sites or Roman sites in the study area but did identify new medieval, post-medieval and twentieth-century sites. Of the 135 twentieth-century sites recorded during the course of the project, nearly three quarters (99 sites) were

new to the record. The majority were recorded as extant structures on post-war air photographs, however it is not known how many still survive.

As the distribution map in Figure 8.3 above shows, the majority of the sites are on the coastal strip along Chesil Beach and to the east of Weymouth and most relate to anti-invasion defences associated with the fortification of Britain in 1940-1941 after the evacuation of British troops from Dunkirk in June 1940. At this time there was an urgent need to build defences in response to the threat of invasion from occupied France (Dobinson 1996; Foot 2006).

8.3 Dorset HER

Entries into the HER by the Dorset HER team have the prefix MDO, entries made by Wessex Archaeology during the 2004 RCZAS have the prefix MWX. The DBA undertaken as part of the current project has created 984 new sites and updated another 143 records for sites already recorded in the HER. A number of other sites have been identified as misplotting or as duplicates of other records. As CAU will be entering data directly into the Dorset HER database, any new records will automatically have the prefix MDO, or SDO if new source records are created.

8.3.1 Prehistoric and Roman

Prior to this project there were 757 prehistoric entries recorded in the HER within the study area, with a further 110 prehistoric / Roman sites, the latter being either multi-period sites or sites where there was degree of uncertainty about the date. There were 357 Roman sites and ten Roman/early medieval. The NMP component of the current project added 175 earlier prehistoric sites and 974 later prehistoric or Roman sites. The DBA component has created three new Bronze Age sites (barrows?), one Bronze Age or post-medieval site (barrow?, spoil heap?), one Iron Age site (storage pit) and one Late Iron Age or Roman site (midden).

8.3.2 Early medieval and medieval

Prior to this project there were 68 early medieval sites, 31 early medieval / medieval sites and six early medieval to post-medieval sites. There were 502 medieval sites, and 273 medieval/post-medieval sites. The NMP component added 39 medieval sites and the DBA component has added two new medieval sites (rabbit warren?, planned urban settlement) and three medieval or post-medieval sites (strip lynchet, mill and battery).

8.3.3 Post-medieval

Prior to this project there were 4049 post-medieval sites and 555 post-medieval / modern sites recorded in the HER. The NMP component added 664 new sites to the record and the DBA component has added 656 new post-medieval sites and six post-medieval or modern sites.

8.3.4 Modern

Prior to this project there were 1663 modern sites recorded in the HER. This includes 215 monuments arising from the Defence of Britain (DoB) project which were incorporated into the HER by Wessex Archaeology during the 2004 RCZAS. The NMP component added 62 modern sites and the DBA component has added 307 new modern sites.

There is a very large concentration of aircraft crash sites around the coasts of Dorset, Hampshire and the Isle of Wight. This is not believed to be significant in terms of the actual distribution of aircraft crash sites on the seabed, but rather reflects local HER enhancement exercises which then appear to have been uploaded into the NRHE (*cf* Wessex Archaeology 2008, 19).

8.3.5 Undated / uncertain

The HER contains 422 records where the period is 'uncertain' and six recorded as 'error'. The DBA classed two features, both earthworks shown on historic OS maps, as of 'Uncertain' date. They are likely to be medieval or post medieval.

8.4 NRHE data

Point, line and polygon data was provided by the National Record of the Historic Environment (NRHE) as a shapefile and added to the GIS layers represented on the digital mapping for the project.

The Monuments Inventory component of this dataset is described as having

> 'evolved from material pooled from a number of sources: OS and RCHME record cards, records migrated from other datasets such as the National Buildings Record, records created by English Heritage field teams and Aerial survey or by Desk based enhancement projects. The monuments included cover the whole heritage spectrum from flint scatters to factories, from historic cinemas to cemeteries and from monasteries to military airfields. Some records will be of designated sites, but far from exclusively so. . . The database contains the only really consistently recorded national database of maritime monuments, including sunken wrecks of vessels and military aircraft as well as other maritime archaeology sites.'
> (http://services1.arcgis.com/GKHFS1tjFvm1DyXI/arcgis/rest/services/NRHE_Monuments/FeatureServer/0) [accessed 6/11/2014]

Data type	No of records
NRHE Monument Point records	885
NRHE Monument Lines	31
NRHE Monument Polygons	995
NRHE Event points	625

Table 8.2 Number of NRHE records coinciding with the Dorset RCZAS study area.

Overall, it is clear that the NRHE dataset for the project area, a total of 1911 records for heritage assets (Table 8.2), is substantially smaller than that in the Dorset HER, which, prior to the current project, totalled more than 11,000 records.

Technical advice was sought but it was apparently not possible to compare the two datasets using GIS resources and assess the extent of overlap. Visual inspection of the records when displayed on the GIS mapping indicated that a substantial proportion of the records within the NRHE dataset were paralleled by records in the Dorset HER. It is understood that county HERs were incorporated during the initial compilation of what is now the NRHE dataset, so this is unsurprising. Additionally, it is evident that the 2004 RCZAS project undertaken by Wessex Archaeology used NRHE data as the basis for numbers of new records in the Dorset HER for assets which had not previously been recorded there.

There are examples, however, of parallel records in the NRHE dataset and Dorset HER which differ considerably, and have clearly been created in isolation from each other and by separate processes. The disparity in numbers of records also highlights the fact that there are numerous Dorset HER records which are not matched by NRHE data, but it is also apparent that there are some NRHE records which do not exist in the HER. Some of these are likely to have been produced by RCHME and English Heritage field investigations and themed projects, but the limited information attached to the NRHE dataset means that the origins of the record are not always clear.

NRHE line data – among the 31 records of this type are Roman roads, railway lines, turnpikes, breakwaters and other linear features – are not incorporated into the Dorset

HER in linear form, although it is likely that point records exist for most if not all of the assets represented.

A substantial proportion of the NRHE polygon data also appears to be paralleled by HER point records. There are exceptions but in at least some of these instances the records are again likely to derive from RCHME and English Heritage field investigations or themed projects. The NRHE polygon data includes wreck and aircraft crash site data, much of it apparently not tightly located and held within large 'portmanteau' polygons covering a significant area and substantial numbers of records. Where checked, it appeared that many of the wreck data are paralleled in HER records.

The NRHE event data includes desk-based assessments and a variety of archaeological interventions, but also the locations of sites covered by RCHME and EH investigations during themed projects and some events apparently identified from OASIS records. Some of these records are paralleled in the Dorset HER events record.

The technical problems in using GIS facilities to distinguish records unique to the NRHE dataset and the impracticability of reviewing all the records in the dataset one by one meant that it was not possible within the time frame and other priorities of the RCZAS to incorporate heritage assets from the NRHE dataset into the new sites created during the project.

It seems probable that a comprehensive migration of NRHE records not currently held in the Dorset HER would require a discrete project with appropriate technical and time resources.

8.5 Wrecks

When dealing with shipwrecks it is very important to take into account historical variations in UK wreck recording. Many vessels will have been lost with no record being made. This is particularly and very obviously true of prehistoric losses. Roman loss records are extremely unusual and early medieval records are rare and often uninformative. Medieval records, particularly prior to the thirteenth century, are also unusual. Systematic loss recording only commenced in the eighteenth century with Lloyd's List, although it cannot be relied upon as a comprehensive record until well into the nineteenth century, and then only for larger vessels (Wessex Archaeology 2007, 23).

Hydrographic data provided by Seazone Solutions charts 118 known wrecks within 500m of the survey area. Of these, 54 are outside the survey area, 25 are below LAT, 32 are in the intertidal zone and seven are inland (Fig 8.4). The NRHE database has 29 wrecks marked as point data and 439 wrecks as polygons; it should be noted that the majority of these are recorded events rather than actual remains of vessels (Fig 8.5). The Dorset HER lists 1038 wreck sites as points and 105 as polygons (Fig 8.6) but again many of these are reported wreck events rather than actual archaeological remains. There also appears to be a large degree of duplication in the data; for example, the landing craft hulks in the port of Poole have multiple entries in the database (Fig 8.7). It should also be noted that there is a large amount of duplication in and between the different datasets.

There are also errors in the identification of vessels. For example, in the Ro-Ro 1 collection a Landing Craft Barge installed in 1950 is recorded in the HER as the *Vespa Star,* a MFV previously owned by the Beatles' recording company which was hulked on the site in 1974 (Bournemouth University 2014).

Large concentrations of hulked and abandoned vessels can be found in the creeks and back waters of Poole Harbour, in particular Holes Bay and Lytchett Bay (Davies 2011; Fig 11.1). Many have been mapped from aerial photographs and entered into the HER database but no details on the vessels are present. Other wrecks have been identified which are not in the relevant databases; the most significant identified to date is a WWI seaplane lighter in Poole Harbour, the first purpose-built vessel for carrying aircraft.

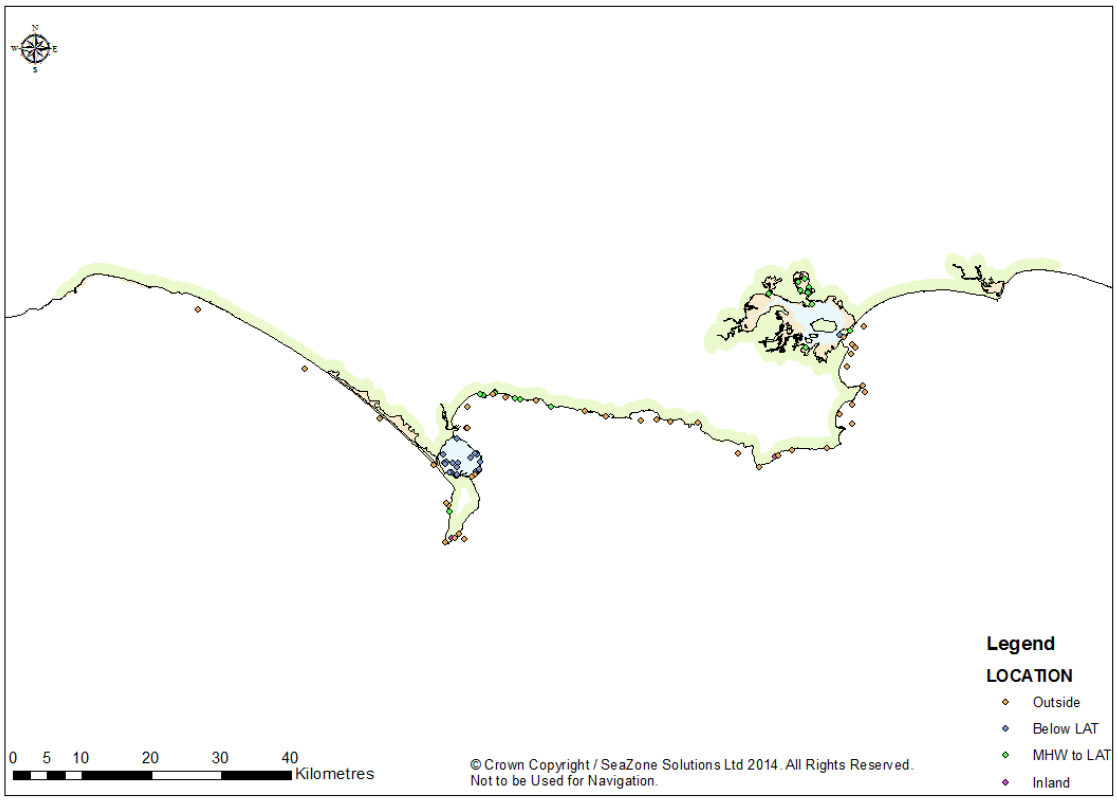

Fig 8.4 UK Hydrographic Office wreck data along the Dorset coast.

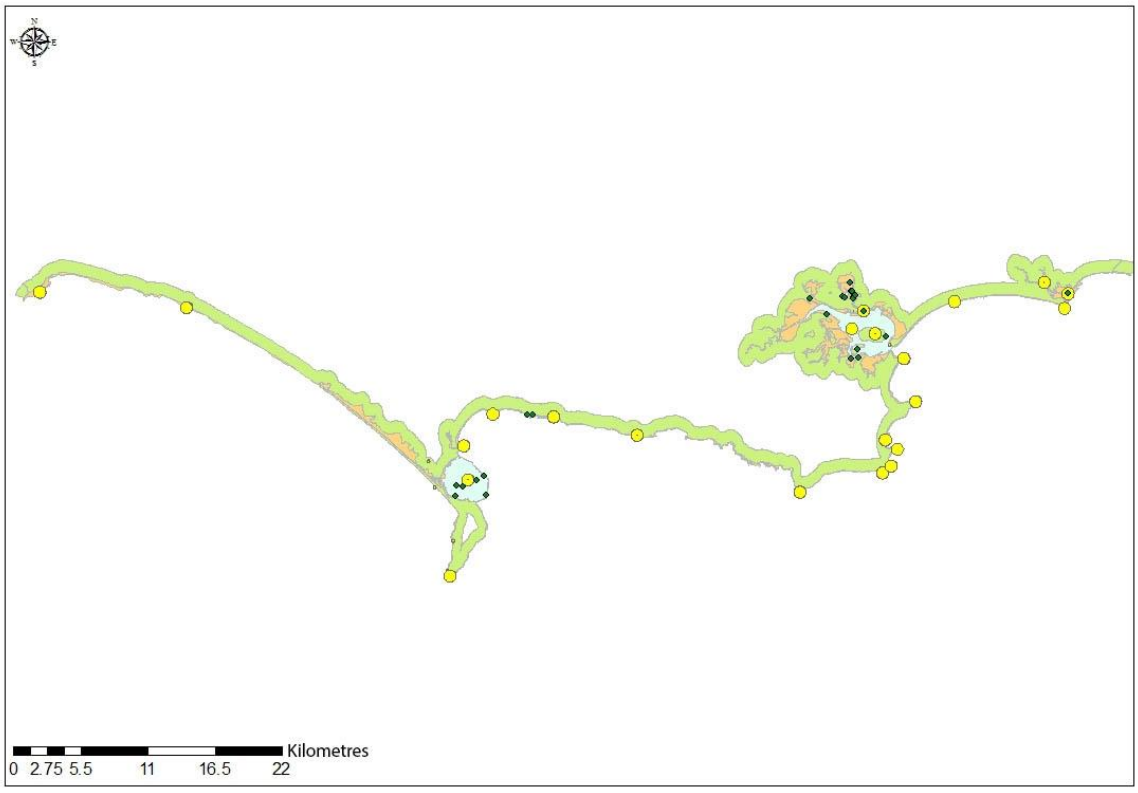

Fig 8.5 Wrecks shown in the NRHE database.

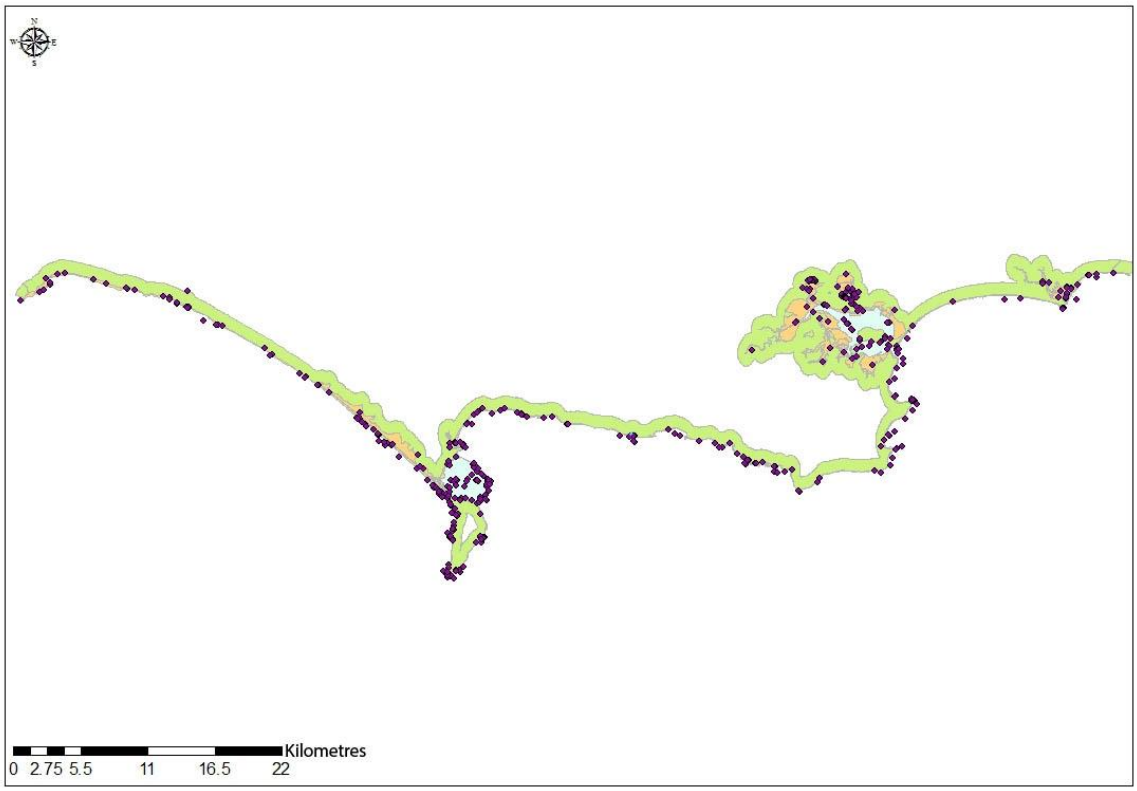

Fig 8.6 Wrecks recorded in the Dorset HER.

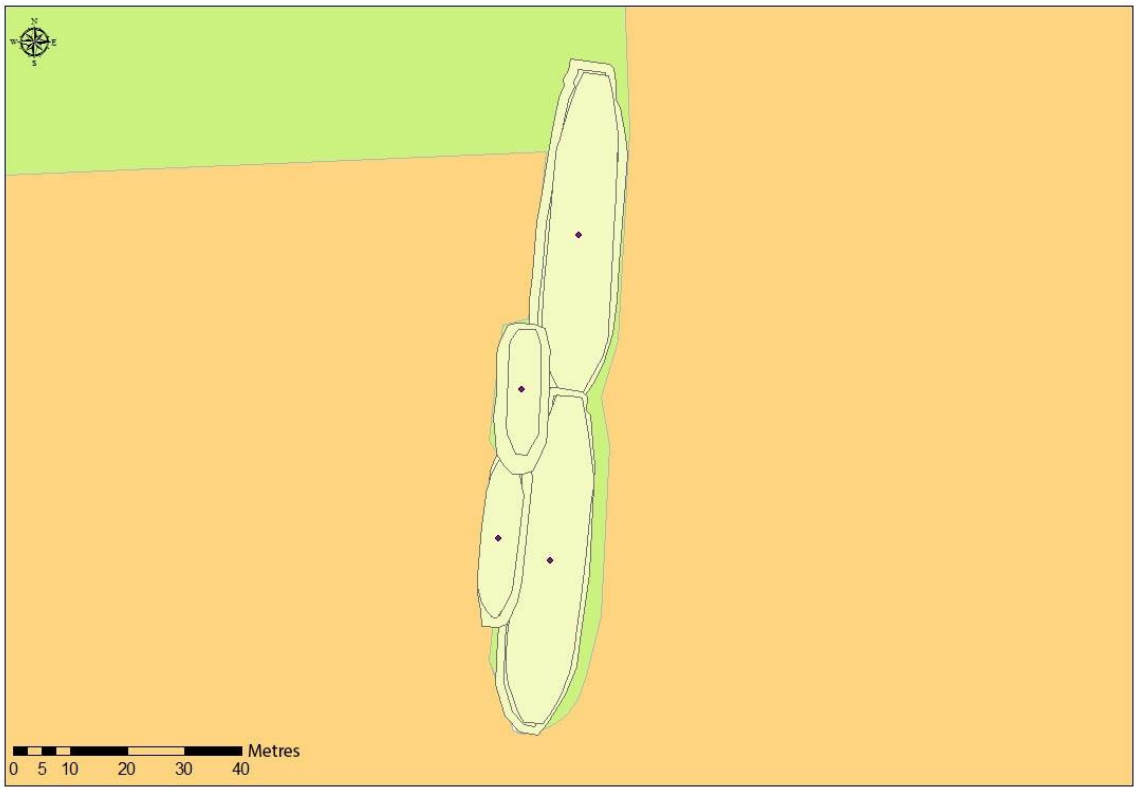

Fig 8.7 Dorset HER datasets showing multiple polygons and one point data for each of the hulks in the Ro-Ro 1 landing craft collections.

8.6 Portable Antiquities Scheme

Following advice from the Finds Liaison Officer for Dorset, the current project team registered to use the Portable Antiquities Scheme (PAS) database and applied for higher level access to view findspot data. The data for Dorset was exported from the PAS database as an Excel spreadsheet, transferred to a shapefile and uploaded into the project GIS, where sites falling within the project area were isolated as a separate dataset.

A total of 5870 finds from Dorset had been recorded on the PAS database at the time the records were obtained in October 2014. Of these, 154 fall within the RCZAS project area (Fig 8.8). These are analysed by period and artefact material (Table 8.3) and then for each of the sub-cells of the Shoreline Management Plan units, moving from east to west through the project area (Tables 8.4–8.9).

Fig 8.8 Finds from the PAS database recorded in the Dorset RCZAS study area.

Period	Lithics	Ceramic	Glass	Shale	Metal	Total
Mesolithic	2					2
Neolithic	24					24
Bronze Age					1	1
Iron Age		2			42	44
Roman	5	13	1	2	14	35
Early Medieval					1	1
Medieval		21			7	28
Post Medieval		2			13	15
Undated	1	1				2
Unknown	2				1	3
Total	**34**	**39**	**1**	**2**	**78**	**154**

Table 8.3 Finds from the PAS database analysed by period and artefact material.

Approximately half the finds recorded from within the coastal zone come from a relatively small length of coast in the centre of the project area, within what may be assumed to be the catchment area of Dorchester. This may reflect the fact that the PAS Finds Liaison Officer is based there or is perhaps a consequence of the work of particular metal-detectorists and fieldwalkers: the complete PAS dataset for Dorset also

shows a degree of clustering in the wider Dorchester area. On the other hand, many of the other coastal zone finds appear to cluster in areas adjacent to the major urban concentrations along the Dorset coast, and the overall distribution may more closely reflect higher densities of active detectorists and fieldwalkers in these areas, as well as concentrations of people engaged in leisure activities along the coast who may have made and reported casual finds.

The finds recorded clearly do not represent a statistically valid sample of potential finds from the area. For example, the substantial numbers of Iron Age coins in the dataset, particularly those of gold and silver (a total of 41 coins, including 17 of silver, nine of gold), by comparison with those of the Roman period (nine coins, all of copper alloy), indicates a particular bias in reporting. The very clear variations in the mix of artefact materials in the different coastal sub-cells also presumably reflects the differing collecting strategies of the various individuals who have reported to the PAS from these areas. Nonetheless, the Scheme brings into view numerous potentially archaeologically significant items which might not otherwise be reported or recorded, adding an important further layer to the data available to inform research and future management of the historic environment resource.

8.6.1 PAS finds from PDZ2 Christchurch Harbour and Central Poole Bay

The finds from this area (Table 8.4) include four Iron Age gold coins, three of which came from Hengistbury Head. A copper-alloy palstave has been recorded from the Bournemouth area.

	Lithics	Ceramic	Metal	Total
Mesolithic	1			1
Neolithic	2			2
Bronze Age			1	1
Iron Age		1	4	5
Medieval		10		10
Undated	1			1
Total	**4**	**11**	**5**	**20**

Table 8.4 PAS finds from PDZ2 Christchurch Harbour and Central Poole Bay.

8.6.2 PAS finds from PDZ3 Poole Harbour and associated coastline

An Iron Age silver coin has been reported from the Poole urban area, with a further silver coin of this period and a gold one from the Wareham area (Table 8.5). Wareham is also the location for the other finds: an early-medieval strap fitting, a medieval seal matrix and an undated gold ring.

	Lithics	Ceramic	Metal	Total
Iron Age			3	3
Early Medieval			1	1
Medieval			1	1
Unknown			1	1
Total			**6**	**6**

Table 8.5 PAS finds from PDZ3 Poole Harbour and associated coastline.

8.6.3 PAS finds from PDZ4 Swanage (Handfast Point to Durlston Head)

No finds from this area are recorded on the PAS database, despite its proximity to the rich archaeological zone on the Isle of Purbeck.

8.6.4 PAS Finds from PSA1 Durlston Head to White Nothe

This is a substantial area incorporating a zone known for the density of its prehistoric and later occupation. No metalwork finds have been recorded and only two pieces of worked shale, although the two items recorded as lithics of the Roman period may also have been of shale (Table 8.6).

	Lithics	Shale	Ceramic	Metal	Total
Neolithic	15				15
Roman	2	2	2		6
Medieval			11		11
Post Medieval			2		2
Total	**17**	**2**	**15**		**34**

Table 8.6 PAS finds from PSA1 Durlston Head to White Nothe.

8.6.5 PAS Finds from PSA2 White Nothe to Redcliff Point

The sole find recorded form this area is a medieval silver coin from the parish of Osmington.

8.6.6 PAS finds from PSA3 Redcliff Point to Portland Bill

The metalwork finds recorded from this area comprise an Iron Age silver coin, a medieval token, two post-medieval tokens and two buckles (Table 8.7).

	Lithics	Ceramic	Metal	Total
Iron Age			1	1
Medieval			1	1
Post Medieval			4	4
Total			**6**	**6**

Table 8.7 PAS finds from PSA3 Redcliff Point to Portland Bill.

8.6.7 PAS finds from PSA4 Portland Bill to Thorncombe Beacon

More than half of the PAS find records from the project area, and more than two-thirds of the metalwork items reported, are for this one stretch of coast (Table 8.8). Unusually, 15 items, all of the Roman period, are recorded as stratified finds from an archaeological excavation in the parish of Preston, near Weymouth; a further six records probably represent unstratified finds from the same investigation. A total of 32 Iron Age coins are recorded, most from Wyke Regis, with smaller numbers from Langton Herring and Abbotsbury. The Roman-period stonework comprised a quern, a spindlewhorl and a gaming board.

	Lithics	Ceramic	Glass	Metal	Total
Mesolithic	1				1
Neolithic	6				6
Iron Age		1		33	34

Roman	3	13	1	11	29
Early Medieval				1	
Medieval				2	2
Post Medieval				5	5
Undated		1			1
Unknown	1				1
Total	**11**	**15**	**1**	**52**	**79**

Table 8.8 PAS finds from PSA4 Portland Bill to Thorncombe Beacon.

8.6.8 PAS finds from PSA5 Thorncombe Beacon to Beer Head

Six of the eight finds from this area are coins, including individual examples of Iron Age and medieval date; the remainder are post medieval (Table 8.9). Five of the finds came from the shore in the urban area of Lyme Regis.

	Lithics	Ceramic	Metal	Total
Neolithic	1			
Iron Age			1	1
Medieval			1	1
Post Medieval			4	4
Undated	1			
Total	**2**		**6**	**8**

Table 8.9 PAS finds from PSA5 Thorncombe Beacon to Beer Head.

8.7 Receiver of Wreck

A request was sent to the Receiver of Wreck (RoW) for digital information relating to 'wreck' (i.e., recovered artefacts), but this was delayed due to computer failures and work overload and was not available to be included in this report. The information is held by the RoW as 'Droits', although they only deal with finds from within the ebb and flow of the tide. Such data is routinely sent to EH and incorporated into the NRHE; however, due to the same computer failures and general work overload EH has not received any droits data since 2011.

8.8 Lidar

For the study area, 1m resolution DSM Lidar gridded raster data is available to download from the Channel Coast Observatory, covering the whole survey area (Fig 8.9) and was used in conjunction with digital aerial photography by the NMP component of the project (Royall 2013). In addition to this, 0.5m resolution ASCII Lidar, both Digital Surface Models (DSM) and Digital Terrain Models (DTM), can be obtained from the Environment Agency's Geomatics Group, covering the coast from Barton-on-Sea in the east of the study area to Worth Matravers, just to the east of St. Alban's Head, including Poole and Christchurch Harbours. The coverage resumes from Ringstead Bay to Seaton, including Weymouth, Portland and Chesil Beach. The area around Lyme Regis is also covered.

Lidar provides an accurate three-dimensional measurement of surface but due to the relatively coarse resolution of the data it is best suited to large-area surveys (Crutchley and Crow 2009). The data is usually provided in a gridded form, either ASCII XYZ point

or a raster, which can be interpreted through GIS; however, when viewing the data in GIS it may be necessary to change the symbology and scale in order to get a better understanding. The English Heritage guidelines recommend that when assessing Lidar data, it should be viewed stereoscopically, 'taking advantage of the brain's natural ability to interpret three-dimensional objects aided by the opportunity to stretch and light the surfaces differently' (Crutchley and Crow 2009 22)

A major advantage of Lidar data is the ability to create digital terrain models (DTM) of the landscape which would usually be obscured by trees; by analysing the waveform and return from each pulse it is possible to remove the tree from the data providing a bare earth model which may show up hidden archaeological features. The disadvantage to DTM is that it can smooth out the data, losing detail. Therefore in open ground DSM is preferred (Crutchley and Crow 2009).

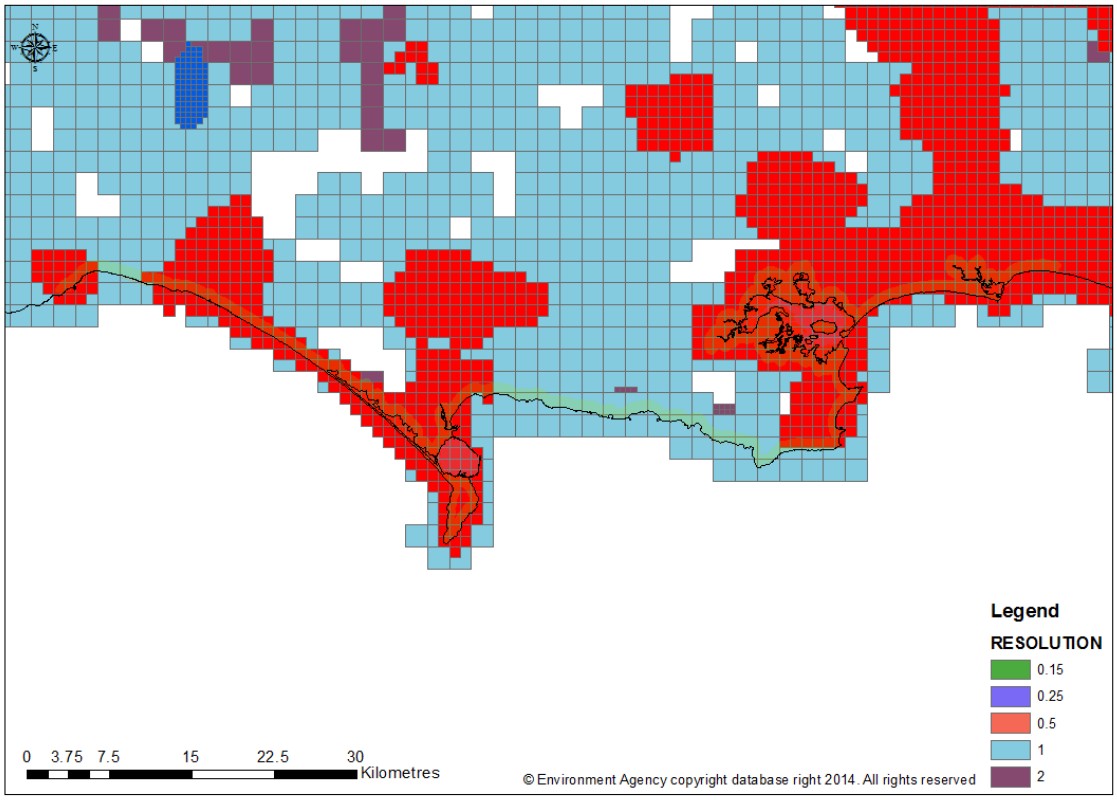

Fig 8.9 Lidar coverage for the Dorset coast.

A major disadvantage of the Lidar data available is the relatively large cell size, and the averaging out of the data when it is gridded. This could mean several squares could have more than one hit per square metre and others could have none. Crutchley and Crow (2009) give two examples of this affecting the data, one is Stonehenge, where several of the blue stones are not present on the Lidar data, and the other is a Welsh promontory fort where the cliff positions given by the Lidar are out from the actual positions and heights due to the averaging of the cell.

With the capacity of Lidar to pick up minute changes in height, features that were previously thought to be ploughed out can be seen on Lidar. In the Lidar review for the Severn Estuary RCZAS, Truscoe (2008) suggested that Lidar data should be used to compliment the aerial photography, as sites visible on one survey method may not be visible on the other. For the intertidal zone the Lidar data did provide some additional data to the aerial photography but also missed key features.

8.9 Borehole data

Several geological borehole logs are available for the study area from the British Geological Survey (BGS). These can be mapped into GIS using their WMS service but the associated logs are scans of paper records and would have to be manually downloaded and input into the system. These logs are described from a geotechnical viewpoint rather than a palaeoenvironmental or geoarchaeological perspective, so lack some of the detail normally required. It may be possible to reassess the cores if they are still held by the BGS.

As part of a channel-deepening scheme in Poole Harbour a series of borehole samples were taken along the main channel and assessed with sub-bottom profiling data as part of an archaeological EIA (Wessex Archaeology 2004b). A second EIA was conducted as part of a marina development inside Poole Harbour, which mapped the peat layer to the west of the town; boreholes were taken which were assessed for archaeological potential (Ramboll 2014).

If borehole records from other commercial developments could be obtained it might be possible to map the depth and extent of the peat layers to create a deposit model of the buried peat layers.

It is unlikely that palaeochannels will be identified from boreholes alone. For this to be possible bathymetry and sub-bottom profiling would need to be conducted across the harbour.

NB. The area below LAT is not covered by this study and work done on offshore submerged landscapes is therefore not included in this report.

9 Assessment of areas of archaeological potential and low record density

9.1 Areas of greatest potential

Hengistbury Head is a Scheduled Monument (NHLE 1002367) covering an area of 87ha and is considered to be of international archaeological significance (see above, section 6.1).

Poole Harbour has been identified by English Heritage as one of the most important areas for coastal archaeology in England (Royal Haskoning 2011). Its continuous use, from prehistoric times to the present, means that structures of almost any date could survive. The area contains a network of Iron Age settlements, such as those located on Furzey Island and Green Island, which were exploiting mineral resources both within Poole Harbour and from the Isle of Purbeck. It has been historically important as a commercial harbour since pre-Roman times.

Other areas in Poole and Christchurch Bays which have especially high archaeological potential are: Poole Old Town; Lower Hamworthy (Roman military site and port); the Stour Valley; the Northern Heathland; Upper Hamworthy (Rockley Sands, Turlin Moor and Upton Park); the shores and beaches of Poole Harbour including Lytchett, Holes and Parkstone Bays; the Poole Bay Littoral; and the Roman road and its environment.

The historic importance of Poole is reflected in the number of designations in the area. There are over 200 Listed Buildings of special architectural or historic interest and 13 Scheduled Monuments within the Borough of Poole, most of which are located in the Old Town, Quay and High Street Conservation Areas.

The Fleet lagoon behind Chesil Beach is an area where a sheltered shoreline would have enabled access to coastal resources, lending itself to prehistoric occupation. Peat has been identified within the Fleet as well as being washed ashore on Chesil Beach during storms. The preservation of peat and hence, the survival of submerged landscapes in which it lies, not only suggests a protected environment but presents opportunities for the recovery of prehistoric archaeological material (Maritime Archaeology 2007, 68).

The important Mesolithic site at Culver Well on the Isle of Portland (NHLE 1002406) provides an indication of Early Holocene coastal activity and is a rare occurrence of a Mesolithic shell midden in southern England (Fig 9.1). There is potential for loss of a small area of Mesolithic sites near Culver Well due to coastal erosion.

Dorset is notable for, among other features, the presence in the coastal zone of numerous tracts of well-preserved field systems, specifically the large areas of lynchetted 'Celtic fields', medieval strip lynchets and the 'lawns' of Portland's open fields. In many instances it is evident that settlements associated with these fields survive in the near vicinity. The 'legibility' and extensive nature of these systems make them particularly significant. Designated examples include the Warren field system (NHLE 1018435) on the cliffs behind Durdle Door and Bat's Head, west of Lulworth Cove, spectacular strip lynchet systems on St Catherine's Hill, Abbotsbury (NHLE 1015694) and at East and West Man, Worth Matravers (NHLE 1019951) and the open fields on Portland (NHLE 1002729), all of which are Scheduled Monuments. The unusual later prehistoric coastal enclosed sites of Bindon Hill (NHLE 1002705) and Flowers Barrow (NHLE 1008141), also Scheduled, are potentially threatened by continuing coastal erosion.

Undesignated but of particular importance are the extensive areas of rectilinear field systems and 'strip territories' which extend inland from the coast on the southern side of the Isle of Purbeck and in the Christchurch area (Taylor 1970; Davey 2013). These potentially have origins in the Middle Bronze Age and have clearly had a significant impact on the development of the historic landscape over a long period. The seaward end of the divisions are subject to loss to coastal erosion along the coast west from Durlston Head and to continuing development near Christchurch.

Fig 9.1 Culver Well Mesolithic site (© A J Smith under the Creative Commons Attribution-Share Alike 3.0 Unported licence).

The defence area at Studland Bay (PDZ3) played an important role in WWII and all aspects of that role are represented by the surviving material evidence: anti-invasion defence, petroleum warfare experiments and assault training. Apart from some minor housing development within Studland village there has been remarkably little change to this landscape over the past 65 years. Although many of the defence works have long since been cleared away, enough survive, with excellent documentary and photographic evidence, for the strategy of defence and the function of its various components to be appreciated. Fort Henry is of interest because of its role in the 'Exercise Smash' component of the D-Day preparations and the army commanders and national leaders who visited it. Also important are the sites associated with petroleum warfare, a category of defence provision for which there is little surviving physical evidence (Foot 2006, 68–9).

The WWII defences at Abbotsbury (PSA4) form part of a well-known historic landscape, including St Catherine's Chapel and St Peter's Abbey Barn, and can be understood within a landscape that has received few physical changes since the end of the war. The preservation of the remaining components of the WWII defence is vital to represent these later additions (Foot 2006, 59-61).

9.2 Areas of low record density

The average density of HER records across the study area as a whole is approximately 61 per sq km. Much the highest densities are found in older historic settlements, particularly urban areas, reflecting the wide variety of historic features shown on historic mapping and a concentration of local historical research, as well as high numbers of designated buildings.

Areas which currently have few HER records obviously have some potential for future research. However, it is clear that in some parts of the current project area low densities are directly attributable to the dynamic physical nature of the landscape,

which has concealed if not destroyed time depth in the observable archaeology. Obvious examples include areas of unstable coastal cliffs such as the Lyme Regis Undercliff, those fronting Ringstead Bay and those at Osmington, where some features described in the nineteenth and early twentieth centuries are no longer extant. Some intertidal areas are likely to similarly have limited potential because of the degree to which physical conditions have concealed or destroyed archaeology.

Elsewhere, it is clear that there are many rural areas within the coastal zone with apparently low densities of HER records, even after the substantial boost achieved through the National Mapping Programme and the current project. However, it is important to remember that densities shown by HER point data in such areas do not reflect the extensive character of much of the archaeology on the ground. Obvious examples are the large areas covered by lynchetted 'Celtic' field systems, systems of strip lynchets or extensive quarrying and gravel extraction; in each of these cases significant remains covering many hectares may be represented by a single 'dot on the map'. The long boundaries and enclosed areas making up the 'strip territories' which extend over the south-eastern portion of the Isle of Purbeck are similarly extensive but generate relatively few if any HER points.

Low record densities are also apparent in rural areas with low densities of farm and village settlements. Examples include the area between Charmouth and Golden Cap, the coastal zone between West Bay and Burton Bradstock, the vicinity of Redcliff Point and the area to the west of Lulworth Cove; in each of these there are numbers of kilometre squares with fewer than ten HER records. Given the caveat noted above, however, about single points representing very extensive areas of archaeology – clearly the case for the latter example – it is in fact difficult to highlight particular rural areas where record densities are significantly low.

In addition, low record densities occur in some areas of extensive twentieth-century suburban development, such as Wyke Regis, Westham and Southlands in the vicinity of Weymouth, northern Swanage and New Swanage, the region between Poole and Bournemouth and in residential areas east of Christchurch. In these instances the areas were not notable for standing archaeology which drew attention from antiquarians and were developed prior to modern regimes of archaeological assessment and mitigation. Much of the development in such areas is not yet regarded as 'historic', with features potentially generating HER records, or of an architectural significance to merit designation, although there is arguably a need to review understanding of the significance of such 'seaside suburbs'.

Some such areas, however, do include records for findspots which, even in relatively small numbers, suggest potential for significant archaeological deposits. From the 5–6km of coast centred on Highcliffe at the eastern end of the study area, for example, there are four HER records for Lower Palaeolithic finds deriving from Terrace Gravels; it is clear that in the context of the specific drift geology even this low density indicates significant archaeological potential. The same area, now substantially developed, also presents a number of records for finds extending from the Mesolithic to the Roman period, hinting at extensive past occupation of the former coastal heathland. The similarly-sized stretch of coast around Boscombe, Pokesdown and Southbourne, east of Bournemouth, also densely developed, offers similar indications of a focus of Palaeolithic activity and of later occupation. Even low densities of records can, therefore, hint at the significant archaeological potential of particular areas.

Notable advances in record densities in both rural areas and those now developed could undoubtedly be made through further systematic assessment of documentary sources such as parish tithe surveys and estate maps and records, particularly if informed by a good understanding of the implications of place- and field-names. (Digital copies of tithe maps have been examined for some parishes during the current desk-based project but the accompanying apportionments from which identifications of features might have been made were not available.) Rapid identification surveys across targeted areas would also potentially add significantly to HER record totals.

10 Assessment of threats to coastal historic environment assets

Archaeological remains are a finite and non-renewable resource, highly fragile and vulnerable to damage and destruction. Threats to the coastal historic environment resource can be characterised in two ways:

- 'natural' threats such as coastal change and rising sea-levels;
- anthropogenic threats such as coastal defence schemes; infrastructure works; compensatory measures for habitat loss as a result of natural or anthropogenic change and increased visitor pressure and vandalism due to improved coastal access.

Several stretches along the Dorset coast are subject to coastal erosion exposing archaeological material from varying periods. Lidar is regularly flown to monitor the rate of erosion but there is currently no policy for the reporting and recording of exposed archaeological materials and features, although the need for a coastal archaeological recording protocol is hopefully now beginning to be addressed by MOLA's HLF-funded CITiZAN project.

10.1 Poole and Christchurch Bays PDZ2, PDZ3 and PDZ4

Appendix 6 at the end of this report shows historic environment sites at risk due to NAI in the Poole and Christchurch Bays area, as listed in annexe 3 of the Two Bays SMP (Royal Haskoning 2011). The list contains many findspots listed in the HER as well as Listed Buildings, sites and features, and shows the epoch in which each entry is likely to be affected. However, the list in the SMP does not record all designations.

The coastline of this SMP area, as a whole, is heavily managed with only smaller sections that function naturally. At 25km in total, the defended sections of open coast exceed the length of undefended sections. Such extensive defences obviously have a major influence on coastal processes, at both local level and more widely across the SMP coastline. The combination of groynes and periodic beach recharge aims primarily to maintain beach widths, retain sediment within the cell and to prevent the hard linear structures being undermined. Both harbours are significantly modified with hard structures and management practices and in parts of the estuarine areas they dominate the natural regime, although natural processes remain dominant elsewhere (Royal Haskoning 2011, 3.2).

10.1.1 PDZ2 Christchurch Harbour and Central Poole Bay

This PDZ which extends from the western end of Friars Cliffs through to Flag Head Chine at Poole (and including Christchurch Harbour), covers a distance of some 26km. The preferred approach is to continue to maintain Hengistbury Head as it is the critical location for the overall control of coastal evolution within the SMP area and one of the objectives of SMP 2 is to support management of heritage interests around Hengistbury Head. Consequently, the preferred scenario is 'With Present Management' (WPM) which aims to 'Hold the Line' (HTL) over all sections, with the exception of Hengistbury Head East where the policy would be 'Managed Realignment' (MR) of the frontage with continued controlled erosion of the cliff (Royal Haskoning 2011, 4.1.9, 4.3.6, 4.3.20).

The international archaeological importance of the Hengistbury Head Scheduled Monument (NHLE 1002367) is described at length above in Sections 6.1 and 9.1. Geologically, the promontory comprises easily-eroded, low dipping Eocene sands and clays. Although the Head could still be at risk from extreme weather events, cliff erosion tends to be very limited because of the wide beach created by longshore drift from the beach replenishment schemes at Bournemouth and the Long Groyne (*cf* West 2013).

Fig 10.1 Erosion at Hengistbury Head (© Copyright Phil Champion and licensed for reuse under this Creative Commons Licence).

The coastline around Hengistbury Head was largely stable until 1848 when the natural ironstone boulders (known as 'doggers') were removed from the foreshore. The protection formerly provided by the doggers had to be replaced by the construction of the Long Groyne in 1937. However, localised erosion of the cliffs has continued due to foot traffic and the combined effects of wind and rain. Since the mid nineteenth century nearly half the headland has been lost to the sea (Bournemouth Borough Council 2011).

A review of the coastal processes and associated risk at Hengistbury Head by Bournemouth Borough Council (2009) concluded that it was likely to take an extremely severe storm event in the order of at least 1 in 100 year probability and possibly closer to a 1 in 200 year probability to cause a one-off breach through Double Dykes near Hengistbury Head at the present time.

The Council have since proposed various schemes to stabilise the promontory and these are listed in the 'Hengistbury Head Management Plan' (Bournemouth Borough Council 2011). This states that prevention of the natural process of coastal erosion on the Head is thought be unsustainable, leading to a 'general agreement that natural processes of erosion should be allowed to happen', although this will have an 'inevitable impact on the cliff top archaeological sites' (*ibid*, 27). The management plan provides for 'general maintenance and conservation works' as well as conservation, interpretation and display of the archaeological features and artefacts in a visitors centre to mitigate the impacts caused by erosion and other natural processes (*ibid*, 28).

James Cole (Oxford University) and William Davies and Dominic Barker (Southampton Universities) have carried out repeated topographic surveys in 2011 and 2012 which they have compared with lidar and historic mapping to demonstrate the rate of erosion at the Mesolithic and Palaeolithic sites on Hengistbury Head (Cole, Barker and Davies 2012).

Considerable damage to the groynes and gabions protecting Hengistbury Head occurred in the storms of 2013-2014, although there was little impact on the archaeology of the Head because of the protection they provided (Hengistbury Head Visitors Centre, pers comm). Work is currently being conducted (autumn 2014) to repair these coastal defences (www.visithengistburyhead.co.uk/Whats-happening/News/August-2014/Coastal-Protection-Works-at-Hengistbury-Head.aspx) [accessed 31 October 2014].

10.1.2 PDZ3 Poole Harbour and associated coastline

This PDZ stretches from Flag Chine to Handfast Point covering a distance of some 81.5km. The zone comprises three areas: the whole of Poole Harbour, including its open coastal area; the wide drowned valley of the Harbour; and the upper estuary to the west of the Arne Headland. With the preferred WPM scenario the general policy is 'Hold the Line' with 'Do Nothing' at Lytchett Bay (Managed Retreat in the long term), Limited Intervention in parts of Brownsea Island, Limited Management from Shell Bay to Studland Sandspit and 'No Active Intervention' (NAI) from Handfast Point to the Warren (Royal Haskoning 2011, 4.4.17–8).

In 2011 The National Trust carried out a proactive project to remove failing sea defences on the south side of Brownsea Island and to return the South Shore to its earlier pristine state.

The areas of Poole Bay and the Harbour, and the Isle of Purbeck bays (Durlston, Swanage, and Studland) contain a broad range of historic sites and Scheduled Monuments (SMs), most of which are located immediately adjacent to the shoreline. Those assets behind sections of coast where defences will be maintained will be defended in the long term, but there are also many unscheduled sites of importance that are unprotected, along with areas of archaeological potential; the WWII coastal defence structures at Studland Bay, for example, may be at risk due to erosion of the dune system (Gordon Le Pard, pers comm).

Fig 10.2 Brownsea Castle and associated buildings on the south-east shore of Brownsea Island, close to the entrance to Poole Harbour. The 'No Active Intervention' (NAI) policy for the area means that the features in the complex are noted as 'at risk' (Appendix 6) (Photograph: Graeme Kirkham).

Many Listed Buildings and Conservation Areas within the urban areas will also be protected under the recommended plan. However, the policies of NAI or MR which promote long-term erosion or deposition will invariably impact upon the recorded and unknown historic environment, as the coastal historic environment resource is so extensive. These losses under the recommended long-term plan for this SMP must be recognised, and consideration should be given to an appropriate programme of survey, recording and investigation to record these important sites, and those potential features not yet identified. However, where the policy is NAI, funding for mitigation by record is not automatic, and will not occur 'at strategy or scheme level' because at present there is no scheme as such that directly impacts the monuments.

10.1.3 PDZ4 Swanage (Handfast Point to Durlston Head)

This PDZ covers a distance of approximately 7km and covers the two bays of Swanage and Durlston. Preferred present policy is a mixture of NAI (Handfast Point to Sheps Hollow, Peveril Point to Durlston Wall, Durlston Head to Durlston Cliif Cliff Flats) and minimum 'Hold The Line' (Sheps Hollow to Peveril Point) with 'Limited Intervention' or localised works at Durlston Wall and Pinecliff Walk. In the medium term this could move to a policy of MR and in the long term NAI (Royal Haskoning 2011, 4.5.11-35).

There are a number of Grade I and II Listed Buildings within the zone in addition to a Conservation Area at Swanage. A major enhancement scheme has also been proposed for Swanage seafront to restore and maintain its special and unique historic character. Scheduled Monuments in this area include the group of three barrows on Ballard Down (NHLE 101294), a bowl barrow at the eastern end of Ballard Down (NHLE 101293) and the old prison and pump in Swanage (NHLE 1002727). The entire area from South Haven Point to Durlston Head also falls within one of known 'high archaeological potential', as detailed in the Purbeck District Local Plan. Between Swanage and St Aldhelm's Head there is also massive evidence of post-medieval quarrying, with sites under threat from erosion due to the policy of NAI (Gordon Le Pard, pers comm). This PSA includes Durlston Castle Historic Landscape Registered Park and Garden (NHLE 1001701); Durlston Castle (NHLE 108174) is currently being renovated to house the Jurassic Coast Visitor Centre.

10.2 Durlston Head to Beer Head PSA1 – PSA5

There are a wide range of heritage sites along the coast and many more of these will be protected through the preferred policies than would survive under a 'No Active Intervention' (NAI) policy. Where there may be possible damage or loss to the historic environment, mitigation measures are proposed in SMP2 (Halcrow Group 2011, 41–2). However, if the policy is NAI, then funding for mitigation by record is not automatic, and will not occur 'at strategy or scheme level' because at present there is no scheme, as such, that directly impacts the monuments.

10.2.1 PSA1 Durlston Head to White Nothe

This area is characterised by rocky, cliff-lined shorelines which are designated for their outstanding landscape and geological value. Much of this coast is currently undefended, except for privately-owned defences to protect visitor access points and facilities, such as at Kimmeridge Bay and Lulworth Cove, and erosion risks are generally low due to the resistant nature of these cliffs. The preferred policy is therefore to continue to allow natural development along this coast: NAI (Halcrow Group 2011, 32).

With this plan there is risk of damage or loss through erosion of historical features, in particular there could be potential partial loss of up to five Scheduled Monuments (SMs) due to erosion over the lifetime of SMP2: Alum Works at Kimmeridge Bay (NHLE 1017307), Bowl Barrow on Emmetts Hill, Worth Matravers (NHLE 1017268), Flowers Barrow, a small multivallate hillfort and associated outwork on Rings Hill, East Lulworth (NHLE 1008141), Bindon Hill camp, West Lulworth (NHLE 1002705) and The Warren Field System (NHLE 1018435).

The likely impacts of the preferred SMP policy option on the SMs will be investigated further at strategy or scheme level. Where avoidance of the features from erosion is not possible and where they cannot be preserved *in situ*, mitigation may take the form of excavation and recording (*ibid*, 33). Because these sites are under threat due to a policy of NAI, then this mitigation by excavation and record will have to be funded by someone other than the Environment Agency, who would be responsible if the policy was Managed Realignment, for example.

There could also be permanent loss of small areas of Encombe and Lulworth Castle Registered Parks and Gardens (NHLE 1000429 and 1000720). Mitigation to minimise the adverse impact could include survey and excavation followed by relocation or redesign of the layout of these parks and garden. Again, because the policy is NAI, then funding for mitigation by record is not automatic, and will not occur 'at strategy or scheme level' because at present there is no scheme as such that directly impacts the monuments.

At Kimmeridge Bay, erosion of the shale cliffs is revealing unrecorded structures and features associated with coastal exploitation from the seventeenth to twentieth centuries, including piers and rock-cut docks (Gordon Le Pard, pers comm).

10.2.2 PSA2 White Nothe to Redcliff Point

This section of coast is dominated by clay-rich cliffs, which experience episodic landslide events that can cause tens of metres of retreat as a result of a single event. In places there is a risk of relict landslide complexes becoming reactivated by ongoing cycles of natural erosion removing supporting material from the base of the cliff, which makes management of this coastline more difficult. The continuation of the natural erosion process is integral to the World Heritage and SSSI status of the cliffs. Therefore, the long-term plan is to allow this coastline to remain in its natural state, ceasing to intervene where such natural erosion presently occurs: a policy of 'No Active Intervention' (NAI) (Halcrow Group 2011, 33).

The coast is mainly undefended except for one short stretch of defences at Ringstead and the main issue along this frontage is the continued provision of these defences, which were constructed in the mid-1990s with a 50-year scheme. The plan is to maintain them in the short to medium term for as long as is technically, economically and environmentally sustainable, but the long-term plan is to withdraw defences and move to a policy of NAI (*ibid*, 515).

With this plan some historical features could be damaged or lost to erosion or a landslide event, in particular there is a medium- to long-term risk to the Scheduled medieval fishpond (NHLE 1016724) and settlement (NHLE 1019393) at West Ringstead. The likely impacts of the preferred SMP policy option on the SMs will be investigated further at strategy or scheme level. Where avoidance of features from erosion is not possible and where they cannot be preserved *in situ*, mitigation may take the form of excavation and recording (*ibid*, 33). Because these sites under threat due to a policy of NAI, funding for mitigation by record is not automatic, and will not occur 'at strategy or scheme level' because at present there is no scheme as such that directly impacts the monuments.

10.2.3 PSA3 Redcliff Point to Portland Bill

This is one of the more heavily developed stretches of coastline within the Durlston Head to Rame Head SMP area, incorporating the key service and tourism centre of Weymouth and the Isle of Portland. There are also a number of natural environment designations for both geological and biological interests (Halcrow Group 2011, 33).

A key driver of policy in this area is the continued protection of commercial and social assets which will require the continued defence of the shoreline for much of this area (Hold the Line). However, this will result in coastal squeeze of intertidal habitats and potential for accelerated cliff erosion in adjacent policy units. The plan, therefore, is to

continue to protect built assets but seek more sustainable means of achieving this. That includes some local realignment and possible beach enhancement (Managed Realignment). The latter approach could also result in the beach in this area becoming more valuable as a tourism resource for the wider region. Where realignment does take place, measures will need to be in place to manage this transition in policy. There is also a need to start to plan for how transport links can be provided in the future, especially the long-term future of how the road link to Portland is provided (Halcrow Group 2011, 33).

Along the north-western shore of Portland Harbour it is unlikely to be appropriate to intervene along the entire stretch of coast, at least in the short to medium term. With some risks to property and critical infrastructure along parts of this shoreline, this policy would require measures to be to be put in place to manage the relocation of people and property in the longer-term (Managed Realignment) (Halcrow Group 2011, 33).

The Isle of Portland and Portland Harbour breakwaters are key controls on future evolution as they provide shelter and influence the movement of sediment. This whole stretch of coast is therefore heavily dependent on any changes to Portland Harbour breakwaters. The preferred plan includes the assumption that the breakwaters will remain and be maintained (Hold the Line), and buildings along the breakwaters will be protected. However, even if this assumption were not to hold true in the future, sensitivity tests suggest that it would not alter the preferred management approach, only the nature and timing of how it is implemented (Halcrow Group 2011, 33).

The current plan involves protection of Nothe Fort, Tram and Searchlight (NHLE 1002063) at The Nothe, Weymouth, and of Portland Castle (NHLE 1205262, LB 1015326) and Sandsfoot Castle (NHLE 1020062) from flooding or erosion. Where heritage assets are protected, opportunities should be sought at scheme level to improve the condition of the sites, where appropriate.

The plan assumes the potential loss from erosion of a small area of Mesolithic sites near Culver Well (NHLE 1002406). Where avoidance of erosion of the features is not possible and where they cannot be preserved *in situ*, mitigation should take the form of excavation and recording. However, because these sites are under threat due to a policy of NAI, funding for mitigation by record is not automatic, and will not occur 'at strategy or scheme level' because at present there is no scheme as such that directly impacts the monuments.

10.2.4 PSA4 Portland Bill to Thorncombe Beacon

This stretch of coast is dominated by Chesil Beach, which as well as being internationally important for its habitats, geomorphology and landscape characteristics, also provides an important defence role. The shingle barrier is undergoing a natural change as it rolls landwards in response to sea level-rise and experiences natural reduction in sediment inputs from further west. Whilst this natural process is integral to the designated status of Chesil Beach, where it fronts the tidal lagoon of The Fleet there are environmental implications as The Fleet is gradually being naturally 'squeezed'. This may result in changes to the interest features of the area. As this process occurs, there will also be a significant flood risk to the road and other assets that run behind the beach towards Portland at the eastern end of this section (Halcrow Group 2011, 33–4).

Other conflicts arise where there are small settlements, as this coast is also important for tourism which relies on access to the beach and the provision of facilities. As the ridge naturally rolls landward, sustaining defences along these stretches will become more difficult (Halcrow Group 2011, 34).

A key driver of policy is to maintain the natural status of Chesil Beach and take measures to ensure its future sustainability. Therefore, for most of this stretch no intervention is planned (NAI) (Halcrow Group 2011, 34).

In the very long term this could have implications for how transport links to Portland are provided and consideration of how this link can be provided in the future is required. Elsewhere this plan would have some implications for several cliff-top properties and beachfront facilities, which would need to be relocated (Managed Realignment) (Halcrow Group 2011, 34).

At Freshwater Beach, the plan is adapted to allow some minimal intervention to manage the realignment of the coast in line with the retreat of adjacent undefended cliffs (Managed Realignment). This approach, supported by construction of a secondary defence further inland, will reduce local flood risk to properties at Burton Bradstock without compromising natural functioning of the beach. Continued defence of West Bay will also require a secondary defence behind East Beach to enable sustainable long-term management of flood risk to be achieved, while also allowing more natural functioning of the beach (Halcrow Group 2011, 34).

At the far eastern end of Chesil Beach (Chiswell), the long-term plan is to continue to maintain existing defences (Hold the Line). This is not expected to have a detrimental impact on the Chesil Beach system as a whole, although locally rollback will be inhibited. However, this management is required to maintain protection to assets along this shoreline so that the risk of flooding continues to be reduced (Halcrow Group 2011, 34).

Chesil Beach experienced massive change due to the storms of early 2014: estimates put the extent of crest recession at between 7m and 9m, with a lot of that material being drawn offshore (R Edmonds, pers comm). At West Bexington, beds of pebbles and mud exposed in the beach have been interpreted as over-wash storm events from a time when the beach was much more seaward than its present position. Part of a possible WWII wreck was exposed, but that is now buried again. Coastal erosion between Abbotsbury and West Bay is threatening sites of various dates, in particular elements of the WWII coastal defence complex at Abbotsbury (Gordon Le Pard, pers comm) (Fig 9.1).

10.2.5 PSA5 Thorncombe Beacon to Beer Head

The coast between Thorncombe Beacon and Lyme Regis is subject to a large degree of coastal erosion which puts the historic environment at risk. This section of coast is characterised by dramatic, geologically important cliffs which are subject to large-scale complex landsliding. These events are difficult to predict with any certainty, making management of this shoreline difficult. Sediment interlinkages along this frontage are relatively weak due to the interruptions caused by headlands (Halcrow Group 2011, 34).

The nature of the erosion of these cliffs is integral to their designations and landscape value; however, the area is also important for tourism, with resorts at Seatown, Charmouth and Lyme Regis heavily dependent upon this. A key driver of policy is therefore to allow the continuation of natural coastline evolution (NAI) whilst managing the risk of erosion and flooding to the key settlements (Hold the Line/ Managed Realignment) (Halcrow Group 2011, 34).

The defence of Seatown will become increasingly difficult and expensive in the long term. Therefore the long-term vision is for a more naturally functioning coast. This would, however, result in the potential loss of some assets. Measures will therefore need to be put into place to manage this transition from existing practice (Managed Realignment). In the long term the shoreline should reach a more sustainable position, such that a beach will be retained (Halcrow Group 2011, 34).

At Charmouth and the eastern side of Lyme Regis, there is a need to address the increasing risk of further recession of the landslide complexes causing outflanking or even loss of the presently defended areas (Managed Realignment) (Halcrow Group 2011, 34).

The risk in these areas may be managed in the short to medium term through either maintenance of existing defences or, in the case of Lyme Regis, construction of the Lyme Regis Environmental Improvements Phase IV scheme (Hold the Line).

https://www.dorsetforyou.com/lyme

However, the long-term defence of these areas will be determined by the extent and location of future cliff recession and so it may be necessary to consider measures to enable assets to be relocated away from the areas at risk (Managed Realignment). This would be based on continual monitoring (Halcrow Group 2011, 34–5).

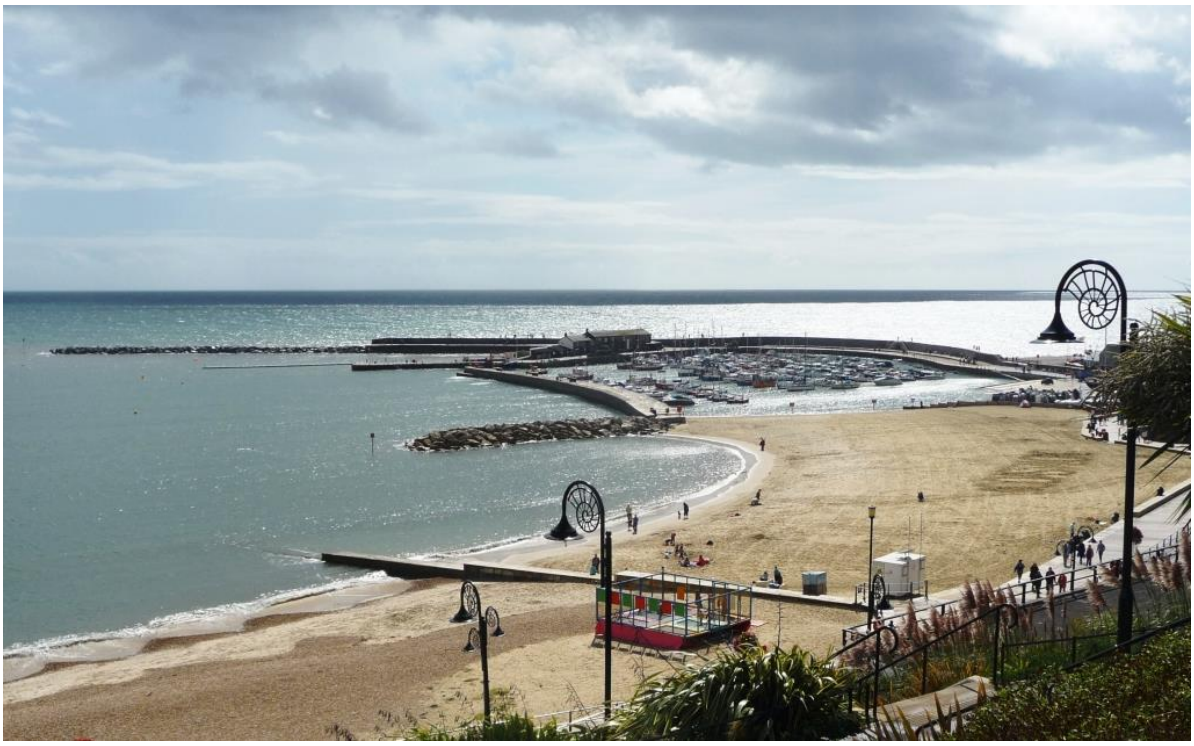

Fig 10.3 Historic and more recent structures make up the complex around the Cobb, Lyme Regis (Photograph: Ben Williamson).

Monmouth Beach, which lies to the immediate western side of the Grade I Listed Cobb piers and walls at Lyme Regis (NHLE 1229437), presents a potential flood risk to the commercial and tourist centre of Lyme Regis. No formal defences for the beach exist and the current short-term (to 2025) management regime for the beach is 'Do Nothing'. The beach is protected in part by the existing structures, which include the Cobb. The medium-term management proposals (to 2055) are to construct a more formal defence as part of Managed Realignment and then maintain this defence in the long term (to 2105). Monmouth Beach and its protecting structures are monitored to inform these future management decisions (Halcrow Group 2011, 35).

Managed Realignment represents a long-term, if as yet undefined, risk to the historic Cobb and related structures, as they may be altered to mitigate the long-term risk to Lyme Regis. Set in the historic context, however, this would be an another phase of their historic development; if managed correctly, however, such work may reveal more about this monument as recent alterations have shown (Wilson *et al* 2007). However, large-scale coastal defence work in areas around Lyme Regis has buried several archaeological features without any recording.

Ware Fields, just west of Lyme Regis, is experiencing a major reactivation of the ancient landslides, which has destroyed a holiday home there. The old railway line on the beach is largely buried but is also being battered by the sea; this was the track created in 1888 to export limestone from the cliffs (Richard Edmonds, pers comm).

Erosion also risks potential partial loss of the Scheduled group of four bowl barrows on Golden Cap (NHLE 1016373). Because the policy for this area is NAI, funding for mitigation by record is not automatic, and will not occur 'at strategy or scheme level' because at present there is no scheme as such that directly impacts the monuments.

Other potential threats in this area include flood and erosion risk to Grade I, Grade II* and Grade II Listed Buildings (Halcrow Group 2011, appendix I).

10.3 Medium- to long-term risk to historic harbour works posed by unintended use as flood and erosion protection works

The two Shoreline Management Plans for the Dorset coast, SMP1 Poole and Christchurch Bays and SMP2 South Devon and Dorset, indicate that the historic harbour works listed below are acting as unintended flood and erosion protection works and may be impacted by coastal defence works in the short (to 2025), medium (to 2055) or long term (to 2105).

10.3.1 Poole Harbour Training Bank

This was constructed between 1928 and 1934 from a rock dump of limestone blocks to direct the flow of tidal currents to maintain a navigable approach to Poole Harbour. The Training Bank is not designated as a heritage asset. Poole Harbour Commissioners' Engineering Department advise that the structure has not required maintenance in living memory and they see no reason for any work to be required on it in the foreseeable future. As far as can be ascertained it has never required maintenance since its construction.

10.3.2 Weymouth Promenade

The town and port of Weymouth are strategically significant. The entrance to the harbour is completely artificial and defended to the west by a sea wall and promenade, (Weymouth Esplanade), constructed some 100 years ago. In the long term the management regime is 'Hold the Line', which would see these structures upgraded in the short to medium term to allow the management regime to remain effective in the long term. Neither seawall nor Esplanade are designated as heritage assets (Halcrow Group 2011, 78-83).

10.3.3 Portland Harbour breakwaters

These substantial structures consist of a rock dump of limestone blocks built between 1844 and 1872. Measuring more than 5.5km in length, they are up to 77m wide and 15m deep and consist of four breakwaters separated by two ship channels. From south to north the breakwaters are named the Inner Breakwater (which adjoins Portland), the Outer Breakwater, the North-eastern Breakwater and Bincleaves Groyne, which joins the mainland. They provide coastal protection from Redcliff Point to King's Pier across four Policy Units, including the important town of Weymouth and Portland Harbour. The Inner and Outer Breakwaters are Grade II Listed structures, as is the Portland Breakwater Fort which is situated at the southern end of the Outer Breakwater. The management regime is 'Hold the Line' through to the long-term, which requires these breakwaters to remain and be maintained (Halcrow Group 2011, 69-99).

10.3.4 West Bay piers

During the post-1740 harbour construction works at West Bay two timber piers were built to enclose the harbour entrance. These were rebuilt as stone structures in 1865. In the twenty-first century the West Pier was replaced and the East Pier rebuilt.

https://www.dorsetforyou.com/408534

In the short to medium term these structures will need to be maintained to facilitate the 'Hold the Line' management regime which in the medium to long term will become a regime of 'Managed Realignment'; this may require these structures to be upgraded

and possibly rebuilt. The piers are not designated as heritage assets. The piers appear to be largely modern in structure, although the East Pier does contain elements of the 1865 stone structure (Halcrow Group 2011, 131-37).

10.3.5 The Cobb, Lyme Regis

The historic Cobb at Lyme Regis has an important influence on the beaches to both its east and west. The long-term management regime for Lyme Regis sea frontage is 'Hold the Line' for the areas east of the Cobb. Monmouth Beach, which lies to the immediate western side of the Cobb is a potential flood risk to Lyme Regis and currently has no formal defences. The current short-term management regime for the beach is 'Do Nothing.' The medium-term management proposals are to construct a more formal defence as part of 'Managed Realignment' and then 'Hold the Line' in the long term. As part of these management regimes the Cobb is monitored to inform these future management decisions (Halcrow Group 2011, 166-73). This represents a long-term, if as yet undefined, risk to the historic Cobb, as it may be altered to mitigate the long-term risk to Lyme Regis. Set in its historic context, however, this would be an another phase of its historic development which, if managed correctly, and as recent alterations have shown, may reveal more about its past development (Wilson *et al* 2007, 86).

The Cobb is a Grade I Listed structure. It was damaged in storms in February 2014 and repairs were completed in October 2014:

www.bridportnews.co.uk/news/11554793.Repairs_to_Cobb_completed_after_storms/

There is a staged programme of coast protection works taking place at Lyme Regis. Phase I was completed in 1995, Phase II began in spring 2005 and was completed in 2007 to protect the area from Cobb Gate to the harbour from landslides and coastal erosion, funding has been secured for the Phase IV scheme is a multi-million pound project to protect homes, roads and infrastructure from the effects of coastal erosion in Lyme Regis. It is intended that the works will secure around 390 metres of coastline between Church Cliff and East Cliff for the next 50 years:

https://www.dorsetforyou.com/lyme

11 Further work

11.1 Research priorities and themes

In this section research priorities and themes identified by the DBA are presented in the context of the regional themes and research aims set out in the South West Archaeological Research Framework (SWARF) (Webster 2008).

11.1.1 Prehistoric and Roman

SWARF Research Theme: Methodology — Hidden Resources

SWARF Research Aim 4: Encourage wide involvement in archaeological research and present modern accounts of the past to the public.

'Many of the archaeological resources of the region lie not in the ground but in the stores of museums, archive offices, contracting units, individuals and HERs. Study of these records and artefacts can be far more cost-effective than excavation or other fieldwork' (Webster 2008, 271).

It has been noted that far more Palaeolithic and Mesolithic material has been recovered from the Dorset coast than has been recorded to date in the HER (Wessex Archaeology 2007, 18). This material appears to comprise both flint and greensand chert tools and derives from *in situ* contexts, possibly primary, that are subject to cliff erosion. The number of find spots / sites may be in the order of up to ten times greater than that currently recorded (*ibid*). The material appears to be in private hands and its publication is uncertain. It is important to locate and record these sites and finds and to enhance the HER.

SWARF Research Aim 23: Improve our understanding of past climate and sea level changes together with their effects on people's relationships with landscapes and the sea.

Poole Harbour, Christchurch Harbour and the Fleet lagoon are key areas for study of past environmental change and its effects on human activity. Changes in relative sea-level have influenced the deposition of floodplain material likely to overlie Pleistocene deposits and contain a range of indicators of climatic change (Wessex Archaeology 2004a, 6).

A key issue in Dorset, as elsewhere, is the use of coastal zones during the Mesolithic, since most of this evidence has been lost to rising sea levels (Hosfield *et al* 2008, 49). It would be valuable to identify more Mesolithic occupation sites like Hengistbury Head (Barton 1992) and Culver Well (Palmer 1990); the areas with the greatest potential are likely to be around Lulworth, the Fleet, Weymouth, Portland and Bournemouth (Wymer 1977, 67–77; Hosfield *et al* 2008, 58).

During the Iron Age and Romano-British periods settlement appears to have been associated with the coastal zone and the rise in significance of Poole and Christchurch Harbours. Research is required to identify the evolution of settlement and other land-use patterns in conjunction with sea-level rise and the accessibility of coastal resources and maritime exploitation (*cf* Wessex Archaeology 2004a, 8).

The 2004 Dorset RCZAS emphasised the need for 'systematic study of reclamation and seawall construction' from at least the medieval period onwards (Wessex Archaeology 2004a, 14). This could encompass reclamation and development in Poole Harbour and development of the breakwaters at Lyme Regis, Poole, Weymouth and Portland.

SWARF Research Aim 10: Address our lack of understanding of key transitional features

Establishing the origins of field systems has been identified as a key research objective in SWARF and further research should be undertaken on the origins of the coastal 'Celtic' field systems of Dorset as well as the development of rectilinear territories

extending inland from the coast such as those in the Christchurch area, south-east Purbeck and around Abbotsbury / Portesham.

SWARF Research Aim 54: Widen our understanding of monumentality in the Neolithic and Early Bronze Age

There are many examples of early ceremonial landscapes along Dorset's coastline. The spectacular upland locations of barrow cemeteries at Nine Barrow Down, Purbeck, and above Chaldon Herring ('Five Marys') make these sites ideal subjects for cognitive landscape studies which could be combined with reconstructions of the contemporary coastline (Wessex Archaeology 2004a, 16).

SWARF Research Aim 29: Improve our understanding of non–villa Roman rural settlement

West Dorset currently has very little evidence for settlement in the Roman period. A cross-section of the 974 sites Iron Age or Roman date sites identified by the NMP component for this project (Royall 2013) should be verified by field visits, possibly followed by survey, characterisation and targeted excavation to test whether this is a reflection of a real absence or only a lack of previous archaeological work.

It would also be rewarding to look at later prehistoric, Roman and early medieval settlement in the wider coastal zone, with an emphasis on industry: salt making, working Kimmeridge shale and quarrying. The map and table in '*Romano-British industries in Purbeck*' (Sunter and Woodward 1987, 7) gives an idea of the scale of such involvement known in 1987, but much work has taken place since and there is the rest of the Dorset coast beyond Purbeck to consider. There is potential for exploring how industry and agriculture were integrated on a landscape scale. Did the addition of industry mean that settlement could be denser because more people could be supported? What happened to 'industrial' settlements after *c* 400 AD? Much evidence for past activity in the coastal zone must have been lost to erosion, but such a study would also assess what is now at risk and make estimates of the time frame for further loss. Such research would also have considerable potential for community involvement, including fieldwalking, targeted test-pitting to date undated sites and finds processing *(SWARF Research Aim 4: Encourage wide involvement in archaeological research and present modern accounts of the past to the public)*.

SWARF Research Aim 46: Assess the information for Roman ports

Roman ports are poorly known in Britain, yet the wider South West region has many potential sites, both on the Channel coast (Hamworthy, Seaton, Topsham, Plymouth) and on the banks of the Bristol Channel (Oldbury-on-Severn, Sea Mills, Clevedon, Crandon Bridge, Combwich and the Camel estuary). Despite the obvious importance of the sea in the region, very few of these sites have been studied. Work on sea-level change may also be of value in understanding the Roman coastline. There has been some work on this topic in Poole Harbour but little elsewhere (Webster 2008, 291).

SWARF Research Aim 38: Widen our understanding of the extraction, processing and transportation of minerals, stone and aggregates

Evidence for Iron Age, Romano-British and medieval salt production on low-lying ground in Dorset is well-documented but no synthesis has been carried out since Farrar (1975) and Keen (1988). Further fieldwork to identify salt production sites in the intertidal zone is recommended and a holistic study of the salt producing industry in Dorset detailing the development and addressing evidence from recent discoveries and research is required (*cf* Wessex Archaeology 2004a, 21–2).

11.1.2 Early medieval and medieval

SWARF Research Aim 33: Widen our understanding of the origins of villages

The transition from the early medieval period to the pre-Conquest period is one of the main research areas for rural settlement studies in the South West. The origin of

villages and their field systems in some areas (notably in the east of the region), is thought to date from the tenth century but further detailed investigation, analysis and dating is urgently needed. Further work needs to be addressed by wider landscape studies and the careful targeting of fieldwork/excavation. There is a particular need to explore the origins and development of landscapes characterised by dispersed settlement patterns in the west of the region (Webster 2008, 287).

With the exception of Wareham and Bridport, early medieval settlement is poorly understood in Dorset. There are only 68 early medieval sites, 31 early medieval / medieval sites and six early medieval to post-medieval sites recorded in the HER.

Many medieval deserted villages on the Dorset coast were located to some extent by the 1970 RCHME survey but merit further investigation.

SWARF Research Aim 3: Address apparent "gaps" in our knowledge and assess whether they are meaningful or simply biases in current knowledge

There is a very marked bias in the amount of fieldwork and synthesis in the medieval and later periods across the region; Cornwall and Somerset have been well-served but Dorset and Wiltshire are in particular need of synthetic treatment (Webster 2008, 277).

SWARF Research Aim 47: Assess the archaeological potential for studying medieval economy, trade, technology and production

A review of historical and archaeological evidence for Dorset's fishing industry in the medieval and later periods would help in understanding the importance of this industry (*cf* Wessex Archaeology 2004a, 20).

11.1.3 Post-medieval and modern

SWARF Research Aim 36: Improve our understanding of medieval and later urbanism

There is considerable potential for research into the development of coastal settlement landscapes based on leisure and amenity in the late nineteenth and twentieth centuries. Much of the housing at places like West Bay, south of Swanage or the coast west of Bournemouth came between the Wars; Sandbanks did not exist as a settlement until the twentieth century and is now primarily known for its extremely expensive real estate. The period is characterised, among other components, by the development of distinctive landscapes and architectures, with large detached villas in grounds, coastal hotels, bungalow estates, new road networks opening up new areas, amenity planting on former coastal heaths, infilling, crescents, closes, cul-de-sacs, pleasure gardens, promenades, coastal walks, cliff steps and zig-zag paths, shelters, seats, public leisure facilities like tennis courts and bowling greens, bandstands and public conveniences. Much of the development was probably the product of small-scale speculative activity but some also of individuals buying plots to put up 'dream homes'. Much of the municipal provision was shaped by coherent visions of the form and ethos of new settlements. There is potential for a characterisation project and study of significance based on assessment of these 'new' post-medieval and modern landscapes and architectures to increase understanding and underpin appropriate management and protection.

SWARF Research Aim 45: Broaden our understanding of post medieval to modern technology and production

Dorset's coastal alum mines and works evidently made use of pyrites mined from Eocene surface deposits or collected from littoral deposits washed out by marine erosion and processed locally, while the Kimmeridge alum works used shale. Alum and copperas mines on Brownsea Island are recorded from 1586 (Papworth 1992) while additional works are known in Kimmeridge. Allen *et al* (2001) suggest that the copperas industry was one of the first major inorganic chemical industries established in England and played an important role in the industrialisation of the national economy

from the late sixteenth to the late eighteenth century. The principal use of copperas was as a textile dye mordant and saddening agent and it is therefore closely linked with Dorset's woollen industry.

Archaeological investigations have been carried out by the Dorset Alum and Copperas project on behalf of the Poole Harbour Heritage Project on the south shore of Brownsea Island (Bellamy *et al,* forthcoming a), Kimmeridge Bay (Bellamy *et al,* forthcoming b) and the Studland Circles (Bellamy *et al,* forthcoming c), but a comprehensive history of Dorset's alum and copperas industry has yet to be compiled (*cf* Wessex Archaeology 2004a, 22).

The mapping for the RCZAS DBA has shown that there are very substantial numbers of gravel, sand, ball clay and clay pits in the area west of Poole Harbour (*cf* Buxton 2010; Cousins 2010) and on Brownsea Island; Bestwall Quarry is the successor to these. Some of these sites had very early tramways associated with them and a number were used for brick and pottery making. Research is needed on what evidence now remains of what was once a very substantial industry to assess significance, the degree to which it is at risk, and the priorities for recording.

11.1.4 Maritime

SWARF Research Aim 2: Encourage works of synthesis within and across periods, settlements, monuments and areas

The potential exists for archaeological evidence of maritime sites of all periods from the Mesolithic to the present day to be recoverable from along the Dorset cast and inshore waters. Maritime sites consist of either vessels (wrecks) or debris accidentally or deliberately lost overboard from a vessel (Wessex Archaeology 2007, 23).

This potential cannot be reliably quantified at the present time, although it is reasonable to expect it to be related to the number of vessel movements during any particular period, the length of time that the evidence is likely to survive and the likelihood of the evidence being discovered. The potential for evidence of maritime activity from the post-medieval and modern periods can be expected to be greatest because of the increasing volume of trade and other marine activities in the area during these periods, and because of the relatively short period of time since its deposition on the seabed. Potential for the survival of evidence of medieval or earlier date is likely to be low, although certain classes of evidence, such as stone ballast and cargoes of inorganic materials (pottery and metalwork), can be expected to survive for very long periods and the survival of more vulnerable organic material can occur in the right circumstances (*ibid)*.

Wessex Archaeology (2004a, 14) noted that naval activity, including purely marine sites, has been neglected from assessments of Dorset's military heritage. Evidence for such activity is biased towards WWI and WWII, and a synthesis of documentary sources and archaeological remains for earlier periods is required, including naval activity during times of peace.

11.2 Identification of specific sites and areas that would benefit from further research or fieldwork

11.2.1 Scheduled Monuments threatened by coastal erosion

Assessment of the condition and likely impacts of SMP policy is recommended for the following Scheduled Monuments threatened by coastal erosion: the Mesolithic site at Culver Well on the Isle of Portland (NHLE 1002406); Alum Works at Kimmeridge Bay (NHLE 1017307), Bowl Barrow on Emmetts Hill, Worth Matravers (NHLE 1017267), Flowers Barrow, a small multivallate hillfort and associated outwork on Rings Hill, East Lulworth (NHLE 1008141), Bindon Hill camp, West Lulworth (NHLE 1002705) and The Warren Field System (NHLE 1018435). It is possible that these sites cannot be preserved *in situ* and excavation and recording may be required.

The sea continues to cut into the cliffs of the Golden Cap Estate. The condition of sites such as Golden Cap (NHLE 1016373) and Thorncombe Beacon (NHLE 1106101) should be assessed and recommendations made for monitoring and further recording if appropriate. Other, non-designated sites further west are also worthy of investigation; for example, occasional Iron Age and Romano-British sherds have been found eroding from the cliffs from Ridge Water (SY 3910 9235) to St Gabriel's Water (SY 3970 9235) (Papworth 2013).

11.2.2 Registered Parks and Gardens threatened by coastal erosion

Surveys and excavations should be carried out on the small areas of the Registered Parks and Gardens at Encombe (NHLE 1000429) and Lulworth Castle (NHLE 1000720) which are threatened by coastal erosion.

11.2.3 New sites identified by the DBA

The nine new prehistoric to medieval sites identified by the DBA, which include three possible Early Bronze Age barrows, should be should be verified by field visits and survey if appropriate. There are three possible Early Bronze Age barrows, the site of an Iron Age storage pit, a Roman-period midden, a possible medieval rabbit warren and a medieval or post-medieval strip lynchet, mill and battery.

11.2.4 Rapid identification surveys in areas of low record density

Rapid identification surveys across targeted areas of low record density could significantly enhance the HER. These surveys should include the rural area between Charmouth and Golden Cap, the coastal zone between West Bay and Burton Bradstock, the vicinity of Redcliff Point, the area to the west of Lulworth Cove and the 'strip territories' in the south-eastern portion of the Isle of Purbeck which are extensive but generate relatively few HER points.

11.2.5 Peat in Poole Harbour and along the Dorset coast

Several developer-led interventions in Poole Harbour have recorded peat layers in boreholes (Wessex Archaeology 2004b; Giffords 2004; Ramboll 2014). These results could be collated to create a deposit model to identify the character, extent and degree of survival of peat deposits in the Harbour. A database of GIS shapefiles could be produced with accompanying narrative to record the areas of known or potential peat deposits identified by deposit modelling. This would allow the GIS to be used to analyse and display the identified areas according to one or more variables such as Period, Site Type, etc. The results of the spatial and data analysis would in turn allow users to identify areas for further research or particularly good examples of peat preservation.

Poole Harbour is an ideal location for historic fish traps; none have been recorded to date and identification and recording of likely structures would be a significant research gain.

The Fleet lagoon behind Chesil Beach is an area where a sheltered shoreline would have enabled access to coastal resources, lending itself to early human occupation. Large blocks of peat have washed up on Chesil Beach during storms, including sizeable pieces of tree trunks dated to the late Mesolithic or Early Neolithic (Carr and Blackley 1976; Le Pard 2001). Large amounts of peat have also been identified within the Fleet, with the remains of beaver suggesting that the area was fresh water at the time of these deposits (Le Pard 2001). Peat dating to the Mesolithic has also been noted at the mouth of Poole Harbour (Timothy Darvill, pers comm). The preservation of peat and the potential for survival of submerged landscapes presents possible opportunities for landscape reconstruction, documenting the climate and vegetational history of the Holocene and the recovery of Mesolithic and Neolithic archaeological material (*cf* Maritime Archaeology 2007, 68).

11.2.6 Submerged forests

Submerged forests of early or mid-Holocene date have been noted offshore from both Bournemouth and Charmouth (Delair 2000; Gordon le Pard, pers comm). There are also reports of a submerged forest near West Bay (Hinchcliffe and Hinchcliffe, 1999; Gordon Le Pard, pers comm). The extent and condition of these sites are unknown. The majority of such forests are below the low water mark and only visible at extremely low tides, but elements may exist under current beaches and coastal defences: Mate and Riddle (1910, 5) reported that at Bournemouth, in making excavations for the West Undercliff Promenade in 1910, 'the contractor had to cut through a complete section of the forest bed. It was eight feet in thickness, with trees in situ, imposed upon a strata [sic] of gravel and sand'. The submerged sites could be investigated by divers to assess potential for palaeoenvironmental sampling and mapped by sidescan sonar using the techniques developed by the Lyonesse Project in the Isles of Scilly (Charman *et al,* in preparation).

11.2.7 The Green Island complex

The Green Island complex is a large Iron Age settlement which is home to the oldest known port structure in northern Europe (MWX 457510); several surveys have been completed on the complex, notably as part of the Wytch Farm oil field development (Cox and Hearne 1991) but also through work by Bournemouth University (Wilkes 2001; 2010a) and a Time Team evaluation (Wessex Archaeology 2003). The area is not Scheduled despite its importance. A review of existing survey data is recommended with associated test-pitting to ground-truth the survey findings.

11.2.8 Settlement and coastal activity

A sample of the 974 sites identified and assigned an Iron Age, prehistoric / Roman or Roman date by the NMP component of this project (Royall 2013) should be verified by field survey, characterisation and targeted excavation, to improve understanding of coastal settlement at this period, particularly in areas where current information is relatively poor such as west Dorset.

It would also be rewarding to review later prehistoric, Roman and early medieval settlement and industry in the wider coastal zone, as discussed above in section 11.1.1.

Further investigation of deserted medieval settlements identified by past RCHME (1970) investigation and by the RCZAS DBA is recommended, in the first instance field visits and survey.

11.2.9 Historic use of coastal promontories

Various promontories along the coast have been used to site ceremonial monuments, for occupation and coastal defence and as signal stations or hazard warnings; Thorncombe Beacon is a good example. An overview landscape project detailing the history, use and development of these promontories would help to build up a picture of the changing uses of the coast which could be extended to cover the whole south coast region.

11.2.10 Rectilinear strip territories

Further research should be undertaken on the origins and development of the rectilinear coastal field systems of Dorset, such as those in Christchurch area, south-east Purbeck and around Abbotsbury / Portesham, in the light of recent developments in historic landscape studies, not least the recognition of apparently comparable systems of landscape division elsewhere in southern Britain (for example, the north coast of West Penwith, Cornwall: Dudley 2011, fig 43).

11.2.11 Coastal industry, quarrying and quays

An assessment is required of the full range of historic quarrying and industrial activity on the Dorset coast, in particular at Portland, Purbeck and Kimmeridge Bay, and in urban centres such as Poole and Weymouth. Identification and recording of sites at threat from coastal erosion should be prioritised; for example, the extensive post-medieval quarries between Swanage and St Aldhelm's Head and the unrecorded or poorly recorded structures and features associated with post-medieval and modern exploitation of the shale cliffs at Kimmeridge Bay.

Poole Harbour has several quays which are now abandoned along the western side; these are thought to be part of the clay trade from Purbeck and would benefit from further survey and recording work to ascertain their nature. These include Redhorn Quay in Brands Bay, where the remains of a possible sixteenth-century Portland stone quay and wooden stakes have been noted, and Brands Quay, shown on the 1811 Ordnance Survey map with further developments shown on the 1889 Ordnance Survey 25in: 1 mile map. Russel Quay (Le Pard 2003) and Ower Quay (Jarvis 2014) have already been investigated.

The harbour structure of *c* 1660 at Clarendon Rocks on Hengistbury Head should be appropriately recorded.

11.2.12 Military facilities on Portland

Portland contains a high concentration of interesting and potentially important former military facilities, many of which have been decommissioned, and whilst some have already been redeveloped or removed, many others await redevelopment; for example, Portland's naval hospital. It is highly likely that several of the sites are important in terms of understanding Britain's military development in the twentieth century, not least during the Cold War; for example, the development of torpedoes. However, at present there is no over-arching study. There is also considerable potential for involving the local community and businesses in a landscape-based assessment which could identify areas and sites to improve amenity and education opportunities.

The Rotor early warning radar station at RAF Portland (NHLE 1021302) is on EH's Heritage at Risk Register and preparation of a conservation management plan for this site should be considered.

11.2.13 WWII defences at Studland Bay and Abbotsbury

Erosion of the Studland dune system may be threatening WWII structures at Studland Bay (PDZ3), where a Type 25 pillbox has eroded from the cliffs at Redend Point (Foot 2006, 69), and coastal retreat is also threatening WWII defences at Abbotsbury (PSA4) (Fig 9.1). The condition of sites in these areas should be reviewed and recorded photographically. The results should be presented in a stand-alone report with recommendations for future management.

The present survival and condition of the numerous WWII sites identified by the NMP projects along Chesil Beach and east of Weymouth should also be assessed. The majority were recorded as extant structures on post-war air photographs, but it is not known how many survive or in what condition.

11.2.14 Late nineteenth- and twentieth-century leisure and amenity development

Research into the development of coastal settlement landscapes based on leisure and amenity in the late nineteenth and twentieth centuries is recommended (outlined above in section 11.1.3), for example at West Bay, in the area between Swanage and Durlston Head (partly designated as the Durlston Castle Historic Landscape: NHLE 1001701) and in the area of former coastal heathlands around Sandbanks, Bournemouth and Christchurch. This project would potentially have useful interfaces with the English Seafront project (see above, section 2.4.6).

11.2.15 Investigation of maritime findspots

There are several sites where prehistoric archaeological remains or finds have been found or reported by divers; the areas around these sites could benefit from further survey and research. For example:

1. A Bronze Age winged axe and ferrules found in the entrance to Poole Harbour; other items were sighted nearby at the time but nothing else was recovered (Needham *et al* 2013).
2. The Poole Logboat was raised and recovered in 1964 (Peers 1964; Markey *et al* 2002); new survey work in the area where the log boat was found may reveal further details of the vessel.
3. A log boat is marked in the Dorset HER (MWX4629) as having been found [near] the South Causeway, between Wareham and Stoborough, in the nineteenth century; however, nothing else is known about this vessel.
4. A Roman amphora found in Weymouth Harbour may be indicative of the site of a wreck (MDO6652).

11.2.16 Hulks in Holes and Lytchett Bays, Poole Harbour

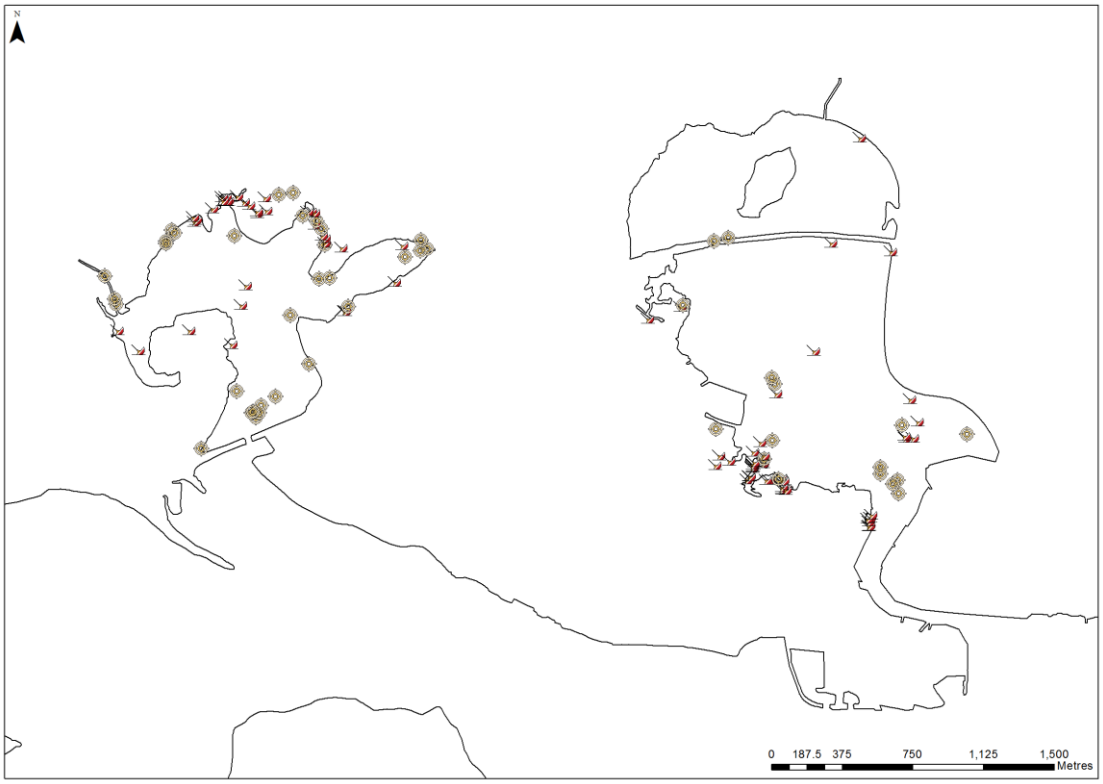

Fig 11.1 Hulks in Holes (right) and Lytchett Bays, Poole Harbour, identified by Bournemouth University (map based on unpublished research by Tom Cousins).

A 2011 report on hulk assemblages noted 22 hulks dating from the 1950s recorded in the HER in Holes Bay, Poole Harbour, and recommended further survey work to ascertain the types of hulks present (Davies 2011, 20). Bournemouth University has identified at least 46 hulks and wrecks within the area of Holes Bay, ranging from large vessels, 24m in length, to small local fishing craft (Fig 11.1). Of these, several were recorded to at least I*f*A Level 1 (Institute for Archaeologists 2013) as part of a student training program in 2007. In addition to this, at least 48 potential hulks have been noted in neighbouring Lytchett Bay; these appear to be mainly small fishing craft but are yet to be surveyed. It should be noted that the intertidal zone is a dangerous area

to work in and it may require specialist equipment in order to survey some of the hulks and wrecks in this area.

11.2.17 Wrecks

Assessment is required of wrecks which are over 100 years old and therefore defined as Underwater Cultural Heritage under the UNESCO 'Convention on the Protection of the Underwater Cultural Heritage' (2001). The Dorset HER lists 825 'wrecks' constructed before 1920; however, many of these are events given general locations such as 'near Poole' with no actual wreck existing. A separate category for 'potential wrecks' should be created to avoid confusion.

The following are known wreck sites in the study area (HER and NRHE data, with additional details from Tom Cousins):

1. *De Hoop*, various items have been recovered from Chesil Beach which have been ascribed to this wreck, lost in 1749, although their provenance has not been proven (MWX2686). Numerous other pre-1900 wrecks occurred along Chesil Beach from which timbers and artefacts could wash on shore.
2. *Halsewell*, a British East Indiaman wrecked against the cliffs in Purbeck in 1786 (MWX2065). This was a large maritime disaster in which only 74 of the 240 passengers and crew survived. The wreck was deemed important enough for a royal visit to the site. The wreck was salvaged at several times during its history and was relocated in 1967. Several artefacts are held by Dorchester Museum or in private collections.
3. Large timbers which have been identified on the foreshore just above low water mark west of Clavell's Hard, Kimmeridge (MWX4516).
4. Various small wreck timbers with clear treenails have been identified east of Rope Lake Head, Kimmeridge (MWX4517).
5. *Lady of Avenal*, a brigantine built in 1874 and hulked in Holes Bay, Poole Harbour, in the 1930s and subsequently blown up by the Royal Marines in 1979 (NRHE 904678). This vessel had a rich history and was at one point owned by Wilfred Dowman, owner of the Cutty Sark. The vessel also took part in a British Arctic expedition in 1925, during which it sailed closer to the North Pole than any other ship had previously.
6. *General Jackson*, a Thames barge, built in Ipswich in 1897, was brought to Poole in the late 1950s; it became a house boat and was burned in a fire in the 1970s (MWX2091).
7. *Mayflower*, a schooner or ketch thought to have come to Poole in 1919; it was used as a tearoom before being abandoned (Langley and Small 1988).
8. WW1 58 ft Towing Lighter, built in 1917. This vessel represents a dead end in the development of aircraft carriers. Only two others are known to exist: one is hulked in the River Hamble and the other is in the Fleet Air Arm Museum. The date at which the vessel came to Poole is unknown but it is recorded on aerial photographs as far back as 1945.
9. *Enecuri*, a Spanish steamship which sank on Portland Breakwater in 1900 (MWX2115). The wreck is said to be broken up but with the bow and stern reasonably intact.
10. *HMS Hood*, a Sovereign Class pre-Dreadnought battle cruiser built in 1891, which served in the Mediterranean. She was one of the first ships to have turrets. The ship was scuttled across the southern entrance of Portland breakwater in 1914 as a blockship to prevent submarine or torpedo attacks from entering the harbour (MWX2121).

11. *The Countess of Erne*, a paddle steamer built in 1868 sank in Portland harbour in 1935 (MWX2514).
12. *Himalaya*, built in 1853 and purchased by the Royal Navy as a troop ship in 1854, the *Himalaya* was one of the largest steam ships afloat. She was sunk in 1941 by the Luftwaffe inside Portland harbour (NRHE 904652).

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13 Project archive

The HE project number is **146331**

The project's documentary, photographic and drawn archive is housed at the offices of Historic Environment, Cornwall Council, Fal Building, County Hall, Treyew Road, Truro, TR1 3AY. The contents of this archive are as listed below:

1. A project file containing site records and notes, project correspondence and administration and copies of documentary/cartographic source material (file no 146331).
2. Digital photographs stored in the directory G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Dorset\Dorset Hampshire RCZAS DBA 146331\Images
3. English Heritage/ADS OASIS online reference: cornwall2-195580

This report text is held in digital form as: G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Dorset\Dorset Hampshire RCZAS DBA 146331\Final draft report\Dorset RCZAS report – final.doc

Appendix 1: GIS Method

Project area

The project area was 184.89 sq km of inland area and 58.24 sq km of area between MHW and LAT (approximately 245 sq km in total).

GIS will be used to produce gazetteers and as a structured way to update and create records (for later update to HBSMR)

GIS will be used to provide a single platform to carry out the initial production of gazetteers. The gazetteers included new sites and the existing records that have been created or updated by the RCZAS DBA.

The GIS was the reference basis which the later HBSMR update stage built upon. All work was undertaken by Graeme Kirkham.

Therefore two stages to work -

1. GIS (HE Projects system) – update existing records and creation of new records. Creation of xls based gazetteers from attribute table.

2. Update HBSMR (remote access on to Dorset HBSMR via dongle)

Appraisal and update method –GIS BASED (NOT HBSMR)

Export the existing HER point data from Dorset HBSMR and select to entire project area. A copy of this shapefile was kept as a reference. This will be a point shapefile – there was no data entry via polyline and polygons.

The following FIELDS to be added to the shapefile to allow easy data entry into the Dorset HBSMR at a later stage. The fields are listed with field parameters.

MonUID – Monument Unique Identifier – Numeric, integer, 10 [Existing field]

RECORDTYPE – text, 10 – USE STANDARDISED LIST

NAME – Location – text, 254 – FREE TEXT, USE DORSET METHOD TO INPUT

MONTYPE – text, 100 – USE EH THESAURUS

PERIOD – text, 100 – USE STANDARDISED LIST

FORM – text, 100 – USE STANDARDISED LIST

SUMMARY – TEXT, 254 – FREE TEXT

SOURCE – TEXT, 254 – USE STANDARDISED LIST

EASTING – DOUBLE, precision 15; scale 6 – AUTO POPULATE

NORTHING – DOUBLE, precision 15; scale 6 – AUTO POPULATE

UPDATE – Text, 50 – USE STANDARDISED LIST

URL – hyperlink to WORD doc to aid data entry – TEXT, 254

Rules

Start at one end of the project area and work to the other end covering approximately 16 sq km a day.

In addition to the Dorset HBSMR points the standard map/data sources as a bare minimum were –

- PAS records
- NRHE records
- Defence of Britain records
- OS 1-25 inch historic mapping 1-6 editions (and date map tiles)

- Tithe maps
- OS 1st edition?

Additional, local datasets

- Updates from journals, books
- Charts
- Events

Consistency in data entry is important. For example, we will create a single record where there were a lot of related features in a close concentration e.g. a group of small quarries within 50m of each other would get one point, centrally located in the group. Quarries separated by over 50m in distance in a linear arrangement would get single entries.

Group features together will not be over-recorded. For example, a group of field boundaries surviving as earthworks were, if the field shape and size could be identified, be recorded as a field system (single entry).

This is a general rule and there may be exceptions but keep things simple and straightforward.

There will be no deletion of records - only amendment of existing and creation of new.

Existing records – If records need to be removed by Dorset due to duplication add DUPLICATE to UPDATE field. If an NGR is wildly out of place we need to add AMEND NGR to UPDATE field and write a note in the summary field of the new NGR co-ordinates. We can then query the UPDATE field at the end of the GIS stage and email the details to Claire Pinder so the record can be amended in the maplink to the HBSMR.

New features

Create a NEW point centrally placed over feature with reference to the modern map at scale of 1:2500.

Buildings and features = point centrally placed. Linear features = put the point in central location along length of feature and in description add length of feature (metres) and start and finish points (always start in the south and work to the north, eg, SW to NE). If a dispersed linear feature avoid giving an NGR in a blank area.

Turn on transparency of historic maps and plot this way if feature no longer extant. Again, locate point against modern map if you can. If not possible, then add a note in description say approximate location.

Add monument details (see section for rules and lists). Mon UID for new sites will not be able to be added until the HBSMR stage.

Rules for each field

MonUID

Numeric. Existing records will maintain existing HBSMR number. MonUID numbers for new records will have to be inputted into GIS during the HBSMR update as HBSMR will create new numbers for new records automatically. The numbers will then have to be transcribed to the GIS shapefile for the purpose of good housekeeping and double-checking for mistakes.

RECORD TYPE

Text. Choose ONE from the following –

BLD (BUILDING)

FS (FINDSPOT)

HDG (HEDGEROW)

LND (LANDSCAPE)

MAR (MARITIME)

MON (MONUMENT)

NF (NATURAL FEATURE)

PLA (PLACE NAME)

RT (ROUTE)

Upper case abbreviation, copy and paste the abbreviation only to ensure data entry is consistent.

NAME

Lower case, text, short, concise, type of feature and its location eg Bowl barrow, one of the Southover Heath Group, Tolpuddle or Coastguard Station, St Aldhelm's Head

MONTYPE

Use EH Monument Thesaurus. http://thesaurus.english-heritage.org.uk/thesaurus.asp?thes_no=1&thes_name=EH%20Monument%20Type%20Thesaurus

Upper case, text. For multiple features use a comma and space eg SETTLEMENT, COUNTRY HOUSE

For possible site add a question mark eg SETTLEMENT? Or POSSIBLE SITES, MANOR?, SETTLEMENT?

PERIOD

Upper case, text. Broad period only, unless further detail needed. Must reflect the chronology and terminology expressed in the summary text. Used to aid retrieval. HBSMR will be able to handle multiple indexing so if a complex site keep further notes in long description in an accompanying WORD doc (use FID number as a reference). Copy Period name only to ensure data consistency. (Following values and ranges from Dorset HBSMR).

PALAEOLITHIC (-5mya to -10,001)

LOWER PALAEOLITHIC (-5mya to -150,001)

MIDDLE PALAEOLITHIC (-150,001 to - -40,001)

UPPER PALAEOLITHIC (-40,000 to -10,001)

MESOLITHIC (-10,001 to -4,001)

EARLY MESOLITHIC (-10,001 to -7,001)

LATE MESOLITHIC (-7,000 to -4,001)

NEOLITHIC (-4,000 to -2,351)

EARLY NEOLITHIC (-4,000 to -3,001)

MIDDLE NEOLITHIC (-3,000 to -2,701)

LATE NEOLITHIC (-2,700 to -2,351)

BRONZE AGE (-2,350 to -801)

EARLY BRONZE AGE (-2,350 to -1,501)

MIDDLE BRONZE AGE (-1,501 to -1,001)

LATE BRONZE AGE (-1,000 to -801)

IRON AGE (-801 to 42)

EARLY IRON AGE (-801to -401)

MIDDLE IRON AGE (-400 to – 101)

LATE IRON AGE (-100 to 42)

ROMAN (43 to 410)

EARLY MEDIEVAL (410 to 1065)

MEDIEVAL (1066 to 1539)

POST MEDIEVAL (1540 to 1900)

MODERN (1901 to present)

UNCERTAIN

FORM

Upper case, text. See EH Evidence thesaurus for further info and options

http://thesaurus.english-heritage.org.uk/thesaurus.asp?thes_no=92&thes_name=EH%20Evidence%20Thesaurus

ARCHITECTURAL COMPONENT

ARTEFACT SCATTER

BOTANICAL FEATURE

BURIED VESSEL STRUCTURE

COHERENT VESSEL STRUCTURE

COLLAPSED VESSEL STRUCTURE

CONJECTURAL EVIDENCE

CROPMARK

DOCUMENATRY EVIDENCE

DEMOLISHED STRUCTURE

DEMOLISHED BUILDING

DESIGNED LANDSCAPE

DESTROYED MONUMENT

EARTHWORK

ENHANCED NATURAL FEATURE

EXTANT STRUCTURE

FIND

LEVELLED EARTHWORK

MOVED BUILDING

MOVED STRUCTURE

ORAL EVIDENCE

RUINED BUILDING

RUINED STRUCTURE

SUB SURFACE DEPOSIT

SCATTERED VESSEL STRUCTURE

STRATIFIED FIND

SUBMERGED MONUMENT

SUB SURFACE DEPOSIT

UNSTARTIFIED FIND

VESSEL STRUCTURE

WRECKAGE

Either select one from list above or if multiple options use a comma and space to separate eg WRECKAGE or SCATTERED VESSEL STRUCTURE, ARTEFACT SCATTER

SUMMARY

Short text

Lower case, free text. This is summary text so succinct and clear summary no more than 254 characters in length. Full sentences in grammatically correct non-technical English. Abbreviations and acronyms not used. Eg One of nine round barrows that make up the Southover Heath Group. If quoting measurements then use metres eg measuring 10 metres in diameter.

Where we think that a record is a duplicate mention in summary and give the full MONUID number that you think the record duplicates. This text may not necessarily be added to the updated HBSMR entry.

Where we think that the NGR for a record is way off then mention in summary and give the full revised NGR (eg SY 22222 33444) that you think the record should have. This text may not necessarily be added to the updated HBSMR entry.

Long text

IMPTNT - Long text description for inputting into HBSMR must be kept in a separate WORD doc. Concise, clear and succinct referencing the main sources only. Each entry in WORD doc should include FID number at start eg

FID – 123

MONUID – add if existing otherwise N/A

Long description

Xxxxxaid detail

The FID is a unique identifier automatically given to each point in the GIS so it will not matter if no MONUID has been created. It will be best to write the long description as the record is updated in the GIS stage, as this will aid data entry in the HBSMR stage. It will be important to ensure that the reference system is kept simple to aid data entry in the HBSMR stage as very exact requirements.

In advance of the work we will create a list of sources already entered into Dorset HBSMR.

New sources (not yet used in HBSMR) should be written using similar system.

It will also be important to include one of the two following paragraphs at the end of each entry updated or created.

Updated record (including duplicates and amend NGRs)

This record was updated as part of the Dorset Rapid Coastal Zone Assessment (2014).

Newly created

This record was created as part of the Dorset Rapid Coastal Zone Assessment (2014).

UPDATE (field)

Upper case, text. Added to all sites updated or created to enable a record of type of work undertaken and to enable creation of gazetteers.

Select one of the following – not the description in brackets. Use copy and paste to ensure data consistency.

NEW (newly created feature)

UPDATED (updated MWX feature)

DUPLICATE (a record we think is a duplicate – in summary text record details of the record you think it duplicates)

AMEND NGR (a record where the NGR is misplaced)

Results

At the end of the GIS stage we should have an updated shapefile containing new and amended point data (including those recommended for NGR update and probable duplicate records).

The shapefile will double-checked to ensure data consistency and topology rules.

This shapefile will be used for the basis of the gazetteers to show the sites amended and created by the project.

HBSMR update stage

This requires using Dorset's HBSMR and will require liaison with Claire Pinder. We envisage this stage happening in October/November 2014 and will require HE Projects logging remotely on to Dorset's HBSMR via a dongle.

It is anticipated that up to 25 sites will be able to be updated or created a day.

Krystyna Truscoe (HE projects) will provide technical support and a training day for data entry.

Appendix 2: List of UKHO charts

UKHO ref	Date	Surveyor	Title	Notes
UKHO D1236	1854	Lieut HL Cox RN	South Coast of England, Lyme Regis.	Includes buoys & former extent of Cobb and shows harbour. Also includes a coastal view.
UKHO A6767	1813	Joseph Desiou	Plan of the proposed Portland Harbour for the Reception & Shelter of this Majesty's Ships of the Sea, The East & West India Convoys & all other vessels.	Small chart, overview of Portland - St Aldhelm's Head. Marks rock hazards and existing features although it is not always clear what is extant and what is proposed.
UKHO A522	1816	Colonel Mudge	The Coast of Dorsetshire from Exmouth to St Alban's Head including West Bay, Wymouth and Portland Roads.	
UKHO E342	E19th century	John Fonterton	Plan of a Breakwater for a Harbour at Portland	Plan of proposals. Useful anchorages e.g., Weymouth Roads, Chesil Beach & Lulworth Cove. Also includes a cross-section of presumably the proposed breakwater.
UKHO B883	1681-88	Capt Grenville Collins	Weymouth &Portland Approaches.	Index entry gives date range as 1681-88.
UKHO B5262	1896	F Haselwood	Inset for Published Plan of Portland Harbour from the original sounding sheet.	Possibly the wrong details but unsure - may need checking with UKHO if used.
UKHO B271	1812	William Heather	South Coast of England including Poole Bay, Weymouth and Portland Roads, together with the race of Portland & Bridport Harbour.	Perhaps simply a replication of A522 as it includes the same view and detail.
UKHO E4885	1936	Lieut Commander WC Jenks	Portland Harbour.	Very detailed and includes inset of Portland Coaling piers. Soundings, buoyage, wrecks, etc., presumably to redo [?] Very detailed soundings
UKHO L8901	poss 1852	James M Kendel FRS and John Coode	Chart of Portland and Weymouth Rocks, showing the intended Harbour of Refuge & Breakwater.	Possibly dated 1852 (in pencil) Shows two proposed breakwaters & details on Portland.
UKHO B318	1802	John Knight, Esq, Rear Admiral of the Blue	A Chart of the Isle, Roads & Race of Portland, West bay and coast with observations recently made on the latter by John Knight, Esq, Rear Admiral of the Blue.	Shows anchorages in Weymouth, Portland Road & West Bay. It also includes a nice view of Portland Bill with ships anchoring in West Bay.
UKHO E879	1785	Lieutenant Murdoch Mackenzie	Survey of the South Coast of England, Blackwood Point on the Isle of Wight to St Alban's Head.	Only shows St Alban's Head of project area. Chart focuses on Portland and West Solent.

UKHO 625	1787	Lieutenant Murdoch Mackenzie	The Coast from St Alban's Head in Dorset to Sidmouth in Devon.	Original survey, often used for later surveys & engravings of charts in early 19th century. Includes harbour surveys for Bridport.
UKHO E8633	1949	CPO [?] F Marshall RN and Master AE Wilson	Portland Coaling Piers.	Gives post-war details of things being taken down & wreckage of post-war.
UKHO C7755	1915	MOD	Defences of Portland Harbour.	Includes notes on submarine defences including sinking of *HMS Hood.*
UKHO 7555	1918	MOD	Weymouth Bay submarine defences.	Notes in pen on an existing hydrographic chart; the chart is dated 1918.
UKHO B318a	10th June 1779	Printed for Robert Sayer & John Bennett, Chart Sellers, No 53 Fleet Street, 10th June 1779	A Chart of the Isle Road & Race of Portland with the Shambles & coast.	
UKHO Index Map (ref 2268)	1939 – 1957	Unknown	Unknown	Chart used as an index map is entitled 'Portland Harbour' & noted as 'Original surveyed 1939, with new editions in 1951 &1954 & corrections in 1957'. Useful chart including targets, mooring buoys.

Appendix 3: List of Scheduled Monuments

National Heritage List no	Name	NGR
1002397	Two bowl barrows 405m north west of Barn Cottage, Hengistbury Head	SZ 16354 91357
1002397	Two bowl barrows 405m north west of Barn Cottage, Hengistbury Head	SZ 16255 91270
1002371	Site of Town Walls in, and E of, Druitt Gardens	SZ 15675 92723
1002406	Mesolithic sites near Culver Well	SY 68413 69082
1002823	Lynchets S of Stavordale Wood	SY 56422 84584
1002411	The Verne Citadel	SY 69327 73224
1002733	Round barrow 250yds (230m) S of Chapel Coppice	SY 57379 84319
1002388	Portland Bill stone loading quay	SY 67967 68480
1002704	Preston Roman villa	SY 70308 82701
1002367	Multi-period landscape on Hengistbury Head	SZ 17289 90789
1002491	Town wall W of Thames Street	SZ 00802 90337
1002370	Christchurch Bridge	SZ 16076 92757
1002729	Portland open fields	SY 67964 69235
1002406	Mesolithic sites near Culver Well	SY 68491 69382
1002729	Portland open fields	SY 68639 69635
1020358	Icehouse at Ringstead, 660m south west of Pit House	SY 74612 81593
1002692	Town cellar	SZ 00860 90312
1021435	Upton Fort, a coastal artillery battery and two searchlight emplacements	SY 74137 81573
1021435	Upton Fort, a coastal artillery battery and two searchlight emplacements	SY 74290 81437
1003205	Scaplen's Court, High Street	SZ 00884 90352
1003574	Part of the defences of the Anglo-Saxon fortified centre of Wareham and part of the motte and bailey castle with shell keep	SY 92608 87730
1021435	Upton Fort, a coastal artillery battery and two searchlight emplacements	SY 74036 81492
1002350	Bowl barrow 390m east of Tuckton Roundabout	SZ1528792092
1002390	Remains of bridge in cellar of No 2 Bridge Street	SY 34252 92109
1003572	North Bridge, Wareham	SY 92140 87814
1002728	Kingston Down Romano-British farm	SY 95724 78011
1002727	The old prison and pump	SZ 02987 78750
1002821	St Gabriel's Church	SY 40209 92408
1002698	Rufus Castle	SY 69682 71134

1008523	Bowl barrow 650m south of Chaldon Down Buildings: part of the Chaldon Down round barrow cemetery	SY 78312 81250
1003574	Part of the defences of the Anglo-Saxon fortified centre of Wareham and part of the motte and bailey castle with shell keep	SY 92465 87850
1003574	Part of the defences of the Anglo-Saxon fortified centre of Wareham and part of the motte and bailey castle with shell keep	SY 92161 87186
1002705	Bindon Hill camp	SY 83530 80255
1002412	Battery 200yds (180m) E of the Naval cemetery	SY 69445 74059
1002398	Round barrow E of Southcliffe Road, Mudeford	SZ 19181 92814
1014299	Bowl barrow on Arne Hill 270m south west of Arne Dairy House	SY 96926 88160
1016101	Three bowl barrows north east of Thorncombe Beacon, 160m, 190m and 400m south west of Down House	SY 43755 91812
1016432	Two bowl barrows 560m and 650m north west of Newlands Farm	SY 80501 81281
1003573	St Martin's Church	SY 92222 87701
1018277	Pre-Conquest monastery, early Christian cemetery, Augustinian priory and a motte and bailey castle at Christchurch	SZ 16015 92560
1021435	Upton Fort, a coastal artillery battery and two searchlight emplacements	SY 74338 81391
1016101	Three bowl barrows north east of Thorncombe Beacon, 160m, 190m and 400m south west of Down House	SY 43775 91720
1016101	Three bowl barrows north east of Thorncombe Beacon, 160m, 190m and 400m south west of Down House	SY 43597 91617
1008520	Bowl barrow 550m south of Chaldon Down Buildings: part of the Chaldon Down round barrow cemetery	SY 78367 81348
1020732	Sharford footbridge	SY 96665 84767
1002776	Sandy Barrow W of East Farm Dairy	SY 73027 82586
1018201	Bowl barrow 550m north west of Cogden Farm	SY 50137 89137
1016373	A group of four bowl barrows on Golden Cap 515m south east and 630m south east of St Gabriel's House	SY 40557 92104
1016373	A group of four bowl barrows on Golden Cap 515m south east and 630m south east of St Gabriel's House	SY 40722 92201
1019951	Group of medieval strip lynchets at East and West Man	SY 97790 76395
1019393	Medieval settlement at West Ringstead	SY 74861 81642
1017308	Early Christian enclosure on St Aldhelm's Head	SY 96071 75559
1018435	The Warren field system	SY 79533 80770

1013371	Romano-Celtic temple and associated remains at Jordan Hill	SY 69892 82069
1008676	Wardstone Barrow: a bowl barrow on the Dorset coastal ridge 300m south of Chideock Farm	SY 79340 81336
1005579	World War II pillbox and tank traps in former railway yard N of town	SZ 15516 93395
1008521	Bowl barrow 660m south of Chaldon Down Buildings: part of the Chaldon Down round barrow cemetery	SY 78373 81255
1003574	Part of the defences of the Anglo-Saxon fortified centre of Wareham and part of the motte and bailey castle with shell keep	SY 92689 87319
1003574	Part of the defences of the Anglo-Saxon fortified centre of Wareham and part of the motte and bailey castle with shell keep	SY 92044 87328
1018200	Bind Barrow	SY 49406 88806
1003574	Part of the defences of the Anglo-Saxon fortified centre of Wareham and part of the motte and bailey castle with shell keep	SY 92001 87406
1003574	Part of the defences of the Anglo-Saxon fortified centre of Wareham and part of the motte and bailey castle with shell keep	SY 92662 87556
1020062	Sandsfoot Castle	SY 67461 77399
1003574	Part of the defences of the Anglo-Saxon fortified centre of Wareham and part of the motte and bailey castle with shell keep	SY 92657 87396
1019951	Group of medieval strip lynchets at East and West Man	SY 97626 77180
1005579	World War II pillbox and tank traps in former railway yard N of town	SZ 15432 93353
1019951	Group of medieval strip lynchets at East and West Man	SY 97963 77226
1020063	Nothe Fort, tramway and searchlight battery at The Nothe	SY 68701 78792
1020063	Nothe Fort, tramway and searchlight battery at The Nothe	SY 68508 78740
1020063	Nothe Fort, tramway and searchlight battery at The Nothe	SY 68667 78726
1015693	St Peter's Abbey	SY 57754 85093
1019951	Group of medieval strip lynchets at East and West Man	SY 97359 76021
1011484	Bowl barrow on Hambury Tout: the eastern of two round barrows on Hambury Tout	SY 81639 80294
1011483	Bell barrow on Hambury Tout: the western of two round barrows on Hambury Tout	SY 81581 80291
1008146	Bowl barrow 470m south east of Down Barn: an outlier of the Chaldon Down barrow group	SY 78213 81553
1016431	Bowl barrow 900m south east of Chideock Farm	SY 80069 81117

1015696	Two fishponds in Oddens Wood	SY 58012 84863
1014300	Bowl barrow on Arne Hill 200m south of Arne Dairy House	SY 97163 88067
1017307	Alum works, other multi-period industrial remains and an associated group of jetties and breakwaters, Kimmeridge Bay	SY 90886 78790
1015694	St Catherine's Chapel, field system and quarries at Chapel Hill	SY 57329 84672
1008178	Bowl barrow 200m south east of Hill Barn: one of a group of three barrows	SY 77547 81143
1008162	Two bowl barrows 200m south east of Hill Barn: two of a group of three barrows	SY 77587 81175
1014296	Bowl barrow in Bartlett's Firs	SY 91643 85709
1015695	Duck decoy at Abbotsbury Swannery, 630m SSW of Horsepool Farm	SY 57600 84036
1011482	Bowl barrow north of Red Hole, 630m SSE of Newlands Farm	SY 81198 80393
1014290	The King Barrow 200m south east of The Warren Wood	SZ 04604 82023
1008127	Two bowl barrows 560m south east of Hill Barn	SY 77920 81020
1014294	Group of three round barrows on Ballard Down	SZ 03976 81311
1019151	Royal Naval Cordite Factory at Holton Heath	SY 94561 90433
1014295	The King's Barrow 230m east of Bartlett's Firs	SY 92039 85724
1014297	Bowl barrow west of Studland Bay House	SZ 03298 82982
1019151	Royal Naval Cordite Factory at Holton Heath	SY 95611 91058
1008142	Two barrows in Halcombe Vale, 700m south west of Monastery Farm	SY 85665 80485
1008141	Flower's Barrow: a small multivallate hillfort and associated outwork on Rings Hill	SY 86455 80595
1014293	Bowl barrow at the eastern end of Ballard Down	SZ 04202 81326
1019409	Heavy Anti-aircraft battery on Arne Hill	SY 97084 88121
1017271	Bowl barrow on Swyre Head	SY 93413 78455
1014298	Bowl barrow 100m north west of Studland Bay House	SZ 03226 83058
1017268	Bowl barrow on Emmett's Hill	SY 95809 76486
1015326	Portland Castle	SY 68463 74361
1017267	Bowl barrow on St Aldhelm's Head, 470m north east of St Aldhelm's Chapel	SY 96328 75955
1019151	Royal Naval Cordite Factory at Holton Heath	SY 94616 90897
1019151	Royal Naval Cordite Factory at Holton Heath	SY 95134 91580
1021302	RAF Portland, site of Rotor early warning radar station	SY 69548 73339
1016724	Fishpond at West Ringstead, 590m south of Pit House	SY 75091 81454

Appendix 4: Grade I and Grade II* Listed Buildings

National Heritage List no	Name	Grade	NGR
1110077	Highcliffe Castle	I	SZ 20286 93208
1110141	Christchurch Priory and Parish Church	I	SZ 16031 92531
1110811	Buddle Bridge	I	SY 34251 92100
1120029	Parish Church of Lady St Mary	I	SY 92490 87193
1120256	St Aldhelm's Chapel	I	SY 96071 75559
1120271	Parish Church of Saint Nicholas	I	SZ 03643 82511
1147947	Church of St Mary	I	SY 67964 78823
1152080	Parish Church of The Holy Trinity	I	SY 63383 80521
1153014	Church of St Peter	I	SZ 08883 91216
1153149	Church of St Martin	I	SY 92219 87697
1153159	The Castle	I	SZ 15968 92661
1153598	Holy Trinity Gallery	I	SY 92340 87212
1172576	Chapel of St Catherine	I	SY 57254 84836
1203132	Church of St George, Reforne	I	SY 68653 72012
1205262	Portland Castle	I	SY 68459 74370
1213878	Parish Church of St Mary	I	SY 48864 89492
1217514	The Waterfront Museum, Local History Centre	I	SZ 00861 90313
1224145	Sir Peter Thompson House	I	SZ 01048 90692
1229389	Parish Church of St Michael	I	SY 34335 92205
1229437	The Cobb Piers and Walls including North Wall	I	SY 33843 91509
1275378	Old Town House (Scaplens Court Museum)	I	SZ 00879 90359
1278935	Congregational Church Forecourt Wall At Congregational Church	I	SY 34171 92278
1280727	Rufus Castle with Bridge	I	SY 69757 71175
1304408	Town Bridge	I	SZ 16069 92753
1304449	Waterloo Bridge	I	SZ 16256 92833
1323421	Parish Church of St Nicholas	I	SY 97238 88127
1323598	No 9 (The Manor House) including Garden Wall	I	SY 92369 87326
1324343	Bridge 15 yards north east of Buddle Bridge	I	SY 34266 92110
1324756	Church of St Stephen	I	SZ 08523 91507

1325069	The Constable's House	I	SZ 16050 92706
1365879	Kings Statue	I	SY 68019 79302
1038260	Statue House, Johnstone Row (Terrace)	II*	SY 68005 79202
1038271	Gloucester Lodge with the Cork and Bottle public house	II*	SY 68001 79373
1096763	Sandsfoot Castle remains	II*	SY 67482 77372
1108183	Tyneham House	II*	SZ 16142 92801
1108803	Church of St Ambrose	II*	SZ 07140 90871
1108857	Russell Cotes Museum	II*	SZ 09222 90894
1110072	Red House Museum	II*	SZ 15890 92560
1110074	Place Mill	II*	SZ 16001 92395
1110139	Railings, Gate and Wall at No 13 (Church Hatch)	II*	SZ 15972 92606
1118700	Old Parish Church	II*	SY 63545 80051
1119231	Glebe Cottage and Attached Walls	II*	SY 74731 81764
1119948	12, West Street	II*	SY 92249 87354
1119949	No 22 (St Michaels House)	II*	SY 92211 87337
1120010	Streche's Almhouses	II*	SY 92371 87380
1120030	The Priory of Lady St Mary including Walls Immediately to west	II*	SY 92493 87166
1132601	Netherton Nursing Home	II*	SY 67509 78600
1132630	Guildhall with Attached Rear Boundary Wall	II*	SY 67943 78756
1132631	Black Dog Public House	II*	SY 67994 79138
1142294	Maiden Street Methodist Church	II*	SY 67993 78757
1145964	Devonshire Buildings (Terrace)	II*	SY 68245 78836
1145965	Pulteney Buildings (Terrace)	II*	SY 68194 78823
1147950	The White Hart Public House	II*	SY 67869 79006
1147976	Numbers 1-12 with Railings	II*	SY 68166 79912
1148063	Malthouse Number 4	II*	SY 68122 78485
1148099	Church of The Holy Trinity	II*	SY 67857 78650
1152799	Church of St John The Evangelist	II*	SZ 11055 91713
1153507	12, South Street	II*	SY 92338 87300
1153839	The Moorings	II*	SZ 18286 92064
1203085	Queen Anne House with Boundary Wall and Gate Piers	II*	SY 68920 73298
1203116	The Citadel, South Entrance	II*	SY 69333 73418
1203117	The Citadel, South West and South East Casemates	II*	SY 69238 73547

1205280	Gateway and Curtain Wall to South East Of Captain's House	II*	SY 68447 74341
1205384	Ruins of Church Of St Andrew	II*	SY 69679 71106
1205607	Church of St Peter	II*	SY 69889 72581
1205631	Grove County Primary School with Rear Boundary Wall	II*	SY 69954 72555
1206120	The Citadel, North Entrance	II*	SY 69062 73874
1215956	Chapel of St Gabriel	II*	SY 40208 92409
1217470	Church of St James	II*	SZ 00841 90438
1217483	73, High Street	II*	SZ 01113 90522
1217517	West End House and Attached Front Garden Railings and Gate	II*	SZ 00774 90438
1223864	Beech Hurst and Attached Rear Area Railings	II*	SZ 01331 90801
1225272	Hotel Du Vin and Attached Front Area Wall and Railings	II*	SZ 00797 90366
1225477	Upton House	II*	SY 99310 92991
1228691	The Guildhall	II*	SY 34297 92110
1228722	Messrs Norman Goods Warehouse	II*	SY 46360 90350
1229647	Shelby House	II*	SY 34167 92257
1230135	Belmont	II*	SY 33748 92040
1230401	Roman Catholic Church of St Michael and St George. Presbytery.	II*	SY 33760 92290
1266739	The Guildhall	II*	SZ 01000 90562
1267416	St Anne's Hospital	II*	SZ 05242 88784
1272142	Church of St John the Evangelist	II*	SY 68230 80058
1275356	United Reform Church and Attached Wall and Railings to North East	II*	SZ 01247 90444
1275357	Kinges Halle	II*	SZ 00840 90308
1275358	Custom House	II*	SZ 00872 90296
1275386	20, Market Street	II*	SZ 00957 90531
1275403	The Old Rectory	II*	SY 99832 90586
1275413	12 and 14, High Street	II*	SZ 00940 90389
1280817	Captain's House	II*	SY 68435 74359
1303953	Priory Cottage	II*	SZ 15961 92502
1304357	Gateway to Christchurch Churchyard	II*	SZ 15974 92594
1313430	Nothe Fort and Outer Gateway	II*	SY 68706 78735
1313440	Belfield House	II*	SY 66756 77885
1323346	Little Bindon	II*	SY8305279865
1323430	Church of Saint Mary	II*	SZ 02822 87772

1323584	41, West Street	II*	SY 92166 87307
1323601	Black Bear Hotel	II*	SY 92339 87292
1324126	Queen's Armes Hotel	II*	SY 36610 93659
1324652	Church Hatch	II*	SZ 15975 92616
1324690	Greystones	II*	SZ 21654 93390
1324732	Church of St Michael (Including Tower)	II*	SZ 07943 91197
1325061	3, Bridge Street	II*	SZ 16119 92767

Appendix 5: New sites by period and monument type

627 sites in total up to 21st August 2014. New —528 sites Update or Update — wrong location – 99 sites

Number of new sites	Period
2 sites	Bronze Age
1 site	Bronze Age/ post-medieval
1 site	Iron Age
1 site	Late Iron Age/Roman period
1 site	Medieval
3 sites	Medieval/post-medieval
383	Post-medieval
5 sites	Post-medieval/modern
129 sites	Modern
2 sites	Uncertain

New sites by Monument Type

Abattoir	1	Bridge	6
Alder bed	1	Building	12
Allotment	65	Burial	1
Almshouse	2	Butts	1
Archery Ground	1	Cabinetmakers	1
Art School	1	Car Factory	1
Assembly Rooms	1	Causeway	2
Aviary	1	Cemetery	8
Ball Clay Works	1	Chapel	3
Bandstand	4	Church	10
Baptist Chapel	2	Church Hall	1
Barrow	4	Cinema	3
Baths	1	Clay Pit	5
Battry	3	Clay Works	1
Bible Christian Chapel	2	Cliff Railway	2
Boathouse	24	Club, War Memorial	1
Boating Lake	1	Coal Depot	4
Boundary	3	Coastal Battery	2
Boundary Bank	1	Coastguard Station	5
Boundary Stone	2	Caostguards Cottage	2
Boundary, Flood Defences	2	Commemorative Monument	1
Breakwater	1	Common Land	4
Brethren Meeting House	1	Congregational Chapel	6
Brewery	7	Copperas Works	2
Brick yard	1	Cottage Hospital	1
Brickfield	2	Country House	1
Brickworks	1	Cricket Ground	5

Croquet Lawn	1
Custom House	1
Dairy	1
Dam	1
Deer Park, Warren	1
Dewpond	2
Direction Arrow	1
Dispensary	1
Drain	1
Drainage System	4
Drill Hall	6
Drinking Fountain	1
Dye Works	1
Earthwork	4
Electricity Sub Station	1
Embankment	9
Enclosure	2
Engine Shed	1
Engineering Works	1
Explosives Manufacturing Site	1
Extractive Pit	16
Factory	2
Fair	1
Farm	1
Farmstead	1
Ferry Crossing	3
Field Barn	1
Fire Engine House	1
Fire Station	1
Firing Range	3
Fish Market	1
Fishery	1
Fishing Cellar	1
Fishpond	1
Flagpole	6
Flour Mill	1
Flying Boat Station	2
Folklore Site	1
Footballl Ground	2
Footbridge	3
Ford	12
Fountain	3
Freemasons Hall	1
Game Covert	1
Gamekeepers Lodge	1
Gaol	1
Garden	6
Garden Building	1
Gas Meter House	1
Gas Works	5
Gate Lodge	1
Golf Course	6
Goods Shed	2
Gravel Pit	23
Groyne	4
Hamlet	2
Hard	1
High Light	1
Historical Site	1
Holiday Camp	1
Hollow Way	2
Homestead	4
Hospital	5
House	6
Hydraulic Ram	1
Icehouse	3
Iron Foundry	1
Ironworks	1
Jetty	3
Kennels	1
Kiln	1
Landing Pier	1
Landing Point	1
Landing Stage	18
Laundry	3
Level Crossing	1
Library	1
Lifeboat Station	1
Lifesaving Equipment Apparatus House	1
Lime Kiln	2
Local Government Office	1
Lodge	13
Lookout	6
Low Light	1
Magazine	1
Malt House	6
Meadow	1
Meeting Hall	1
Methodist Chapel	4
Midden	1
Military Camp	1
Mill	3
Mill Pond	2
Mill Race	1
Mine	7
Mineral Railway	1
Mission Church	2

Mission Hall	9
Model Farm	2
Modern Place Name	1
Mole	4
Monastery	1
Mooring Bollard	1
Mortuary	2
Mortuary Chapel	1
Navigation Aid	4
Nonconformist Cemetery	1
Nonconformist Chapel	3
Nonconformist Church	1
Nonconformist Meeting House	3
Nunnery	1
Nursery garden	2
Orchard	6
Ornamental Lake	3
Outdoor Swimming Pool	1
Outfall Sewer	2
Paint Factory	2
Palaeochannel	1
Parish Hall	5
Parish Room	2
Park	1
Path	1
Pavilion	1
Pier	7
Plantation	3
Plantation Bank	1
Police Station	3
Pond	14
Position Finding Station	1
Pottery Works	6
Pound	6
Power Station	2
Primitive Methodist Chapel	3
Productive Walled Garden	6
Promenade	6
Public Convenience	9
Public Hall	1
Public House	1
Public Library	1
Public Park	6
Pumping Station	3
Putting Green	1
Quarry	7
Quay	7
Radar Station	3
Radio Station	1
Railway Building	1
Railway Embankment	1
Railway Station	7
Railway Viaduct	1
Railway	1
Reading Room	5
Recreation Ground	16
Rectangular Enclosure	1
Reservoir	8
Road	6
Rocket Post	5
Rocket Staff	1
Roman Catholic Chapel	1
Ropery	1
Ropewalk	1
Salt Production Site	1
Salvation Army Hall	3
Sand Pit	1
Saw Mill	1
Saw Pit	5
School	51
Sea Defences	3
Semaphore Station	1
Semi Detached House	1
Settlement	4
Sewage Pumping Station	2
Sewage Works	6
Shaft	1
Sheep Fold	1
Sheep Wash	5
Shelter	6
Shipyard	2
Shooting Stand	1
Skating Rink	1
Slipway	18
Sluice	3
Spa	1
Spoil Heap	1
Sports Ground	3
Spring	4
Stadium	1
Statue	1
Stepping Stones	1
Steps	12
Stonemasons Yard	2
Storage Pit	1
Strip Lynchet	1
Summerhouse	2
Sunday School	1

Swannery	1	Village Hall	2
Swimming Pool	3	Wagon Works	1
Swing Bridge	1	Walk	1
Synagogue	1	War Memorial	7
Telephone Exchange	1	Warren	5
Temperance Public House	1	Water Pipe	1
Tennis Court	13	Water Supply Site	1
Terraced Garden	1	Water Tank	2
Theatre	1	Water Tower	2
Timber Yard	15	Water Wheel	1
Toll Gate	1	Watermill	1
Toll House	2	Waterworks	3
Torpedo Station	1	Weir	2
Trackway	2	Well	3
Tram Depot	1	Wesleyan Methodist Chapel	7
Tramway	11	Wharf	1
Tramway Transport Site	1	Winch	1
Tree Avenue	2	Windmill	1
Tunnel Portal	2	Winter Garden	1
Ventilation Shaft	2	Withy Bed	11
Viaduct	1	Workhouse	2

Appendix 6: List of sites at risk due to NAI in the Two Bays SMP area

Historic environment sites at risk due to NAI in the Poole and Christchurch Bays area as listed in annexe 3 of the Two Bays SMP (from Royal Haskoning 2011).

Heritage feature	Site ID	Designation/period	PDZ	Policy plan	Epoch (years)
Listed Buildings					
Street boundary at Scotts Cottage, Mudeford, Christchurch	101579	Listed Building Grade II	2	NAI	0–20
Gundimore, Mudeford, Christchurch	101580	Listed Building Grade II	2	NAI	20–50
Scotts Cottage	101578	Listed Building Grade II	2	NAI	20–50
Russell Cotes Museum	101826	Listed Building Grade II	2	NAI	20–50
Sandhills	101575	Listed Building Grade II	2	NAI	50–100
The Anchorage	101577	Listed Building Grade II	2	NAI	50–100
St Katherine's Church Hall	101913	Listed Building Grade II	2	NAI	50–100
The Pavilion Theatre & surrounding raised terrace and steps	469019	Listed Building Grade II	2	NAI	50–100
Letter box at junction with Grove Road	101930	Listed Building Grade II	2	NAI	50–100
Highcliffe House	101706	Listed Building Grade II	2	NAI	50–100
Royal Bath Hotel	101706	Listed Building Grade II		NAI	50–100
Brookside & Brookside Cottage	101743	Listed Building Grade II	2	NAI	50–100
The Villano & National Trust restaurant including boundary walls on N & SE	109079	Listed Building Grade II	3	NAI	20–50
The Warden's House	109084	Listed Building Grade II	3	NAI	20–50
Terrace walls & steps immediately SE of Brownsea Castle	109074	Listed Building Grade II	3	NAI	20–50
The Boat House	109085	Listed Building Grade II	3	NAI	20–50
Walls & terrace walls to walled garden immediately NE of Brownsea Castle including gazebo in S corner	109075	Listed Building Grade II	3	NAI	20–50
Farm Cottages	109088	Listed Building Grade II	3	NAI	20–50
Carpenter's cottage & the National trust shop & information centre	109080	Listed Building Grade II	3	NAI	20–50
Quay cottages	109082	Listed Building Grade II	3	NAI	20–50
Carpenter's shop	109083	Listed Building Grade II	3	NAI	20–50

St Anne's Hospital	412471	Listed Building Grade II	3	NAI	50–100
The Boat House	412515	Listed Building Grade II	3	NAI	50–100
The Engine house	109081	Listed Building Grade II	3	NAI	50–100
Unknown	108180	Listed Building Grade II	4	NAI	50–100
The Clock Tower	108174	Listed Building Grade II	4	NAI	50–100
Durlston Head Castle	108174	Listed Building Grade II	4	NAI	50–100
Non-designated historic environment interests					
Boundary wall, Scotts Cottage	MDO15860	Post-medieval	2	NAI	0–20
Hengistbury Head	NHLE 1002367 MX1136	Scheduled Monument Upper Palaeolithic	2	NAI	0–20
Round barrow	MDO8624	Late Neolithic	2	NAI	0–20
Clarendon Rocks pier	-	*c* 1660	2	NAI	50–100
2 Barrows	-	Bronze Age	2	NAI	50–100
Mesolithic site	MDO8640	Mesolithic	2	NAI	0–20
Figurine / whetstone	MDO8641	Palaeolithic	2	NAI	0–20
Mesolithic site	MX1157	Mesolithic	2	NAI	0–20
Figurine / whetstone (Hengistbury Head)	MWX 1160	Upper Palaeolithic	2	NAI	0–20
Flint implements (Boscombe)	MWX1230	Palaeolithic	2	NAI	0–20
Scotts Cottage	MDO15859	Post-medieval	2	NAI	20–50
Gundimore House	MDO15861	Post-medieval	2	NAI	20–50
Round barrow	MDO8629	Bronze Age	2	NAI	20–50
Round barrow	MDO8638	Bronze Age	2	NAI	20–50
Round Barrow (Warren Hill)	MDO8630	Bronze Age	2	NAI	20–50
PLUTO cable (Hengistbury Head)	NHLE 1002367 MWX2800	Scheduled Monument Modern	2	NAI	20–50
Coastguard watch house (Hengistbury Head)	NHLE 1002367 MWX4798	Scheduled Monument Post-medieval	2	NAI	20–50
Beaker vessel (Southbourne)	MDO8521	Chalcolithic	2	NAI	20–50
Handaxes (Wick)	MWX1170	Lower Palaeolithic	2	NAI	20–50
Pits (Southbourne)	MWX1223	Neolithic	2	NAI	20–50
Flint implements (Southbourne)	MWX1238	Mesolithic	2	NAI	20–50
Handaxe (Southbourne)	MWX1267	Lower Palaeolithic	2	NAI	20–50
Handaxes (Southbourne)	MWX1275	Lower Palaeolithic	2	NAI	20–50
Practising battery, Christchurch	MWX4801	Post-medieval / modern?	2	NAI	20–50
Magazine, Christchurch	MWX4800	Post-medieval / modern?	2	NAI	20–50

Beach obstacle	MWX4801	Modern?	2	NAI	20–50
Gravel pits, Boscombe	MWX4904	Post-medieval / modern?	2	NAI	20–50
Settlement, East Overcliffe Drive, Bournemouth	MDO8610	Iron Age	2	NAI	20–50
Settlement, East Overcliffe Drive, Bournemouth	MDO8611	Roman	2	NAI	20–50
Handaxe, Boscombe	MWX1247	Lower Palaeolithic	2	NAI	20–50
Bournemouth	MWX904	?	2	NAI	20–50
Handaxe, Marsham Court	MWX913	Lower Palaeolithic	2	NAI	20–50
Barrow, site of	MDO8582	Late Neolithic	2	NAI	20–50
Handaxes, Branksome Dene	MWX913	Lower Palaeolithic?	2	NAI	20–50
Site of SRDE, Friars Cliff, Christchurch	MWX1324	Modern	2	NAI	50–100
Coastal artillery battery, Avon run Road, Christchurch	MWX1324	Modern	2	NAI	50–100
Sandhills House, Mudeford	MDO15856	Post-medieval	2	NAI	50–100
The Anchorage, 157 Mudeford, Mudeford	MDO15858	Post-medieval	2	NAI	50–100
Pick, Mudeford	MWX1107	Mesolithic	2	NAI	50–100
NMR33.12 MACE / CAMPBELL	MDO8531	Palaeolithic	2	NAI	50–100
NMR33.12	MDO8632	Mesolithic	2	NAI	50–100
Bowl barrow	MDO8623	Early Bronze Age	2	NAI	50–100
Bowl barrow	MDO8625	Early Bronze Age	2	NAI	50–100
Earthwork	MDO8626	Neolithic	2	NAI	50–100
NMR?	MDO8643	Prehistoric	2	NAI	50–100
Hengistbury Head	MWX1092 NHLE 1002367	Scheduled Monument Lower Palaeolithic	2	NAI	50–100
Quarry,	MWX2798	Post-medieval	2	NAI	50–100
Unidentified mound (Hengistbury Head)	NHLE 1002367 MWX4751	Scheduled Monument ?	2	NAI	50–100
Unidentified mound (Hengistbury Head)	NHLE 1002367 MWX4752	Scheduled Monument ?	2	NAI	50–100
Unidentified mound (Bournemouth)	MWX4748	?	2	NAI	50–100
Axe find, Boscombe beach	MWX3787	Early Neolithic	2	NAI	50–100
Bournemouth	MWX882	?	2	NAI	50–100
Handaxe, Bath Road	MWX907	Lower Palaeolithic?	2	NAI	50–100
Hengistbury Head	NHLE	Scheduled Monument	2	NAI	50–100

	1002367 MWX1138	Late Iron Age				
Old Gravel pit, Flag Head Chine	MWX4327	Post-medieval		3	NAI	0–20
Unidentified English passenger vessel, 1759	MWX2369	Post-medieval		3	NAI	0–20
Pillbox	MWX1474	Modern		3	NAI	0–20
Low Light, The Sands, Poole	MWX4333	Post-medieval		3	NAI	20–50
Windmill	MDO6810	Post-medieval		3	NAI	20–50
King's Boat House, Carter's Quay, Hamworthy	MWX4824	Post-medieval?		3	NAI	20–50
Coastal artillery searchlight	MWX1460	Modern		3	NAI	20–50
Searchlight site, Brownsea Island	MWX3084	Modern		3	NAI	20–50
Dry dock & coastguard station, Brownsea Island	MWX3087	Post-medieval		3	NAI	20–50
Barnes Brickyard, Brownsea Island	MDO9732	Post-medieval		3	NAI	20–50
Hitchcock Brick & Tile Yard, Brownsea Island	MDO 7933	Post-medieval		3	NAI	20–50
Brickworks, Caroline Cliff, Brownsea Island	MWX3074	Post-medieval		3	NAI	20–50
Enclosure, Brownsea Island	MWX3081	?		3	NAI	20–50
Old gravel pit, South Shore Lodge, Brownsea	MWX4340	Post-medieval		3	NAI	20–50
Hailsham	MWX4623	?		3	NAI	20–50
Occupation site, Furzey Island, Poole Harbour	MDO7458 MWX3691	Iron Age or Roman		3	NAI	20–50
Gravel pit, Brownsea Island	MWX3076	Post-medieval		3	NAI	20–50
Flagstaff, The Sands, Poole	MWX4331	Post-medieval		3	NAI	50–100
High Light, The Sands, Poole	MWX4332	Post-medieval		3	NAI	50–100
Batter, Sandbanks	MWX2458	Post-medieval		3	NAI	50–100
Rowe's Warehouse	MWX1020	Post-medieval		3	NAI	50–100
The Jolly Sailor, The Quay, Poole	MWX2850 MWX2851	Post-medieval	Early medieval	3	NAI	50–100
Oyster shells, Poole Pottery, The Quay, Poole	MWX3834	?		3	NAI	50–100
Coal wharf, Poole	MWX4281	Post-medieval		3	NAI	50–100
Peat deposits & land reclamation, 71 Lake Drive, Hamworthy	MDO6960 MDO6983	? ?		3	NAI	50–100
The Boat House, Lake	MWX781	?		3	NAI	50–100

Drive, Hamworthy					
Clay pit, Hamworthy	MWX4240	Post-medieval	3	NAI	50–100
Lamp & pottery, Lake clay pits	MWX764	Romano-British	3	NAI	50–100
Old gravel pit, East Holton	MWX4471	Post-medieval	3	NAI	50–100
Clay pit, Russell Quay, Arne	MWX4109	Post-medieval	3	NAI	50–100
Saltworking site, Fitzworth Peninsula	MDO7460	Roman	3	NAI	50–100
Brownsea Castle	MDO7890	Post-medieval	3	NAI	50–100
Battery, Tudor Hill	MDO7926	Post-medieval	3	NAI	50–100
Coastal artillery searchlight	MWX1306	Modern	3	NAI	50–100
Extended defence officer's point	MWX1307	Modern	3	NAI	50–100
Gun emplacement	MWX1308	Modern	3	NAI	50–100
Gun emplacement	MWX1309	Modern	3	NAI	50–100
Searchlight building, Brownsea Island	MWX3085	Modern	3	NAI	50–100
Pottery, brick &tile works, Brownsea Island	MDO7931	Post-medieval	3	NAI	50–100
Pottery kilns, Brownsea Island	MWX3073	Post-medieval	3	NAI	50–100
Sand pit, Brown sea Island	MWX3077	Post-medieval	3	NAI	50–100
Clay pits, Brownsea Island	MWX4352	Post-medieval	3	NAI	50–100
Occupation, Green Island	MDO7454 MDO7456	Iron Age, Roman	3	NAI	50–100
Green Island	MDO7457	Roman	3	NAI	50–100
Pillbox	MWX1470	Modern	3	NAI	50–100
Pillbox	MWX1473	Modern	3	NAI	50–100
			4	NAI	50–100
Signal post, Ballard Down	MWX3104	Post-medieval	4	NAI	0–20
Stone axe, Ballard Down	MWX866	Prehistoric?	4	NAI	0–20
Coastal artillery battery	MWX1453	Modern	4	NAI	0–20
Gun emplacement	MWX1456	Modern	4	NAI	20–50
Rocket post	MWX4422	Post-medieval	4	NAI	20–50
Inhumations, Durlston House	MDO8010	Roman	4	NAI	20–50
Gun emplacement	MWX1455	Modern	4	NAI	20–50
Durlston Head Castle	MWX4330	Post-medieval	4	NAI	20–50
Battery, Peveril Point	MWX804	Post-medieval or modern?	4	NAI	20–50
Stone axe, Studland	MWX3089	Palaeolithic	4	NAI	50–100

Sand pit, Swanage	MWX4083	Post-medieval	4	NAI	50–100
Gun emplacement	MWX1454	Modern	4	NAI	50–100
Coastguard station, Swanage	MWX080	Post-medieval	4	NAI	50–100