

Rapid Coastal Zone Assessment Survey For South-West England - South Coast Dorset

Component One National Mapping Programme

English Heritage Project Number 6673



Historic Environment (Projects)

**Rapid Coastal Zone Assessment Survey
For South-West England
South Coast Dorset
Component One
National Mapping Programme**

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Cover illustration

Peeverill Point, Swanage. The partially submerged timber uprights of the original nineteenth-century Swanage pier are visible lying inside the modern pier. NMR 21620/13 15th April 2002. 21st Jun 1924. © Copyright English Heritage.

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Abbreviations

ADS	Archaeological Data Service
AMIE	English Heritage Archives and Monuments in England Database
AONB	Area of Outstanding Natural Beauty
BAP	Biodiversity Action Plan
CCO	Channel Coast Observatory
CUCAP	Cambridge University Committee for Aerial Photography
DTM	Digital Terrain Model
EH	English Heritage
EHA	English Heritage Archive
GIS	Geographical Information System
HBSMR	Historic Buildings and Site and Monuments Record
HER	Historic Environment Record
HLC	Historic Landscape Character
NCA	National Character Area
NHPCP	National Heritage Protection Commissions Programme
NIA	Nature Improvement Area
NMP	National Mapping Programme
NRHE	National Record of the Historic Environment
MNS	Map Note Sheet
OS	Ordnance Survey
PGA	Pan Government Agreement
PHHP	Poole Harbour Heritage Project
RAF	Royal Air Force
RCHME	Royal Commission on the Historical Monuments of England
RCZAS	Rapid Coastal Zone Assessment Survey
SAC	Special Area of Conservation
SSSI	Site of Special Scientific Interest
SWRCZAS	South West Rapid Coastal Zone Assessment Survey (Dorset)
UID	Unique Project Identifier
USAAF	United States Army Air Force
WHS	World Heritage Site

1 Summary

This report outlines the results of an archaeological survey involving the systematic interpretation, mapping and recording of archaeological sites from aerial photographs and lidar of a coastal and riverine strip of land in Dorset covering 265 square kilometres. The project forms component one of the South-West England Rapid Coastal Zone Assessment (Dorset to Hampshire).

The analytical aerial survey was carried out using English Heritage's National Mapping Programme (NMP) methodology.

The primary aim of the NMP component of the project was to provide a rapid baseline survey of the Dorset coast and thereby enhance understanding of the range of historic assets there in order to facilitate assessments of their significance and permit effective management of the resource.

The project achieved these aims by providing significant enhancement to existing baseline data through the mapping, interpretation and recording of 1734 archaeological sites of which 1303 were new sites, previously unrecorded in the Dorset HER.

Whilst no sites of Neolithic date were identified one possible Late Neolithic/Early Bronze Age penannular ring ditch was recorded for the first time during the project as well as 17 new Bronze Age round barrows. Although only small numbers of later prehistoric monuments were recognised (including four Iron Age, 19 Iron Age/Romano British and 14 prehistoric or Roman sites), the majority (62%) of sites attributed to these periods were new to the Dorset HER.

Like neighbouring Hampshire and Southern England in general, the early medieval period is poorly understood in Dorset. Only one site recorded during this project was attributed to this period: that of the already known early medieval defences at Wareham.

Sites relating to the later medieval period were also sparse with only 54 identified during the mapping; of these, 43% were new sites. All new sites were agricultural features such as field boundaries, field systems, cultivation marks and trackways.

Almost a third of all sites recorded were attributed to the post medieval or early twentieth-century periods. Until fairly recently this period has not been the primary focus for archaeological survey and field investigation and therefore 513 (93%) of sites were new to the record. The current project is perhaps one of the first to systematically record post medieval sites within the project area.

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 relating to the anti-invasion defences of this stretch of the Dorset coast being recorded for the first time.

This report describes the extent of the project area; the methodology used and gives an illustrative overview of the results of the aerial survey on a period by period basis.

2 Background to the project

2.1 Circumstances of and reasons for the project

This project was carried out under commission from English Heritage (EH). The Rapid Coastal Zone Assessment Survey Phase One Desk-based Assessment and National Mapping Programme for South-West England (South Coast Dorset to Hampshire) (SWRCZAS) forms part of a national programme initially designed to inform EH's responses to Shoreline Management Planning and the developing Defra 'Adaptation Strategy'. The project is split into two components: component one comprises the National Mapping Programme (NMP) survey; component two consists of the desk based assessment.

2.2 Background to the project

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 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.

Over recent decades it has been recognised by coastal managers and Government that the entire English coastline cannot be maintained in its present form through the 21st 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.

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).

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 Rapid Coastal Zone Assessment Surveys must be directed primarily towards these aims.

In 1997 English Heritage and the RCHME published a joint policy statement on the management of coastal archaeological remains (EH & RCHME 1996) and a nationally-based assessment of English coastal archaeology (Fulford *et al* 1997). These documents were followed by more specific guidance (EH 2003 and 2006). 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.

It is anticipated that there will be a Phase 2 Field Survey (the extent of which will be guided by Phase 1). However, funding for this fieldwork was not available during the current round of the National Heritage Protection Plan up to 2014. The results of the NMP component will feed into the desk based assessment and be integrated into the Dorset HER prior to work commencing on the desk based assessment.

An RCZAS has already been carried out for much of the English coastline and the south west of England is the last coastal area to be addressed by this initiative. The mapping project was financed through the EH National Heritage Protection Commissions Programme (NHPCP) and was carried out between March and November 2013.

2.3 Overview of NMP methodology

The NMP was initiated by the Royal Commission on the Historical Monuments of England (RCHME) in 1992. The aim of the NMP is 'to enhance our understanding about past human settlement, by providing information and syntheses for all archaeological sites and landscapes (visible on aerial photographs) from the Neolithic period to the twentieth century' (Bewley 2001, 78).

To achieve this aim a methodology was developed from previous selective approaches to mapping from aerial photographs (e.g. Benson and Miles 1974). The guiding principle of the methodology is 'to map, describe and classify all archaeological sites recorded by aerial photography in England to a consistent standard' (English Heritage 2010a and 2010b).

The NMP applies a systematic methodology to the interpretation and mapping of archaeological features visible on aerial photographs (Winton 2011). This includes not only recording sites visible as cropmarks and earthworks but also structures, such as those relating to twentieth century military activities. This comprehensive synthesis of the archaeological information available on aerial photographs is intended to assist research, planning and protection of the historic environment.

The SWRCZAS followed standard NMP methodology and involved the systematic examination of all readily available aerial photographs from the two important national collections held by English Heritage Archive (EHA) and the University of Cambridge (CUCAP). In addition digital aerial photographs and lidar held by the Channel Coast Observatory (CCO) were accessed via the internet. The online digital sources of aerial photographs held by Google Earth and Bing were also consulted.

Archaeological features were digitally transcribed using the AERIAL (Version 5.29) rectification programme and AutoCAD Map3D 2013 (infrastructure design suite). Each archaeological site was recorded directly into Dorset County Council's Historic Buildings, Sites and Monuments Record (HBSMR) database and supplied to EH in .pdf and .rft formats.

Full details of the project methodology are contained in Appendix 1.

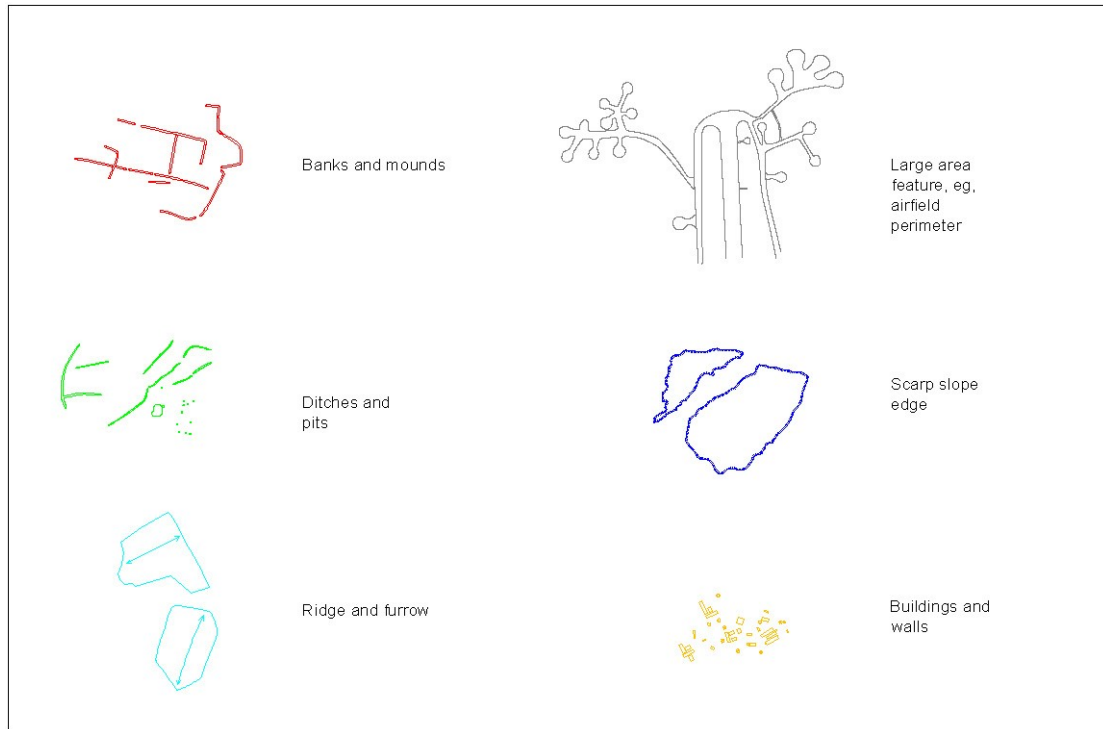


Figure 1. Conventions used on SWRCZAS (Dorset) NMP maps.

3 Aims and objectives

The main aim of the SWRCZAS was to improve knowledge of the archaeological resource of the project area.

The overarching aim of the National Mapping Programme is:

'to enhance our understanding about past human settlement, by providing information and syntheses for all archaeological sites and landscapes (visible on aerial photographs) from the Neolithic period to the twentieth century' (Bewley, 2001, 78).

Further aims and objectives specific to this project are set out below:

3.1 Aims

- The primary aim of the NMP component of the project 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.

3.2 Objectives

This aim was achieved through the following objectives:

1. Digital mapping of the archaeological landscape of the project area to current standards adopted by the National Mapping Programme.
2. Production and incorporation of baseline data into the Dorset HER and into Defra and the Environment Agency's Shoreline and Estuary Management Programme.
3. Integration of the data resulting from the project into the National Record of the Historic Environment (NRHE).
4. Publication and dissemination of the results of the project to raise awareness of the historic environment of the coast.

4 The project area

Part of the Dorset coast was mapped for the South Dorset Ridgeway NMP project (Royall 2011). Therefore within Dorset the project area comprised a coastal and riverine strip covering 265 square kilometres between Lyme Regis in the west and Highcliffe in the east (Figure 2). Much of the project area fell within the Dorset AONB (Area of Outstanding Natural Beauty), the western part included the Dorset and East Devon Jurassic Coast World Heritage Site; the Purbeck Coast including Poole Harbour is a Nature Improvement Area (NIA).

Mapping of complete one kilometre squares is the standard for NMP projects however for RCZAS projects mapping may be reduced in pre-war urban areas to the seaward side of a line drawn 100m inland from the mean high water. In the case of the Dorset SWRCZAS, the mapping area of Block 5 could have been reduced by 11km squares in the Bournemouth area: in the event, complete km squares were mapped.

The project area was divided into five working blocks.

- Block 1 Lyme Regis to Cogden Beach (30km sq).
- Block 2 Weymouth and Portland (60km sq).
- Block 3 Ringstead Bay to Poole Harbour (67km sq).
- Block 4 Poole Harbour (83km sq).
- Block 5 Bournemouth to Highcliffe (25km sq).

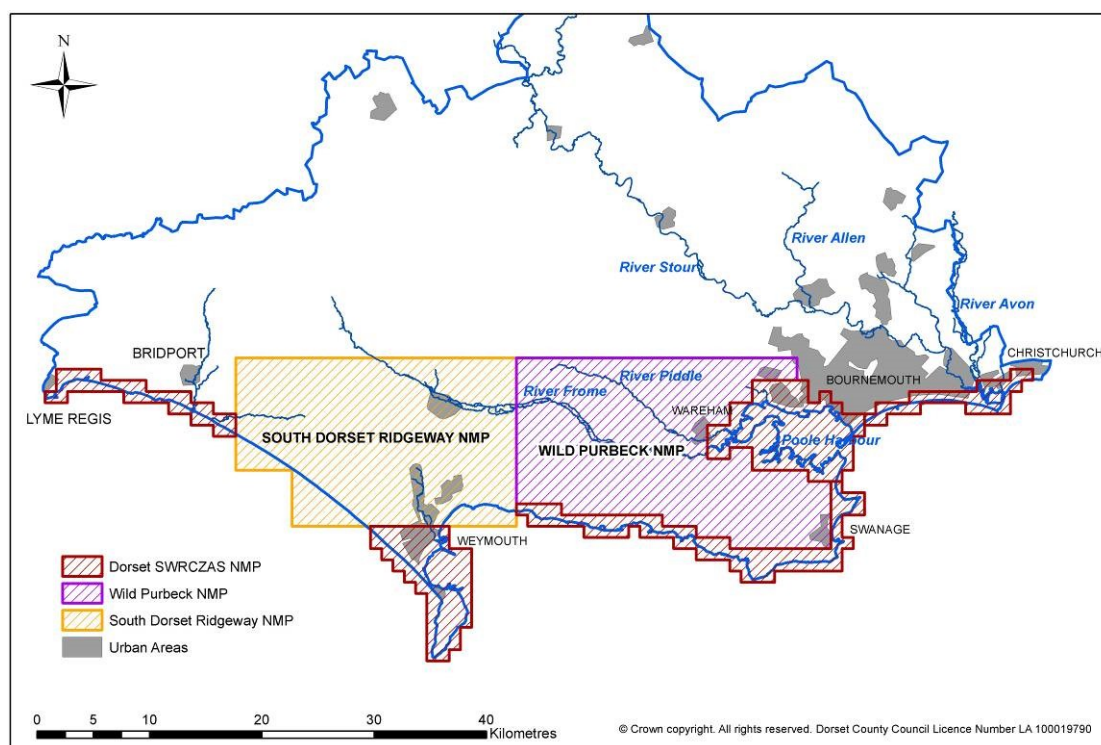


Figure 2. Map of Dorset showing the project area and other NMP projects in Dorset.

4.1 Jurassic Coast

The Dorset and East Devon Coast World Heritage Site covers 95 miles of coastline. Known as the Jurassic Coast, it was designated a World Heritage Site (WHS) in 2001 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 three major shingle structures in Britain. The great pebble barrier bank is 18 miles (29km) long and stretches from Abbotsbury to Portland in a straight line along the coast, enclosing the Fleet, a shallow tidal lagoon.

Much of the project area's coastal strip south and west of Studland is contained within the WHS with the main exceptions of Swanage Bay, Weymouth Bay and the southern half or Portland Harbour round to King's Pier, Portland. The width of the WHS varies considerably. It is narrowest along the high cliffs to the east of St Aldhelm's Head where it extends less than 10m inland and is at its widest along Chesil Beach west of Weymouth where it runs inland for over 1km to take in the Fleet lagoon. At the west end of the project area, the WHS extends 700m inland incorporating the extensive landslips known as The Spittles between Lyme Regis and Charmouth.

4.2 Area of Outstanding Natural Beauty

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 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 WHS. Large portions of the SWRCZA project area lie within the southern part of the AONB, particularly Blocks 1 (Lyme Regis to Cogden Beach) and 3 (Ringstead to Poole Harbour) and the southern portion of Block 4 (Poole Harbour) (Figure 3).

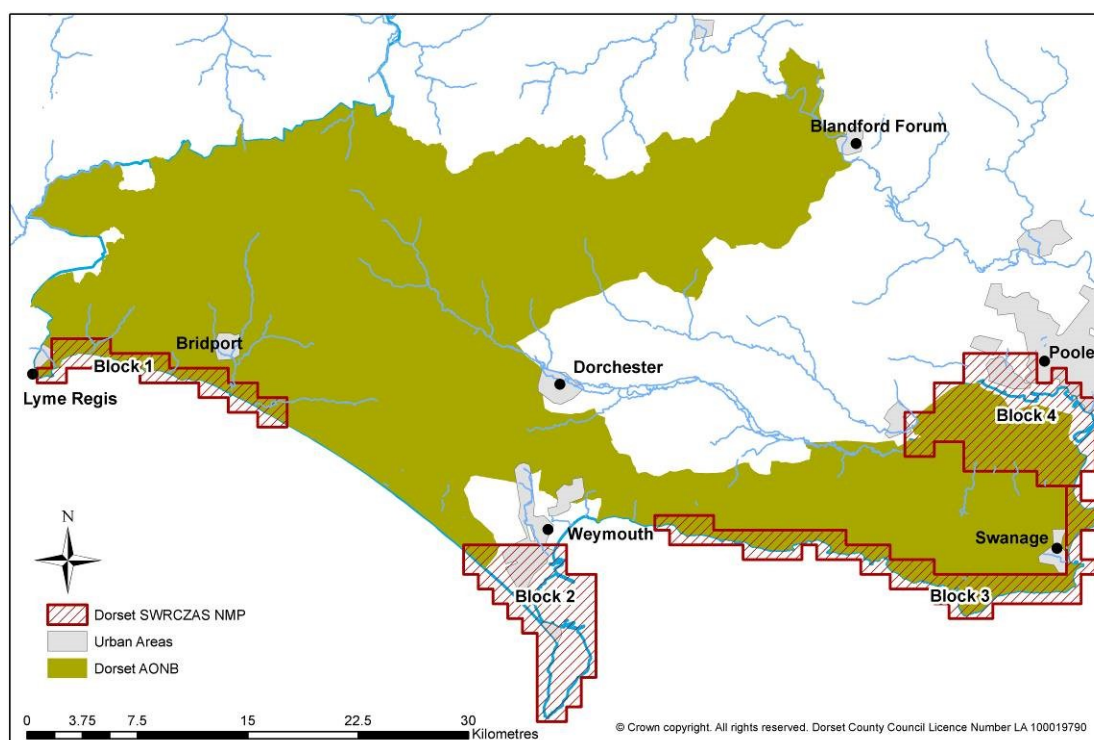


Figure 3. Dorset AONB and the Dorset SWRCZA NMP project area.

4.3 Geology

The underlying geology of Dorset is very varied, giving the county its diverse landscapes. 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 southeast. Throughout Dorset run a number of limestone ridges, the most notable of which is a wide band of

Cretaceous chalk which runs from the southwest to the northeast of the county underlying the Dorset Downs and forming part of the Southern England Chalk.

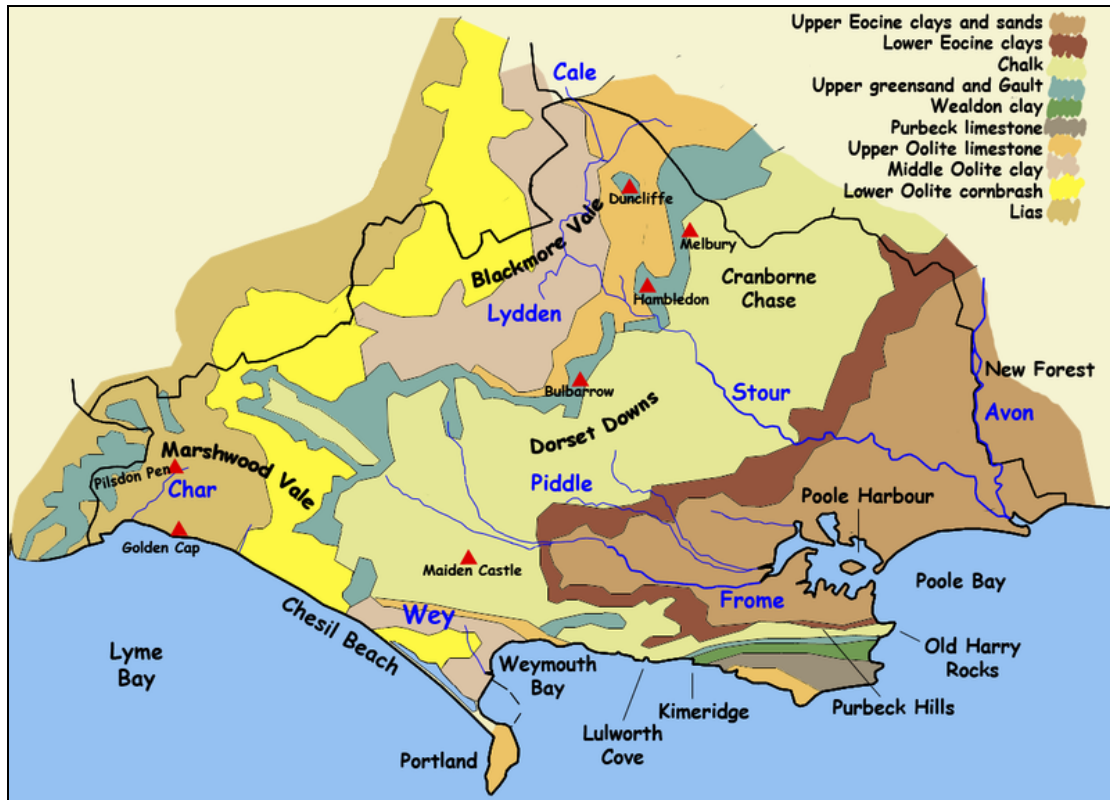


Figure 4. Map showing the simplified geology of Dorset
(Map produced by Steinsky 2007 with information based on Woodward 1904)

4.3.1 Block 1. Lyme Regis to Cogden Beach

Block 1 consists of 30km sq between the town of Lyme Regis and Cogden beach, to the southeast of Bridport. All of this area falls within the Dorset AONB and the Jurassic Coast WHS.

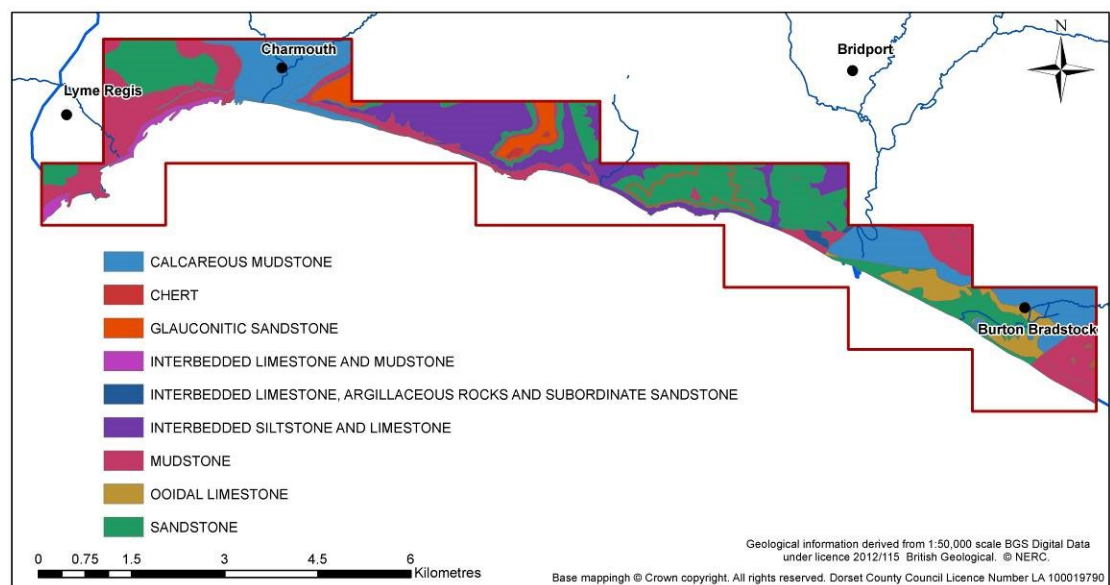


Figure 5. Block 1 Bedrock Geology

The western and eastern parts of this block are underlain by Jurassic rocks comprising mudstones and calcareous mudstones of the Lias Group, with Oolitic limestone and Bridport sandstone in the east. In the west there are Cretaceous sandstones of the Upper Greensand Formation. The central part of the block is underlain by Bridport sandstone and Jurassic siltstones and limestones of the Lias Group (Figure 5).

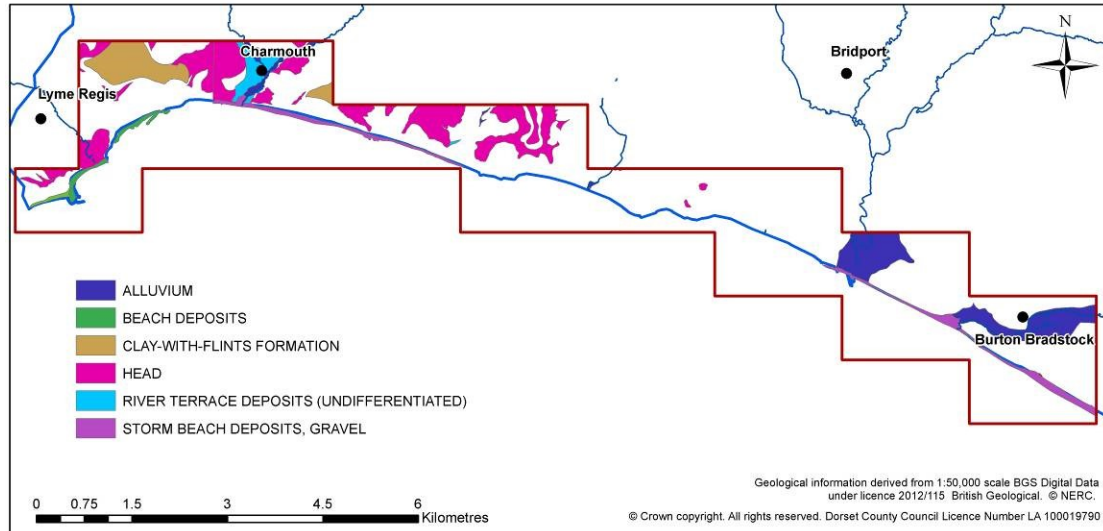


Figure 6. Block 1 Superficial Geology

In terms of superficial Quaternary geology, alluvial deposits lie in the valleys of the Rivers Char, Brit, Winniford and Bride. In addition undifferentiated river terrace deposits of clay, silt, sand and gravels lie within the valley of the River Char and its tributaries. Along the coastal strip, beach deposits of sand run for 3km along Lyme Bay between Lyme Regis and Charmouth and storm beach gravel deposits lie between Charmouth and Seatown and eastwards of West Bay, Bridport. Deposits of periglacial head lie inland of the coastal strip over much of the western half of the block. Two areas of clay-with-flint deposits overlie the sandstone hills of Timber Hill between Lyme Regis and Charmouth and Stonebarrow Hill to the east of Charmouth. Figure 6.



Figure 7. Mudslides, The Spittles, Lyme Regis.

2006 and 2009 photography © Channel Coast Observatory

The soft mudstones and calcareous mudstones of the Lower Jurassic Lias cliffs are rich in fossils which continue to be found as cliff erosion exposes fresh rock.

Landslides are a frequent occurrence in this part of Dorset, the largest area being between Lyme Regis and Charmouth in an area known as The Spittles. Figure 7 shows two Channel Coast Observatory photographs of the same stretch of coast, taken in 2006 and 2009. Fresh mudslides are clearly visible to the right of the 2006 image however the 2009 photograph shows a much larger mudslide to the west of the earlier slides. This mudslide took place in May 2008, (West 2014a).

4.3.2 Block 2. Weymouth and Portland

Block 2 covers 60km sq and includes much of the town of Weymouth, Portland Harbour and the whole of the Isle of Portland. The south eastern end of Chesil Beach and The Fleet fall within this block. This entire block lies within the Jurassic Coast WHS.

The underlying bedrock geology of Portland is primarily Jurassic limestone, Portland Stone, for which this area is well known. This Oolitic limestone has been much quarried, altering the coastline in places. Much of the rest of the block is underlain by Jurassic mudstone of the Kimmeridge Clay Formation along with narrow beds of interbedded siltstones, limestones, siltstones and mudstones (Figure 8).

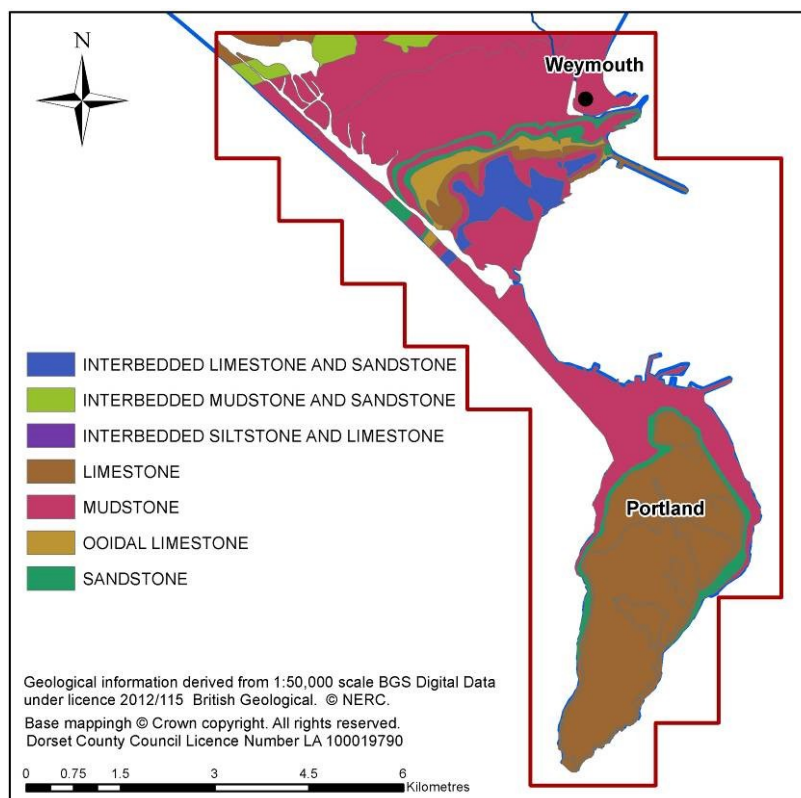


Figure 8 Block 2 Bedrock Geology

The Isle of Portland is the southernmost part of Dorset. It is a tied island connected to the mainland by a shingle spit or tombolo (a sandbar connecting an island to the mainland). The spit forms the eastern end of Chesil Beach which is a great Quaternary storm beach of rounded flint and chert. It runs for 18 miles with its western end located within Block 1 around Bridport. Immediately inland of Chesil Beach is the Fleet, a saline lagoon with associated tidal flat deposits of clay, silt and sand. Alluvial deposits north of Weymouth are associated with the River Wey and Radipole Lake. Small deposits of head are scattered across the mainland as well as towards the southern tip of Portland Bill. In addition, Portland Bill is notable in having an interglacial raised beach (Figure 9).

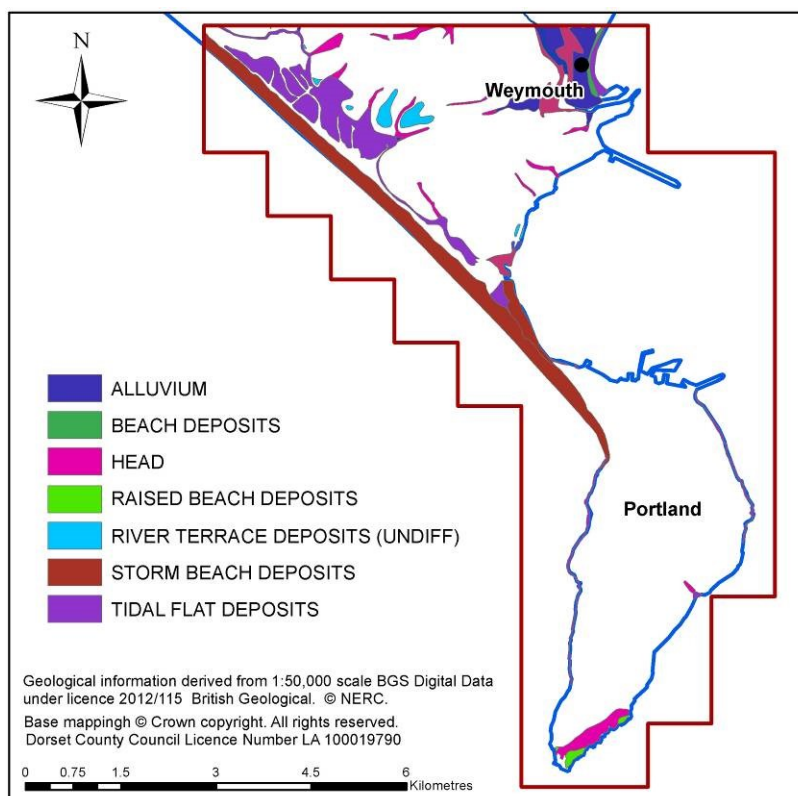


Figure 9 Block 2 Superficial Geology

4.3.3 Block 3. Ringstead Bay to Poole Harbour

Block 3 covers 67km sq of southern and eastern Purbeck, including part of the town of Swanage. The entire block falls within the Dorset AONB and the Jurassic Coast WHS.

In the west of the block the underlying bedrock geology is primarily chalk of the Culver and Portsdown Formations. Differential hardness (and therefore coastal erosion) of the east-west strata of the Purbeck Group mudstones, sandstones and limestones have given rise to the distinct coastal formations along the coastal strip between Durdle Door and Mupe Bay including Durdle Door itself and Lulworth Cove.

Mudstones of the Kimmeridge Clay formation underlie much of the central portion of the Block from Worbarrow Tout to St Aldhelm's Head. The Kimmeridge Clays are renowned as the oil rich source rock of the North Sea oil field; they are exposed on the surface in this part of Dorset. Small scale oil production has been undertaken in this area since Victorian times (West 2013b).

East of St Aldhelm's Head to Swanage, Portland and Purbeck Group limestones dominate, with softer mudstones and sandstones forming the back drop of Swanage Bay. North of Swanage Bay the harder Cretaceous Chalk, which underlies the South Dorset Ridgeway and much of the Dorset Downs (Figure 4), narrows to a band less than 1km wide forming the broad headland between Ballard Point and Handfast Point. Poole Formation silty clays and sands form the bedrock to the north east of the Block (Figure 10).

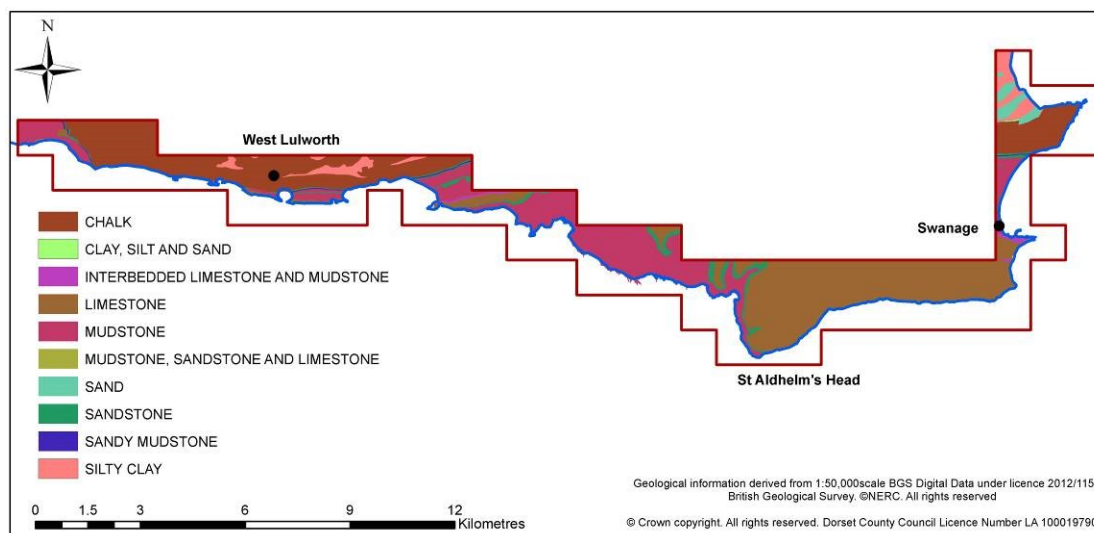


Figure 10 Block 3 Bedrock Geology

In terms of superficial Quaternary geology, here and there along the coast are deposits of head, with some clay-with-flint capping the western chalk to the north east of Ringstead Bay (Figure 11).

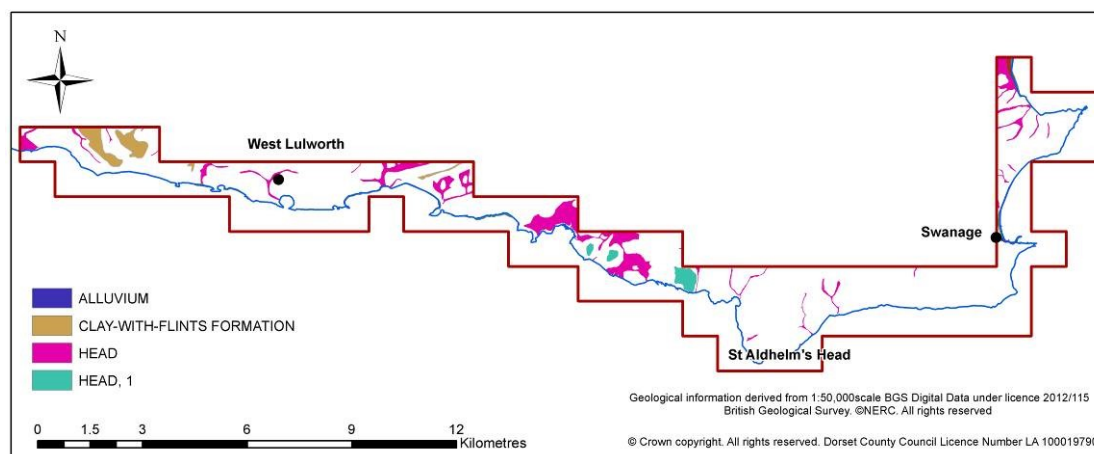


Figure 11 Block 3 Superficial Geology

4.3.4 Block 4. Poole Harbour

Block 4 covers a 83km sq area including the whole of Poole Harbour. The town of Poole and parts of Wareham and Bournemouth are located within the block.

The bedrock underlying Poole Harbour is a mixture of Middle Eocene clay, sands, silt and silty clays of the Bracklesham Group. A small area of Thames Group London Clay Formation clay, silt and sand is located in the north west corner in the vicinity of Lynchett Minster (Figure 12).

In terms of superficial deposits, much of the Poole Harbour basin is overlain by tidal flat deposits of gravel, sand, silt and clay. Alluvium lies in the lower valleys of the rivers Piddle and Corfe and in the small stream valleys to the south of the harbour where they empty into Ower Bay and Brand's Bay. On the north side of the harbour, larger deposits of alluvium are associated with the River Sherford entering Lytchett Bay. On the slightly higher ground above the tidal flats are extensive river terrace and head deposits.

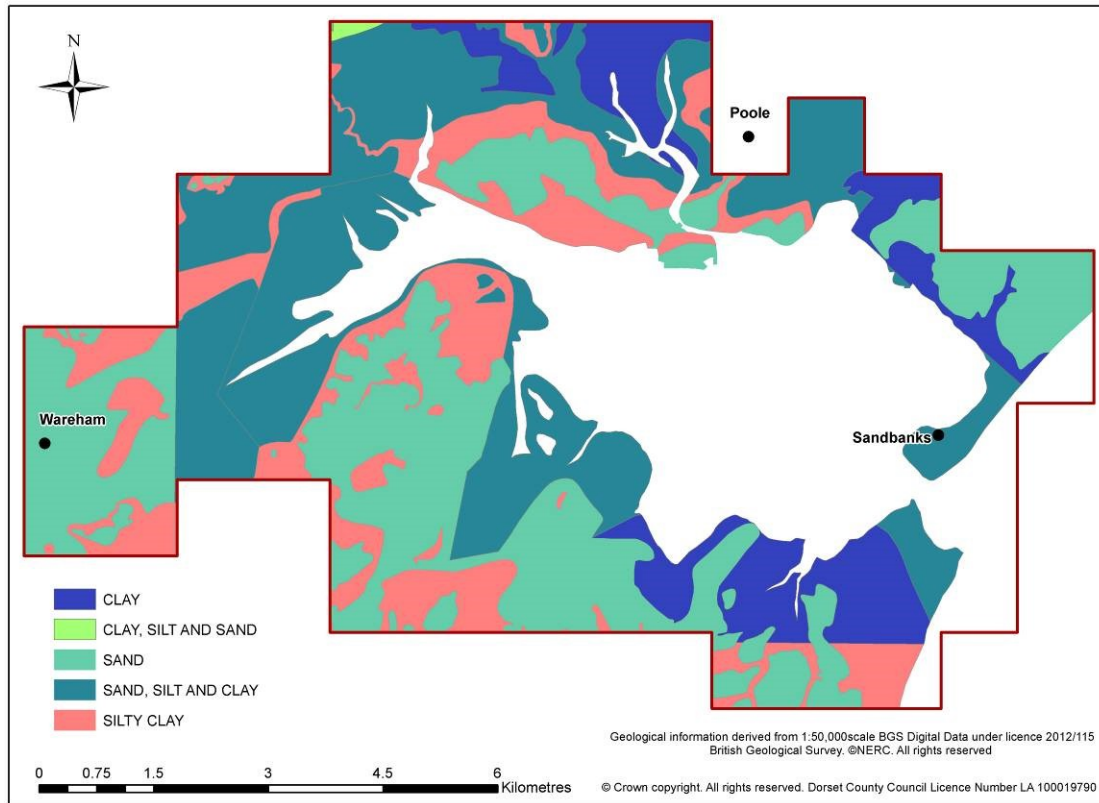


Figure 12 Block 4 Bedrock Geology

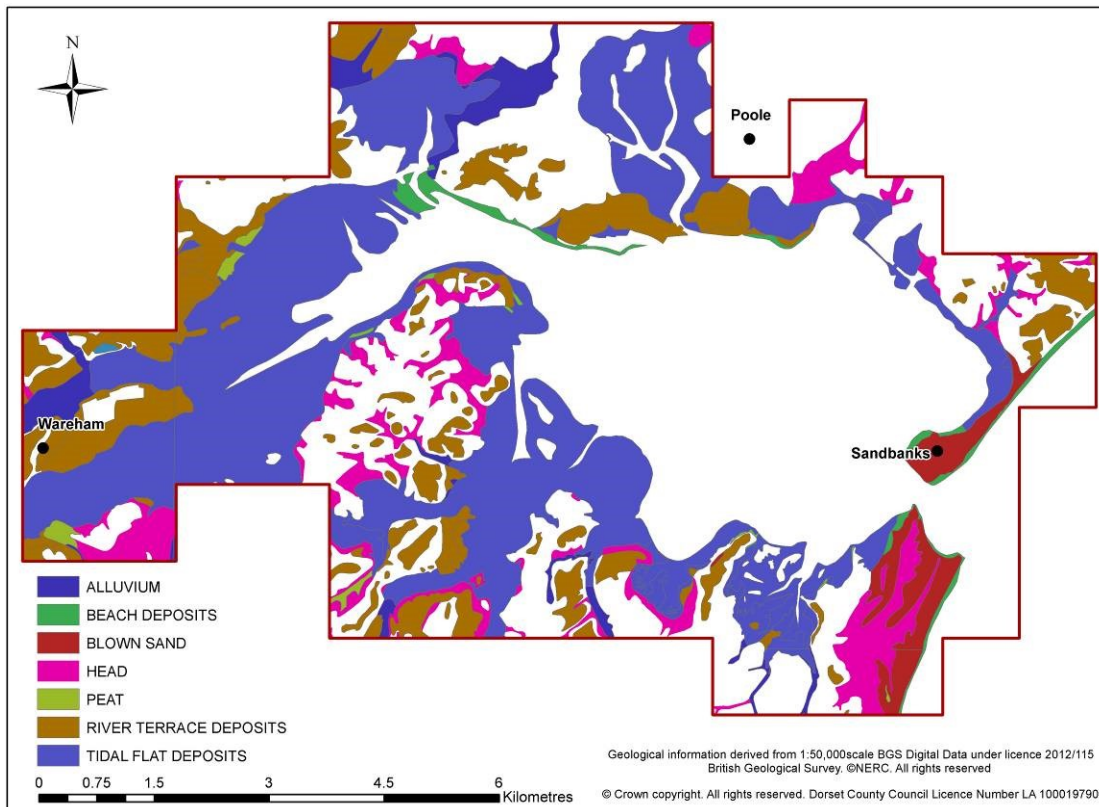


Figure 13. Block 4 Superficial Geology

Sandy beach deposits are located along the foreshore of Poole from Rockley Sands to Lower Hamworthy and to either side of Sandbanks and South Haven Peninsula. Sandbanks itself is a sand spit derived from the sand cliffs around Bournemouth and

transported by longshore drift. Coastal erosion and movement of the spit has been prevented with the construction of groynes in the late nineteenth century (West 2013c).

The central areas of Sandbanks and the South Haven Peninsula to the south are primarily blown sand. At South Haven, the strip of sand is 3.6km long and consists of three successive ridges which have built-up as recently as the sixteenth century (West 2013d).

4.3.5 Block 5. Bournemouth to Highcliffe

Block 5 comprises a 25km sq area from Poole Head to Highcliffe. The underlying geology is primarily Boscombe Sand Formation sand with two small isolated outcrops of Bracklesham Group clay at Branksome Chine and Canford Cliffs Chine. Further east underlying Hengistbury Head are clays associated with the Barton Clay Formation and Lyndhurst Member sand, silt and clays. Highcliffe itself is underlain by Barton Clay Formation clay.

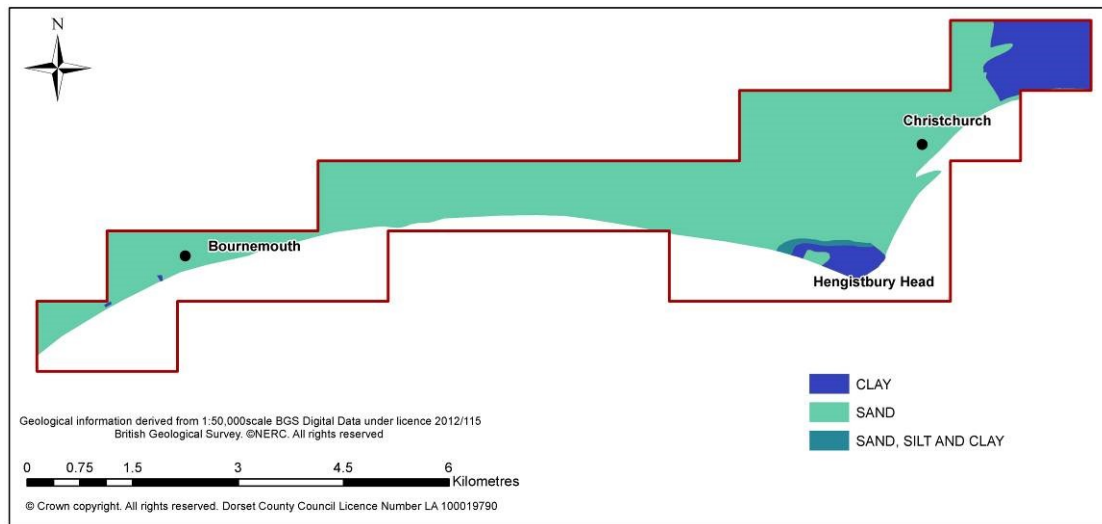


Figure 14. Block 5 Bedrock Geology

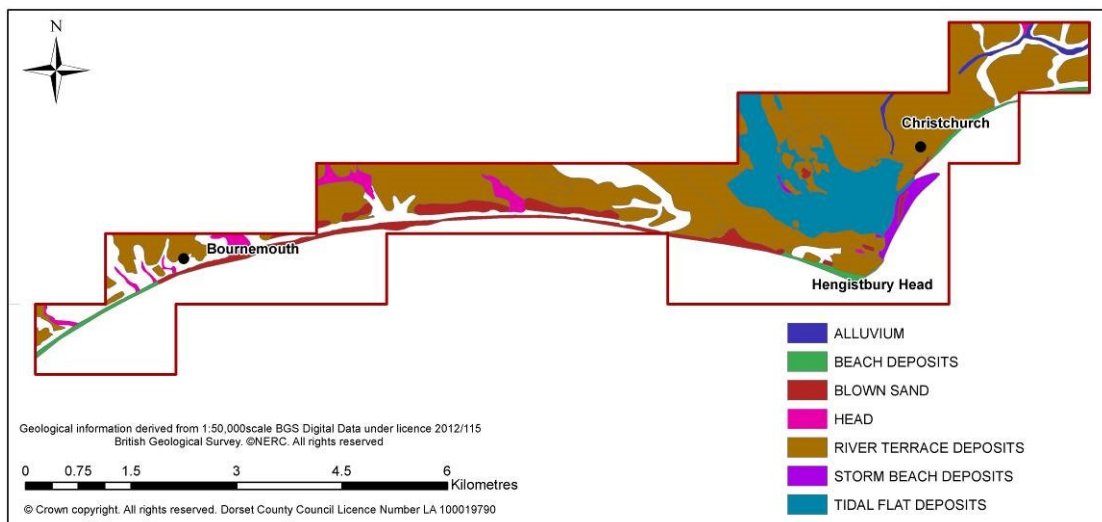


Figure 15. Block 5 Superficial Geology

The superficial geology of the area is dominated by Quaternary river terrace deposits and tidal flat deposits of gravel, sand, silt and clay within the estuary of Christchurch Harbour. Much of the coastline is bordered by sandy beach deposits and blown sand. Mudeford Spit forms the entrance to Christchurch Harbour and is formed of

gravel storm beach deposits and blown sand. Small isolated head deposits are scattered across the western half of the block whilst narrow deposits of alluvium lie in the small stream valleys to the north and east of Christchurch (Figure 15).

4.4 Landscape Character

A landscape character assessment was recently carried out of the entire county by Dorset County Council in partnership with the AONB. Within the county, 21 broad landscape character types have been identified based on broadly similar combinations of geology, topography, vegetation, land use and settlement pattern, (Figure 16). The following descriptions are based on data from Dorset County Council, 2013.

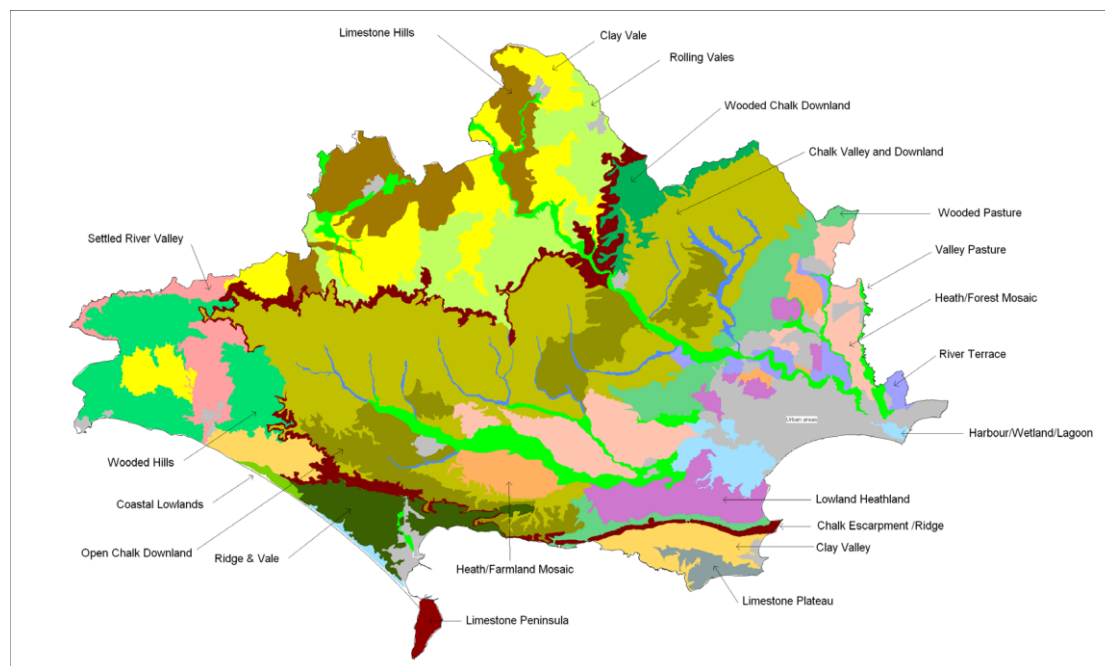


Figure 16. Dorset Landscape Character Types. (DCC 2013)

4.4.1 Character Types

Although a number of Landscape Character Types are contained within the project area, the most dominant types include:

Chalk Escarpment Ridge. This runs in a relatively narrow band to the south of the ‘Open Chalk Downland’ and defines the southern margin of the chalk landscape. Within the project area (Block3) the Purbeck Ridge is a prominent steep-sided chalk ridge with a mixture of arable and pastoral land use. Important areas of chalk grassland lie on the steep slopes with a patchwork of small pastoral fields on the lower slopes and scattered modern farmsteads located at the bottom of the scarp slopes along the stream line. Prehistoric barrows along with ancient hillforts dotted along the ridge-top form key landmarks.

Clay Valley. The clay valleys have a varied landscape of broad open valley and more secluded areas enclosed and defined by the dramatic chalk escarpments and ridges. Their patchwork of small scale rolling pasture fields, scattered woodland and scrub on steeper slopes has been shaped by centuries of agricultural improvement. Small farmsteads and villages are often hidden and scattered throughout the landscape. Two areas of Clay Valley lie within the project area: the Bride Valley east of Bridport (Block 1) and Corfe Valley (Block 3).

Harbour/Wetland/Lagoon. This character type is found in Poole and Christchurch harbours and the Fleet lagoon west of Weymouth. It is a mix of open water, shingle bank, marshland and mudflats with an undeveloped open character despite its proximity to large urban centres. It provides an important range of habitats of significant conservation value.

Limestone Peninsula. The Isle of Portland (Block 2) is a dramatic and distinctive peninsula at the end of Chesil Beach. It is an exposed and windswept landscape with little tree cover and an historic pattern of small fields enclosed with low stone walls. The Portland limestone underlies the landscape which is dominated by quarrying and military activity. Portland provides a barrier sheltering Portland Harbour and Weymouth Bay from storm waves coming from the west. In the north there are steep, rugged cliffs with immense fallen blocks of rock at their base. The plateau land slopes southwards, finally dipping into the sea at Portland Bill. Portland is famous for its military history and prisons, in particular the Verne Prison.

Limestone Plateau. Southern Purbeck between Durlston and St Aldhelm's Heads and inland to Worth Matravers is an exposed limestone plateau with a dramatic coastline of steep cliffs and incised deep valleys. A long tradition of quarrying has left a scatter of small quarries, spoil heaps and trackways in this windswept treeless landscape.

Lowland Heathland. A large area of lowland heathland lies to the south of Poole harbour (Block 3). This has an undulating lowland landform with poor sandy unfertile soils giving rise to a mosaic of heather, grassland, scrub and woodland.

Wooded Hills. This is a pastoral landscape with broad rolling hills, steep ridges, incised valleys and a dramatic coastline. Wooded valley sides are interspersed with a patchwork of dense hedgerows, winding lanes and small settlements. This is a dominant character area within Block 1; the Chideock Hills running down to the coast between Bridport and Lyme Regis. Along this part of the coast the landform is defined by a series of rounded greensand summits set around a network of winding sheltered clay valleys. These hills often form prominent landmarks, particularly Golden Cap - the highest point along the south coast. The River Char and several tributaries drain the Marshwood Vale and surrounding hills with several small streams found along the coast.

Wooded Pasture. Rolling wooded pasture lies to the south of the Poole Basin between the Lowland Heathland and the Chalk Escarpment of the Purbeck Ridge. It is characterised by an irregular patchwork of pasture, woods and hedgerows with many small villages linked by winding hedge-lined lanes.

4.5 Historic Landscape Character

An historic landscape character assessment has been carried out of the entire county by DCC in partnership with English Heritage. The HLC provides broad-brush comprehensive mapping of the typical historic cultural processes that shaped the present landscape. Although still in draft form, the data was supplied to the project by DCC and a brief summary described below. Figures 17 to 21 show the HLC at Broad Character Type level.

4.5.1 Block 1. Lyme Regis to Cogden Beach

This is an area of mixed historic landscape character. The towns of Lyme Regis and Charmouth are located to the west of the block with their associated recreational areas including a golf course, playing fields and holiday camp sites. Further east the block is of a generally more rural character with large areas of enclosed fields interspersed with the smaller villages and hamlets of Seatown, West Bay and Burton

Bradstock. Large recreational areas, primarily camp sites associated with tourism, dominate inland of the coastal areas (Figure 17).

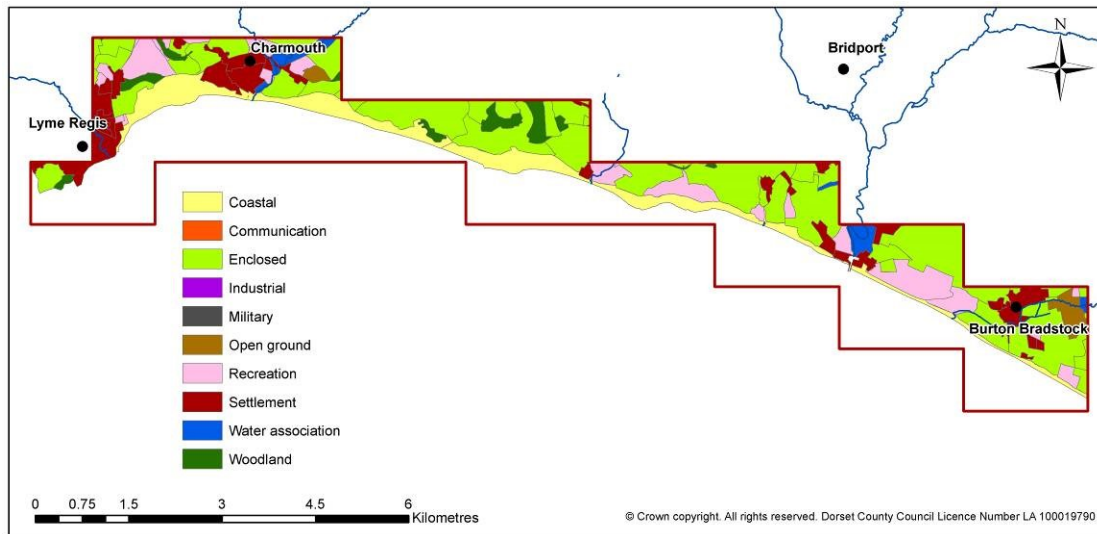


Figure 17. Historic Landscape Character of Block 1

4.5.2 Block 2. Weymouth and Portland

The northern portion of Block 2 is dominated by the urban area of Weymouth and its associated recreational and industrial areas. West of Weymouth, within the enclosed field pattern, lies a small military area comprising a firing range between Charlestown and Tidmoor Point. The shingle spit of Chesil Beach forms part of a broad coastal strip which also incorporates The Fleet lagoon.

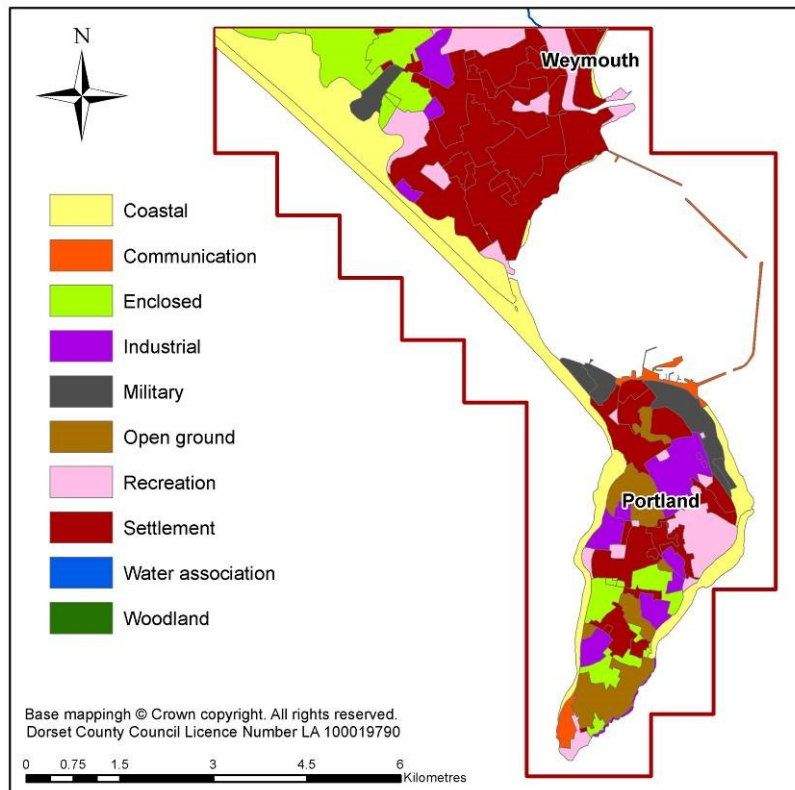


Figure 18. Historic Landscape Character of Block 2

The island of Portland is a mosaic of different broad character types including near equal measures of settlement, industrial, recreational, open ground and enclosed areas. To the north the historic naval base has been converted to a commercial port. Portland Harbour is now an important base for water sports and was used for the yachting events at the 2012 Olympics and Paralympics.

4.5.3 Block 3. Ringstead Bay to Poole Harbour

This Block has a mainly rural character, with small remote settlements lying within enclosed fields, scattered woodland and areas of open rough coastal grassland. A large military area to the west of West Lulworth forms part of the Lulworth Ranges. The two coastal towns of Swanage and Studland are located at the east end of the block and are associated with small recreational parks and beaches.

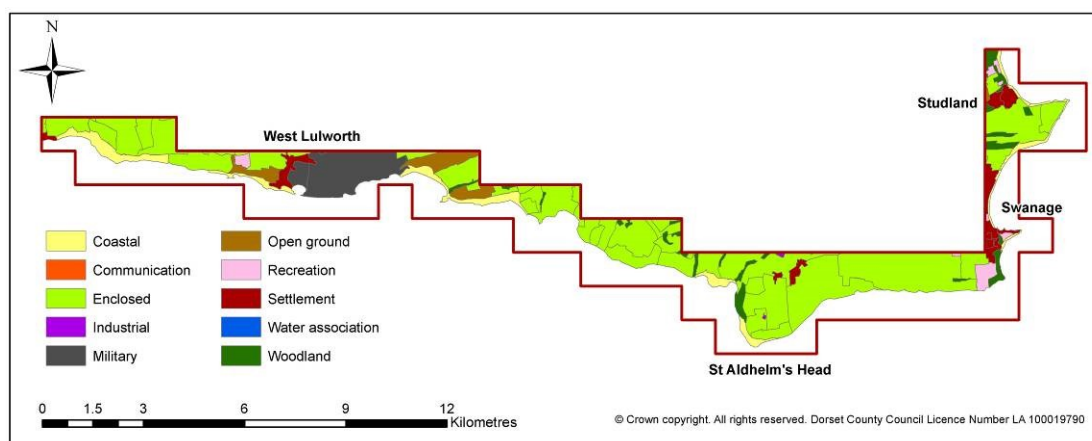


Figure 19. Historic Landscape Character of Block 3

4.5.4 Block 4. Poole Harbour

Poole Harbour itself covers 3,600ha. Its northern side is largely covered with settlement and associated recreational areas and industrial estates as well as harbour facilities including marinas. This is in sharp contrast to its western and southern reaches which remain a complex of enclosed fields, rough ground and woodland with mudflats, salt marshes, inlets and reed beds. Four rivers, the Frome, the Piddle, the Corfe and the Sherford drain into Poole Harbour from the west draining to the sea through the constricting headlands of North and South Haven (Sandbanks and Studland) in the east. The landscape around the tranquil fringes of Poole Harbour is one of undulating lowlands with extensive colourful heathlands.

Poole Harbour has been identified by English Heritage as one of the most important areas for coastal archaeology in England. Its continuous use, from prehistory to the present day, means that structures of almost any date could survive. It has been historically important as a commercial harbour since pre-Roman times. Bronze Age metalwork has been found within the entrance to the harbour. Early (Iron Age) riverine and coastal/seafaring activity has been demonstrated by finds of this period including a log boat, the Bulberry anchor and Iron Age activity on Green Island. The area contains a relatively high concentration of Protected Wrecks, including the sixteenth century vessel in Studland Bay and the seventeenth century Swash Channel wreck, as well as WWII Valentine tanks that are currently being considered for designation. Within the harbour there are also many twentieth century hulks, a collection of local craft (Poole Canoes) and a seaplane lighter, the first purpose built aircraft carrier. The harbour was a flying boat base during WWII and hosted some of the Schneider Trophy teams pre-war. Poole also has considerable WWII remains including 1940 defence works and 1944 invasion training structures.

The area has been inhabited since before the Iron Age and it contains a network of settlements, such as those located on Furzey and Green islands, which were exploiting mineral resources both within Poole Harbour and the Isle of Purbeck.

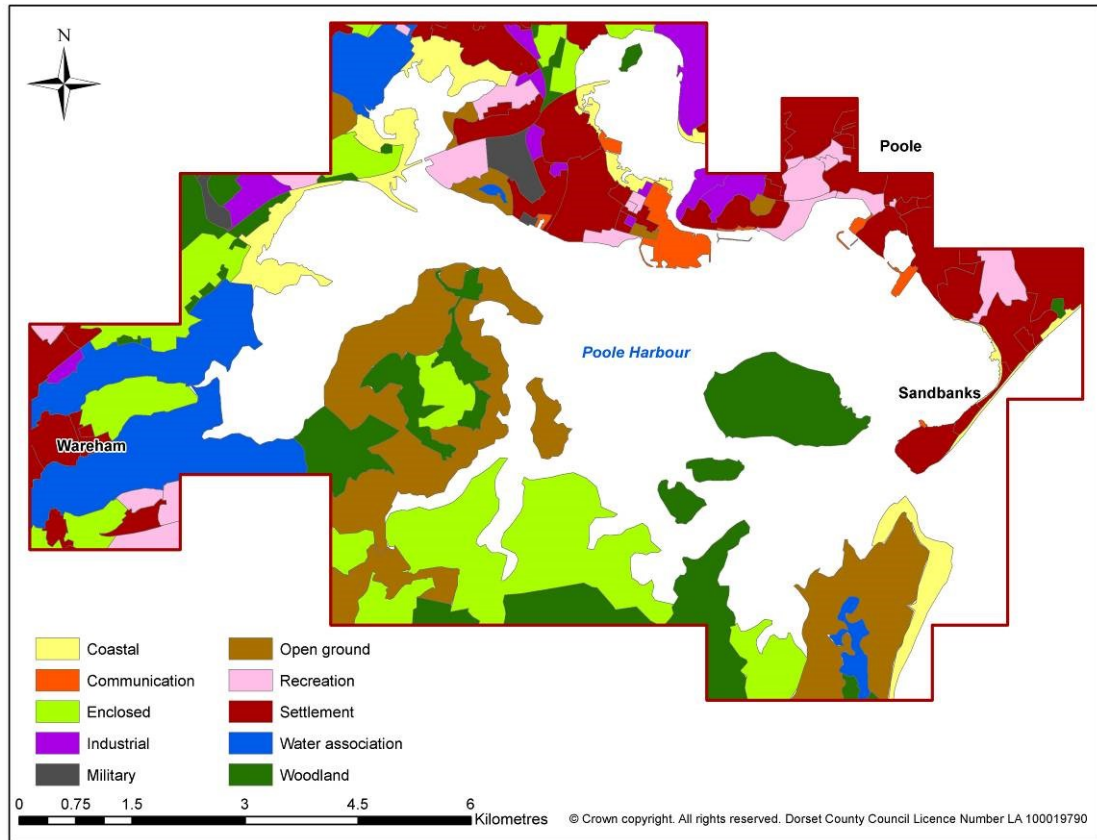


Figure 20. Historic Landscape Character of Block 4

4.5.5 Block 5. Bournemouth to Highcliffe

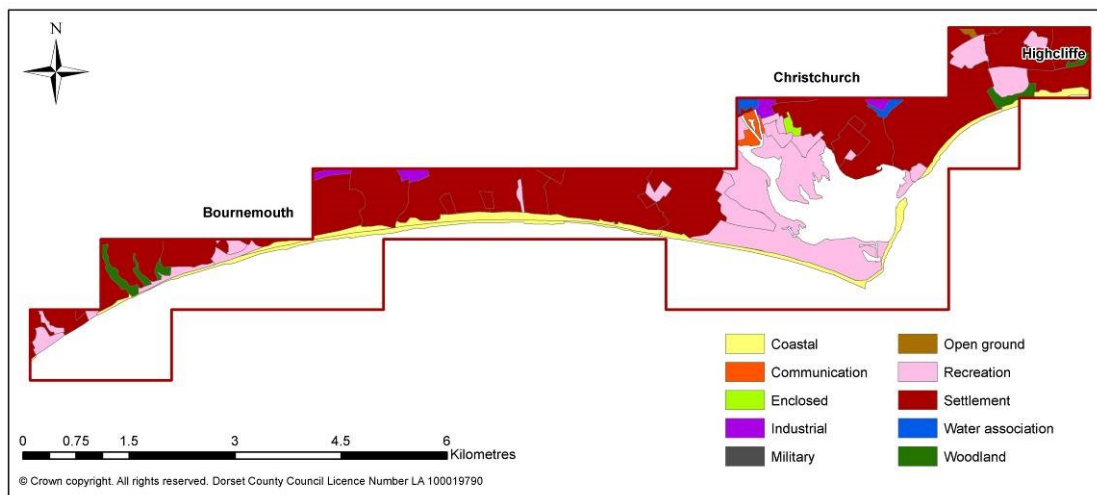


Figure 21. Historic Landscape Character of Block 5

This Block includes parts of Bournemouth, Christchurch and Highcliffe and is largely settlement related in character. Recreational areas form the bulk of the remaining landscape with urban municipal parks and coastal spaces such as promenades. Large parts of Christchurch Harbour and Hengistbury Head are now nature reserves

Hengistbury Head and its associated area is a Scheduled Monument with a number of Bronze Age round barrows and Iron Age earthworks including the Double Dykes. There are also important scheduled monuments within Christchurch, including the Bridge, Monastery and the old town walls.

4.6 National Character Areas

The project area includes six National Character Areas (NCA) as defined by Natural England (2013). From west to east these are:

4.6.1 Blackdowns (NCA 147)

The Blackdowns NCA runs from Charmouth to Sidmouth and inland to Blagdon Hill. The area is characterised by a trend of rivers, valleys and ridges. The ridges tend to be flat-topped with abruptly falling valley sides. The coastal landscape consists of erosional cliffs. The poor soils on the higher ground are generally covered by heathland and forestry, the steep valleys enclosing a predominantly pastoral landscape.

4.6.2 Marshwood and Powerstock Vales (NCA139)

This NCA runs along the coast from Charmouth to West Bay and inland to Beaminster. Inland the clay vale is surrounded by a diverse landscape of high ridges and small conical hills divided by steep valleys. Slumped mobile cliffs with prominent headlands and hidden valleys characterise the coastal landscape. The land is predominantly grass and uncropped land with small areas of woodland.

4.6.3 Weymouth Lowlands (NCA138)

The Weymouth Lowlands form a significant coastal landscape. The area is dominated by the pebble barrier of Chesil Beach which is separated from the mainland of open lowlands the saline water area of the Fleet Lagoon. Inland, small ridges and broad vales provide a gradual transition to the Dorset Downs. The characteristic features of this NCA include an open, largely treeless landscape of large, commonly arable, fields and an exposed, windswept grassland coast. There is an extensive urban and urban fringe land use around Weymouth.

4.6.4 Isle of Portland (NCA137)

The Isle of Purbeck is a tied island connected to the mainland to Chesil Beach. The underlying geology gives rise to calcareous grassland, a Biodiversity Action Plan (BAP) priority. The habitats of the west side of the Isle, extending into Chesil Beach and the Fleet, are of international importance and designated a Special Area of Conservation (SAC). Portland is quite densely populated with substantial villages dominating the landscape along with quarries, industrial buildings and spoil heaps.

4.6.5 South Purbeck (NCA136)

South Purbeck NCA is a compact but highly diverse landscape. It includes: the Purbeck chalk ridge, the Corfe and Swan Vales, the coastal slope at Kimmeridge and gently rolling chalk downland around Chaldon Herring. The coastal habitats are principally grasslands many of which are Sites of Special Scientific Interest (SSSI) and SACs. The land use is overwhelmingly agricultural, comprising a mosaic of pastoral, arable and semi-natural habitats.

4.6.6 Dorset Heath (NCA135)

The Dorset Heath NCA covers a broad area between Studland and Hengistbury Head and inland to Beckhampton in the west and Fordingbridge to the north. It takes in the entire Poole Basin and the lower river valleys of the Frome, Piddle, Stour and

Avon. Twenty three per cent of the area is wooded and the remainder mainly a very open and largely pastoral landscape. The Poole/Bournemouth/Christchurch conurbation lies within this NCA.

5 Overview of the aerial photographs

Nearly 90 years of aerial reconnaissance has taken place in Dorset and this has ensured that there is extensive aerial photographic cover of the county. Available aerial photographs include specialist oblique photography, some taken in the 1920s by OGS Crawford, Major Allen and Alexander Keiller. Extensive programmes of vertical photography were carried out by the Royal Air Force (RAF) in the years during and after the Second World War. Blanket vertical cover has continued up until the present day, initially by the Ordnance Survey (OS) in the 1960s and later from the 1970s onwards by DCC and the OS. The coastal area has also been flown by the Channel Coast Observatory (CCO). These more recent sorties have resulted in digital colour images.

The primary source of aerial photographs used during the course of this project was the EHA collection in Swindon; in all over 10,000 prints and digital images were loaned from this collection. The Cambridge University collection (CUCAP) was also consulted and a small selection of their photographic prints made available as loans. In addition, digital photographs from the Channel Coast Observatory, Google Earth and Bing were accessed via the internet. Dorset CC provided digital aerial photographs dating from 1972, 1997 and 2002. Pan Government Agreement geo-referenced digital aerial photographs provided by EH were also available. Details of photographs used during the project are contained in Appendix 1.

5.1 EPW digital photographs

The earliest oblique aerial photographs consulted during the project are from the EH Aerofilms Collection, the many of which date to April 1920. A large number of these images are low-level panoramic shots of the coastal towns of Bournemouth, Poole, Weymouth and Lyme Regis and as such are of limited archaeological value but great historic interest.



Figure 22. Bournemouth Pier in April 1920

Photograph:

EPW000253 April 1920.
© English Heritage
(Aerofilms Collection).

5.2 Crawford Collection photographs

The earliest oblique aerial photographs taken for archaeological purposes are from the EH Crawford Collection. Whilst exact dates are not available for all of these prints, they were taken or collected by Crawford and others in the 1920s and 1930s and formed the basis of Crawford's first archaeological transcriptions using aerial photographs (Crawford 1923, Crawford and Keiller 1928). The earliest dated prints from the Crawford Collection of the project area are from 7th August 1923.

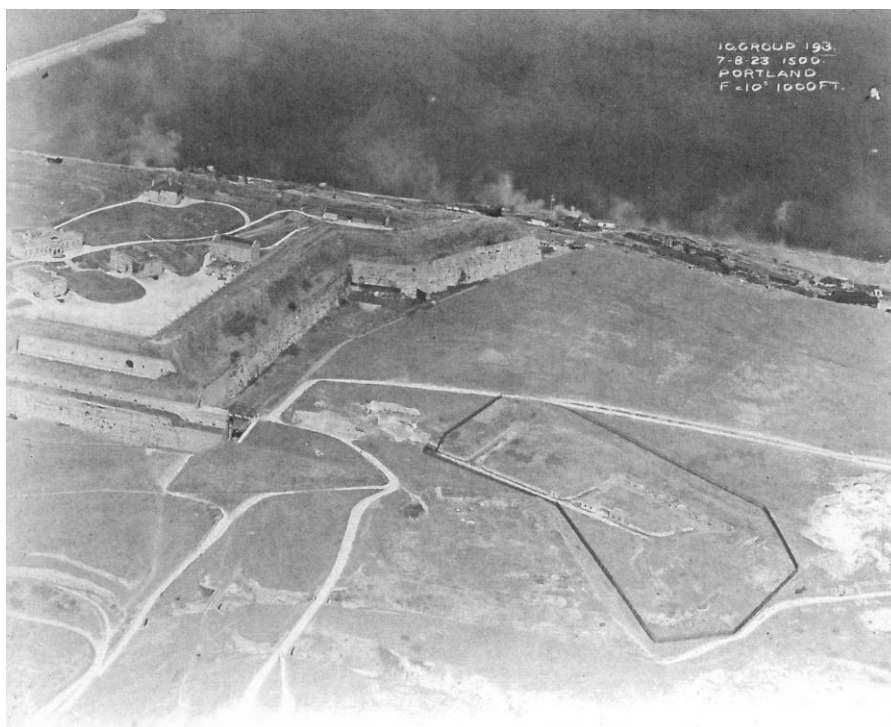


Figure 23. Nineteenth century High Angle Battery to the south of The Verne Citadel in 1923

MDO6569. Photograph: CCC 8612/811 7th August 1923. © English Heritage (Crawford Collection).

5.3 Specialist oblique photographs

The Cambridge University Committee for Aerial Photography (CUCAP) has undertaken an aerial reconnaissance programme since 1947. Where possible these photographs were consulted. However loans to the project from the collection were restricted to 100 prints. Delays in processing these loans meant that the CUCAP collection was only consulted for Blocks 2 to 5. A small number of duplicate prints from the collection were also available to the project via the EHA collection.

A systematic programme of reconnaissance has been carried out by the Royal Commission on the Historic Monuments of England, latterly as part of English Heritage, since the 1970s. The photographs from this and others collected by the National Monuments Record (NMR), now EHA, provided the bulk of the oblique coverage.

Oblique photographs taken in slanting sunlight (either during the winter months or in the early morning or late evenings of summer) are an ideal medium for defining earthwork monuments. Figure 24 shows the fragmentary remains of a prehistoric settlement and field system on St Aldhelm's Head. The earthworks are clearly picked out in low February sunlight. In the field to the bottom right of the image, the lynchets have been levelled by ploughing but are visible as germination marks. Later post medieval extractive pits are scattered across the area.



Figure 24. The fragmentary remains of an Iron Age/Romano British settlement and field system on St Aldhelm's Head picked out in low February sunlight.

MWX616. Photograph: NMR 18720/12, 21st February 2000. © English Heritage.

5.4 Vertical photographs

Vertical photographs provide coverage of all parts of the project area and have been taken at regular intervals from the early 1940s onwards. As part of the routine NMP process all readily available vertical aerial photographs (with the exception of the digital cover) were examined with a hand-held stereoscope. Viewing prints with a stereoscope provides a three dimensional view of the landscape, including any extant archaeological features. The advantage of vertical photography is that large areas are usually surveyed; a potential disadvantage is that they are not always taken at the most favourable times of day or year to maximise the visibility of archaeological features. Nonetheless the value of vertical photography to the project cannot be overstated.

A good range of sources of vertical photography were available to the project, and as a result a wide variety of archaeological site types were recorded. RAF vertical photographs from the 1940s to the early 1960s were an important source of information, particularly for sites relating to twentieth century military features.

The provision of a wide variety of sorties in addition to the RAF coverage (the DCC digital aerial photo tiles, the OS and the Meridian Airmaps (MAL) collections) ensured that coverage from vertical photography was extremely good. In addition up to date digital colour photographs were available online from the CCO as well as through Google and Bing.



Figure 25. Second World War military camp, Barrow Camp, Chickerell.

Practice slit trenching and the sites of temporary bell tents are visible on this photograph taken soon after the end of the Second World War. *MDO2985*. Photograph: RAF 106G/UK/1411 Frame 4055, 13th April 1946. English Heritage RAF Photography.

Using the historical RAF verticals in combination with modern images allows a direct comparison of the state of preservation of archaeological sites over time. Whilst many of the monuments on the Dorset coast are still extant features in the landscape, unfortunately many sites which were visible as earthworks in the 1940s have been partially or completely levelled and are now visible as crop or soil marks (Figures 26 and 27).



Figure 26. Celtic field system at Chideock Farm, Chaldon Herring taken in 1946

Whilst suffering from the plough in places, the Celtic field system at Chideock Farm, Chaldon Herring was still in relatively good condition at the time these RAF photographs were taken in 1946 (*MDO7285*).

Photograph: RAF
CPE/UK1841 Frame
2439, 4th November
1946. English Heritage
RAF Photography.



Figure 27. Celtic field system at Chideock Farm, Chaldon Herring taken in 2002

Throughout the latter half of the twentieth century the lynchets of the Chideock Farm field system suffered severe attrition from the plough. By 2002, when this photograph was taken, portions of the field system appeared almost completely levelled and only visible as soilmarks and cropmarks. (MDO 7285)

2002 Photograph mosaic: SY7980.ecw and SY7981.ecw, © Dorset CC.

5.5 Military oblique photographs

A number of military oblique photographs were available for the study area. These were from sorties taken by the RAF between 1941 and 1959. Along with the RAF vertical photographs, these were particularly useful sources of information concerning twentieth century military features.



Figure 28. Second World War chain home radar station at Hengistbury Head, Bournemouth.

MDO28870. Photograph: RAF PFFO: 540/307 Frame 0183, 8th April 1950. English Heritage RAF Photography.

5.6 Lidar

Light Detection and Ranging (lidar) is an airborne mapping technique which uses a laser to measure the distance between the aircraft and the ground. The technique allows the identification and recording of upstanding features on the ground to sub-metre accuracy. The benefits of using lidar for archaeological recording have been previously recognized (Bewley *et al* 2005, Devereux *et al* 2005, Royall 2011 and Royall 2013). The data generated by this current project has further proved the value of lidar as an archaeological survey tool.

Lidar data was available for much of the project area from the Channel Coast Observatory. This data was taken between 2005 and 2011 and available as ascii grid (.asc) files which were viewed and modeled in AutoCAD. Data from 2008 and 2011 proved most valuable; the 2008 data was captured from 1m grid with an estimated accuracy of +/- 15cm and the 2011 data from a 0.50cm grid.

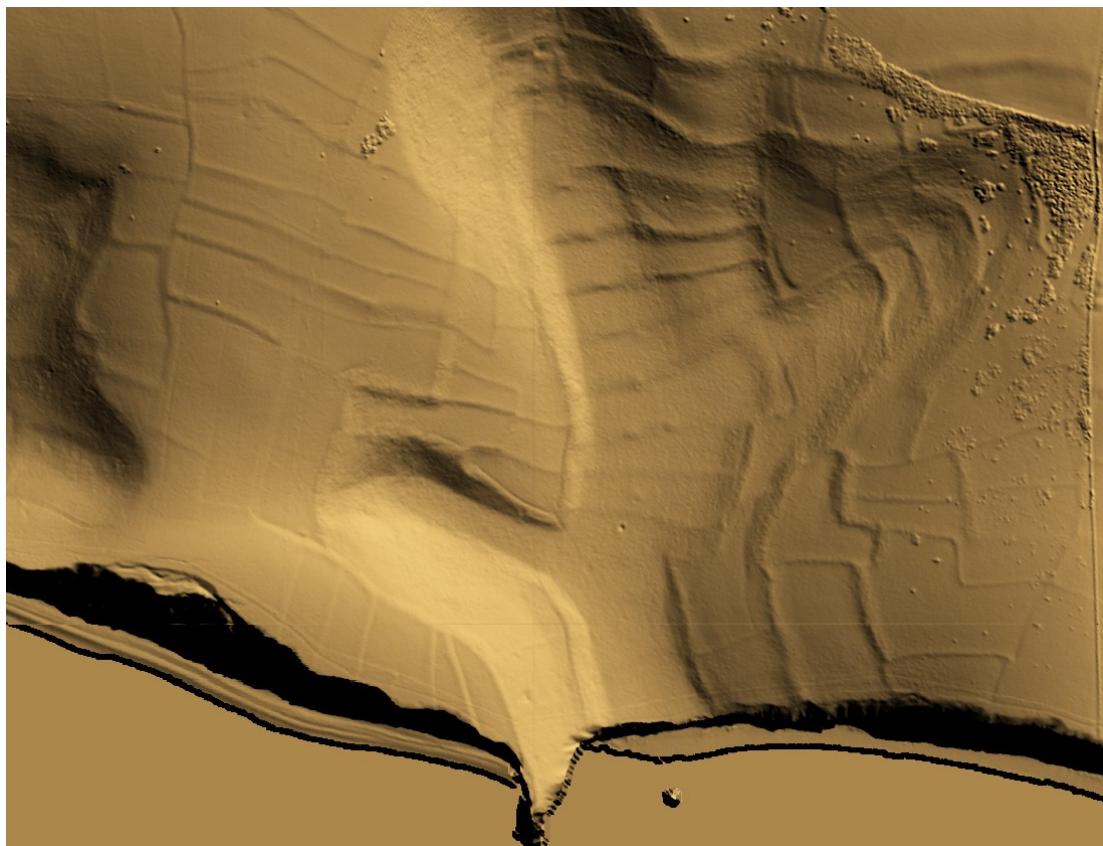


Figure 29. A later prehistoric field system, The Warren, West Lulworth. The low earthwork banks are clearly visible on Channel Coast Observatory lidar taken in 2008.

MDO8266. © Cornwall Council 2013 based on Channel Coast Observatory data 2008.

6 Results of NMP mapping

6.1 Numbers of previously known sites in the project area

Prior to the mapping, the English Heritage Archives and Monuments in England (AMIE) database contained 1902 records for the project area. In addition, the Dorset Historic Buildings Sites and Monuments (HBSMR) contained 5805 sites within the project area. Many of these HBSMR records were for find spots, place names and extant buildings (site types which are outside of the NMP remit).

Of the 5805 sites listed in the HBSMR, 899 were maritime records (generally wrecks) and 2285 were for features recorded as Record Type 'monument'. These are sites potentially visible on aerial photographs such as cropmarks and earthworks as well as structures and subsurface features (including excavated features) and within the NMP remit. Figures 30 through to 34 show the distribution of those records existing prior to the NMP project in the Dorset HBSMR and EH national AMIE databases.

Block 1. Block 1 was largely of a rural character, the small urban centre of Lyme Regis located at its western end. Prior to the mapping, the AMIE database contained 214 records for Block 1. The Dorset HBSMR contained 810 records of the same area over half of which were for listed buildings. Three hundred and thirty two HBSMR records were for sites within the NMP remit including 102 wrecks and 230 monuments, (Figure 30).

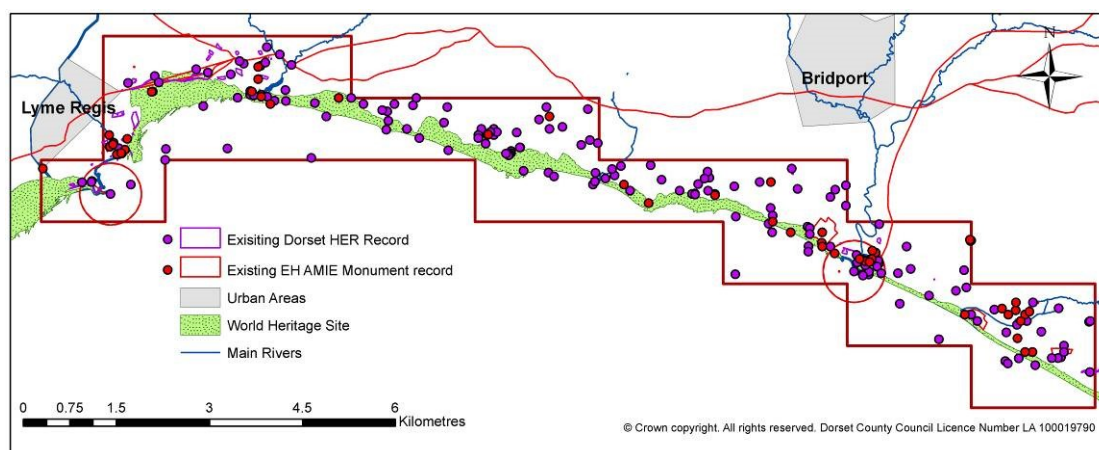


Figure 30. Block 1: Distribution of pre-existing AMIE records and Dorset HBSMR records (Monument (MON) and Maritime (MAR) records only).

Block 2. Block 2 contained the urban centre of Weymouth with its strategically important harbour. Large numbers of buildings and wrecks associated with this significant maritime port are listed in the existing databases. Prior to the mapping the AMIE database contained 731 records within Block 2. The Dorset HBSMR contained 2113 records of which 832 were listed building records and 416 were for maritime records, generally wrecks. In addition to the maritime records, the HBSMR contained a further 725 monument records of the project area for sites potentially within the NMP remit (Figure 31).

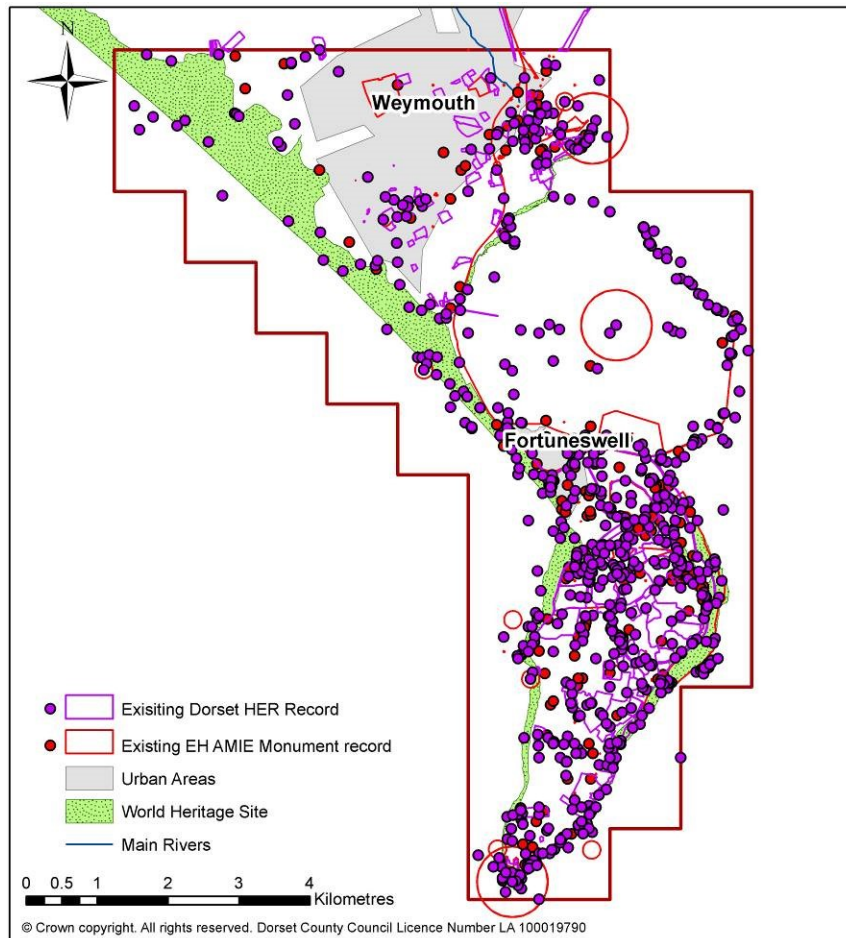


Figure 31. Block 2: Distribution of pre-existing AMIE records and Dorset HBSMR records (Monument (MON) and Maritime (MAR) records only).

Block 3. Block 3 was largely of a rural character, the small urban centre of Swanage located towards the eastern end. Prior to the mapping the AMIE database contained 357 records for this block. The Dorset HBSMR contained 755 records of which 101 were building records and 158 were for maritime records, generally wrecks. In addition to the maritime records, the HBSMR contained a further 436 monument records of the project area for sites potentially within the NMP remit, (Figure 32).

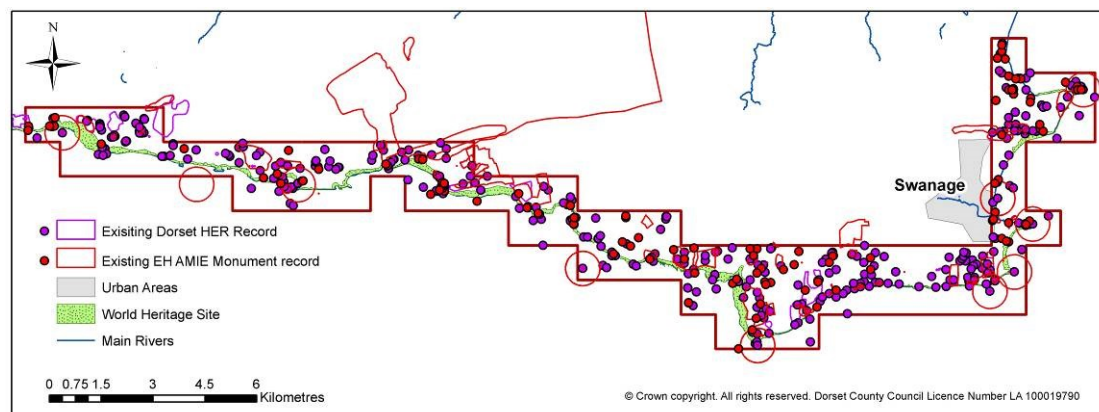


Figure 32. Block 3: Distribution of pre-existing AMIE records and Dorset HBSMR records (Monument (MON) and Maritime (MAR) records only).

Block 4. Much of this Block was dominated by the intertidal Poole Harbour and the urban centres of Poole and Bournemouth along its northern fringe. Prior to the

mapping project the AMIE database contained 412 records for this block. The Dorset HBSMR contained 1626 records, a large portion of which (646) were for building and listed building records. 868 HBSMR records were for sites potentially within the NMP remit including 187 maritime records (wrecks) and 681 monument records, (Figure 33).

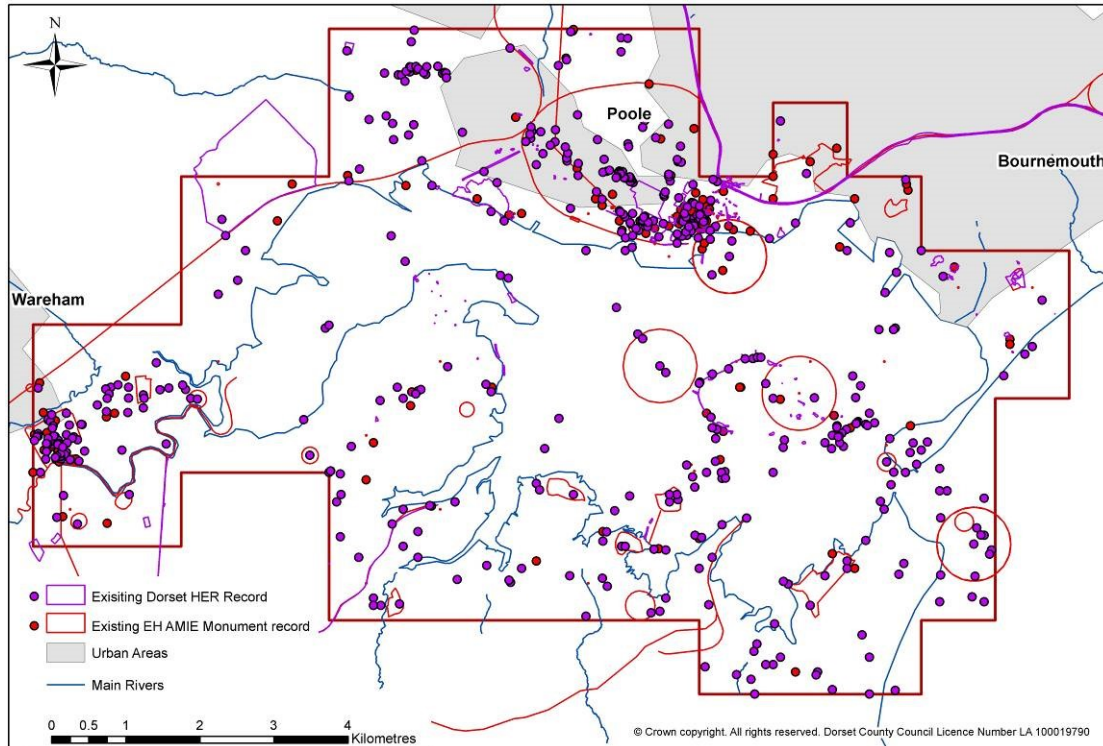


Figure 33. Block 4: Distribution of pre-existing AMIE records and Dorset HBSMR records (Monument (MON) and Maritime (MAR) records only).

Block 5. The large conglomeration of Bournemouth along with Christchurch and Highcliffe give Block 5 an almost exclusively urban character. Prior to the mapping, the AMIE database contained 188 records for this block. The Dorset HBSMR contained 501 records for the same area. These included 141 building records and 110 find spots. Two hundred and forty nine HBSMR records were for sites within the NMP remit including 36 maritime records (wrecks) and 213 monuments, (Figure 34).

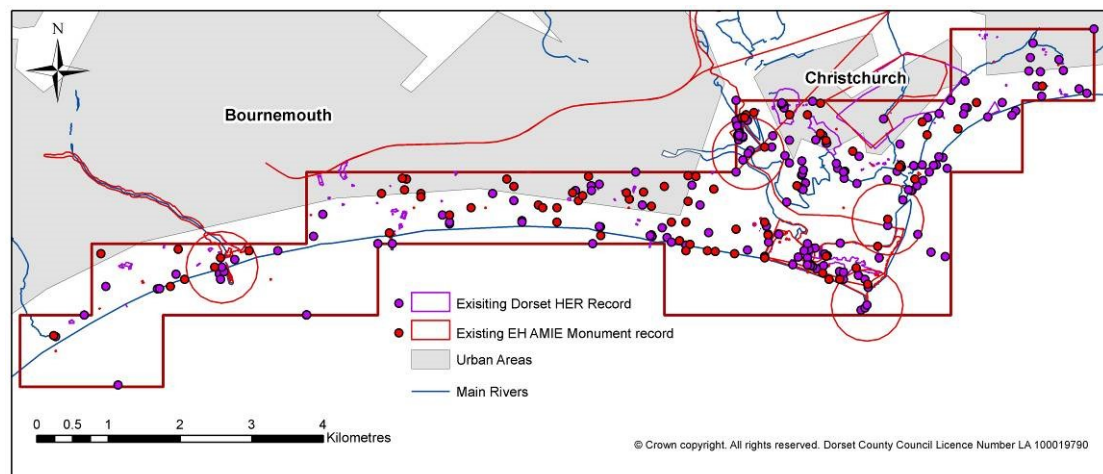


Figure 34. Block 5: Distribution of pre-existing AMIE records and Dorset HBSMR records (Monument (MON) and Maritime (MAR) records only).

6.2 Overview of the NMP mapping results

In general terms the nature of archaeological evidence available from aerial photographs determines the types of site recorded as part of NMP. Usually these are relatively substantial ditched or banked features either visible above ground as earthworks, or as cropmarks of sub-surface features. Historic photography also provides details of earthworks and structures which have been denuded or levelled by ploughing, or otherwise destroyed or removed in the last 80 years.

All sites mapped were recorded in the Dorset HBSMR database which automatically generated unique project record numbers prefixed MDO. Some sites previously existing within the database were prefixed MWX. All sites discussed in this report will be referenced using these MDO or MWX numbers.

For the purposes of this report, reference to 'new sites' refers to those not previously recorded in the Dorset HBSMR. It does not take into account sites recorded in other databases such as AMIE.

6.2.1 Numbers of sites in the project area

During the project 1734 monument records were input to the Dorset HBSMR database, these sites are shown in the distribution maps (Figures 35 to 39 below).

The maps show that in terms of overall distribution, sites were plotted right across the study area. On average the project recorded 6.6 sites per km². Block 1 was the least busy with 4.9 sites per km² and Block 5 the busiest with 8 sites per km². It should be noted that this statistic does not accurately reflect the extent of archaeological sites; in Block 3 for example, several extensive prehistoric and medieval field systems were plotted, each extending over many hectares but recorded as a single site.

In terms of new sites, of the 1734 monument records, 1308 were for new sites and 426 were for sites already recorded in the Dorset database.

The percentage of new sites across the project area as a whole was 75%. For each Block the percentages of new sites ranged from 60% of sites in Block 3 to 91% in Block 5.

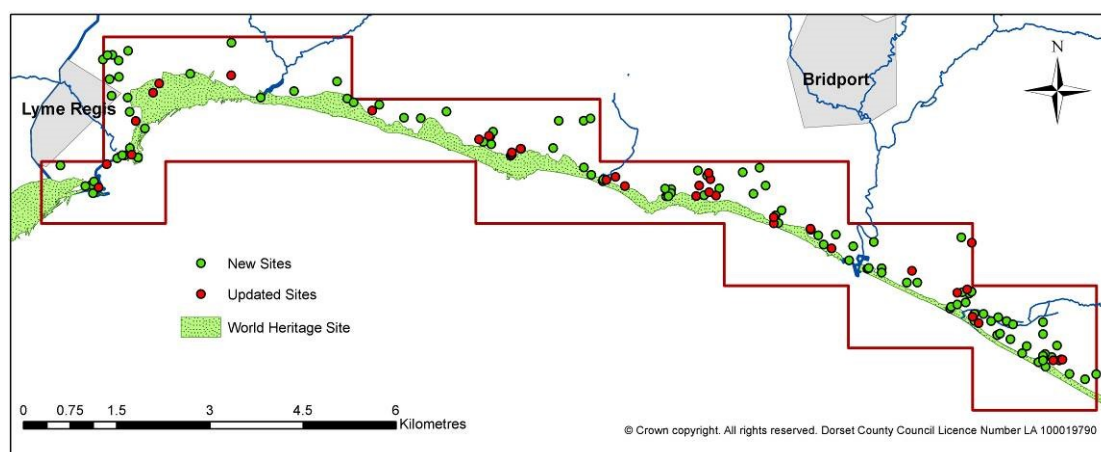


Figure 35. Distribution of all monuments mapped and recorded in Block 1

In Block 1, 146 monuments (74% of which were new sites to the Dorset HBSMR) were plotted and recorded; this amounted to an average density of 4.9 sites per km square.

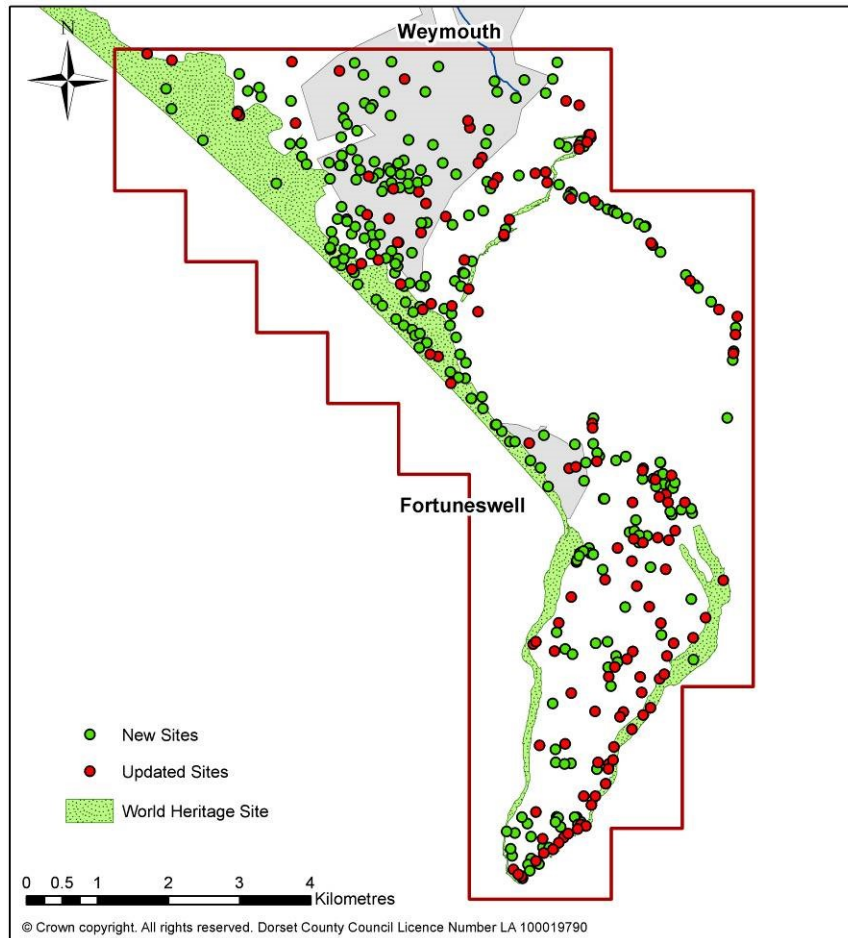


Figure 36. Distribution of all monuments mapped and recorded in Block 2

In Block 2, 403 monuments (74.4% of which were new sites to the Dorset HBSMR) were plotted and recorded; this amounted to an average density of 6.7 sites per km square.

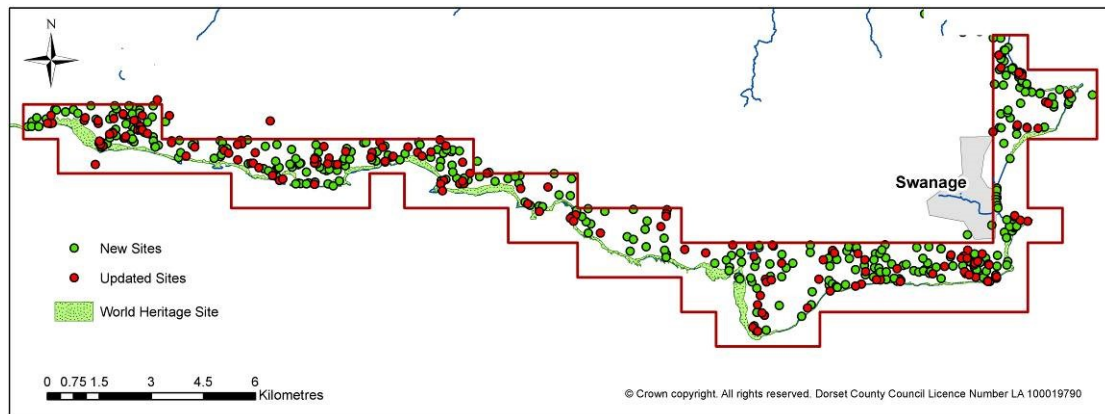


Figure 37. Distribution of all monuments mapped and recorded in Block 3

In Block 3, 525 monuments (59.7% of which were new sites to the Dorset HBSMR) were plotted and recorded; this amounted to 7.9 sites per km square.

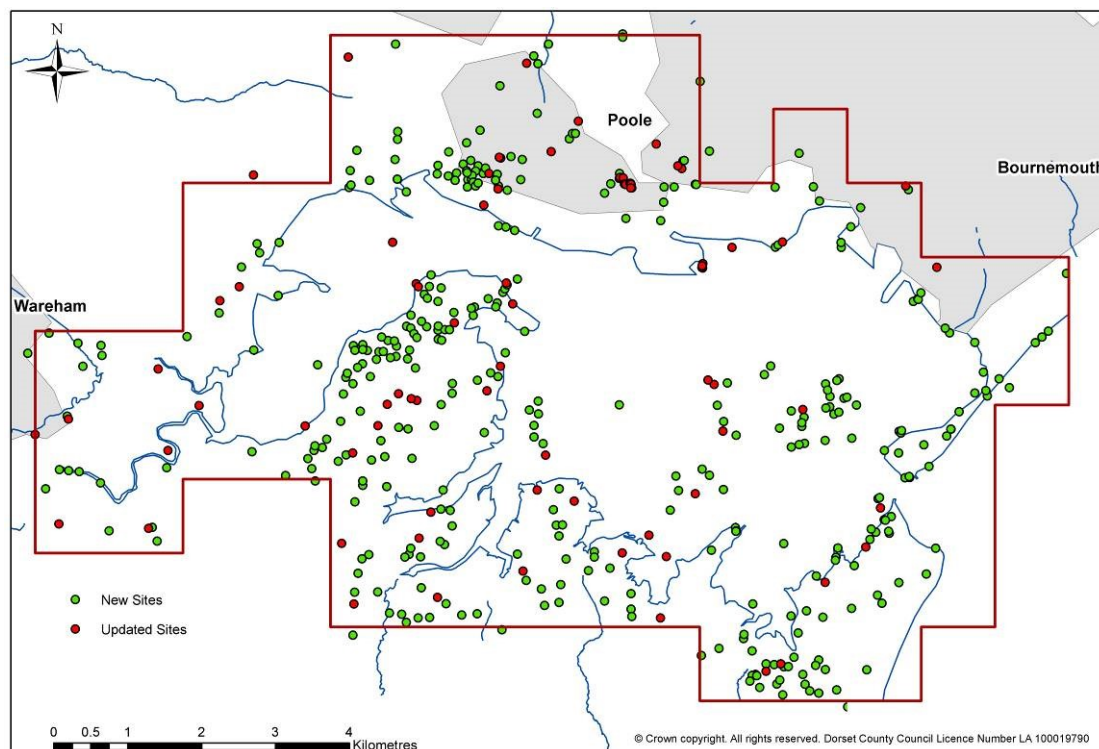


Figure 38. Distribution of all monuments mapped and recorded in Block 4

In Block 4, 460 monuments (82.9% of which were new sites to the Dorset HBSMR) were plotted and recorded; this amounted to 5.6 sites per km square.

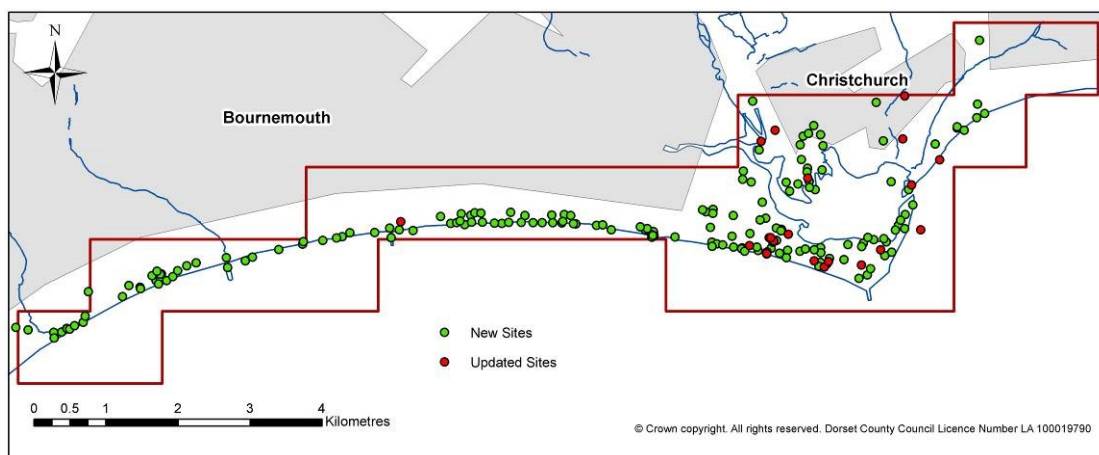


Figure 39. Distribution of all monuments mapped and recorded in Block 5

In Block 5, 200 monuments were plotted and recorded. This was the highest number both in terms of sites per km square (8) and numbers of new sites (91%).

The numbers of sites recorded by period are listed in Table 3 below.

The date ranges used in this report conform to national standards and are those used in the Dorset HBSMR project database. The project database requires start and end dates for all sites (or automatically assigns dates based on the given period).

It should be noted that the nature of aerial photographic evidence means that generally only broad ranges can be assigned to sites unless there is further corroborative evidence from field work, artefact scatters or excavation. Where possible, sites have been assigned dates based on form, context and excavated

precedents. Exact dates are not always possible. For the purposes of this report sites have been assigned as precise dates as possible based on the evidence. Some generalisations have been made; for example, ring ditches which were considered to be funerary related have been assigned to the Bronze Age despite their potential for being of late Neolithic/Early Bronze Age origin. Similarly prehistoric enclosures, settlements and field systems have generally been allocated a later prehistoric date (Iron Age/Romano British) although many may have their origins in the Bronze Age.

Period	Updated Sites	New Sites	Total
Bronze Age	53	17	70
Iron Age	4	0	4
Iron Age/Romano-British	7	12	19
Prehistoric/Roman	3	11	14
Early medieval	1	0	1
Medieval	31	23	54
Post medieval/early C20th	163	407	570
Historic	10	113	123
Modern	144	685	829
Undated	10	40	50
Total	426	1308	1734

Table 1. Numbers of sites recorded in the project database.

6.2.2 Form and survival of sites

The form and survival of each site was recorded in the project database. At the direction of the EHA, the form recorded was the last known form of the site (e.g. as visible on the latest Google Earth images or on the lidar) and not necessarily the form of the site on the photographs from which it was plotted. For example, if a site was visible as an earthwork on early RAF 1940s photographs but was later plough-levelled and consequently only visible as cropmarks on the latest photography, then the site was recorded in the database as a cropmark. Similarly, if a site was not visible at all (neither as earthworks nor cropmarks) on the latest imagery but had been plotted as an earthwork from early photographs, it would be recorded in the database as Levelled Earthwork (unless the site was obscured by vegetation [tree-cover or scrub] in which case it was recorded as earthwork). A summary of the form and survival of sites recorded is set out in Table 2 below.

Of the 1734 sites recorded during the mapping project 640 (37%) were still extant or partially extant earthworks and 244 (14%) were extant or partially extant structures. Eight hundred and fifty (49%) had been completely levelled or demolished. Of the total 1734 sites, only 106 (6%) were visible or partially visible as cropmarks on the aerial photographs.

Figures 40 to 44 show the distribution of sites by form across the five mapping blocks. Perhaps unsurprisingly, the highest numbers of sites still upstanding as earthworks were within the most rural areas (Block 1, Block 3 and the south-west side of Poole Harbour in Block 4). Whilst the average across the whole project area

was 37% of monuments surviving as earthworks; in Block 1, earthwork sites amounted to 86 sites (59%) and in Block 3 60% (314 sites).

Form	No: Sites	% or total
Cropmark	83	4.8
Cropmark and earthwork	13	0.8
Cropmark and levelled earthwork	10	0.6
Earthwork	596	34.4
Partially levelled earthwork	31	1.8
Levelled earthwork	408	23.5
Extant structure	211	12.2
Partially extant structure	33	1.9
Completely demolished structure	349	20.1
Total	1734	

Table 2. Form and survival of sites recorded in the project database.

Conversely, the highest numbers of levelled or demolished sites lay in the urban areas of Weymouth and the coastal strip from Poole eastwards. In Block 5, 169 (85%) of the 200 sites were cropmarks, levelled earthworks or demolished structures. Almost half of these (78 sites) were demolished beach defence structures dating to the Second World War.

The highest numbers of extant structures were found in Block 2 (Weymouth and Portland); 71 of the 403 monuments recorded in this area (18%) were structures, vessel structures and moved structures. Most of these were of military origin including forts, coastal batteries and torpedo stations, some dating back to the nineteenth century and First World War.

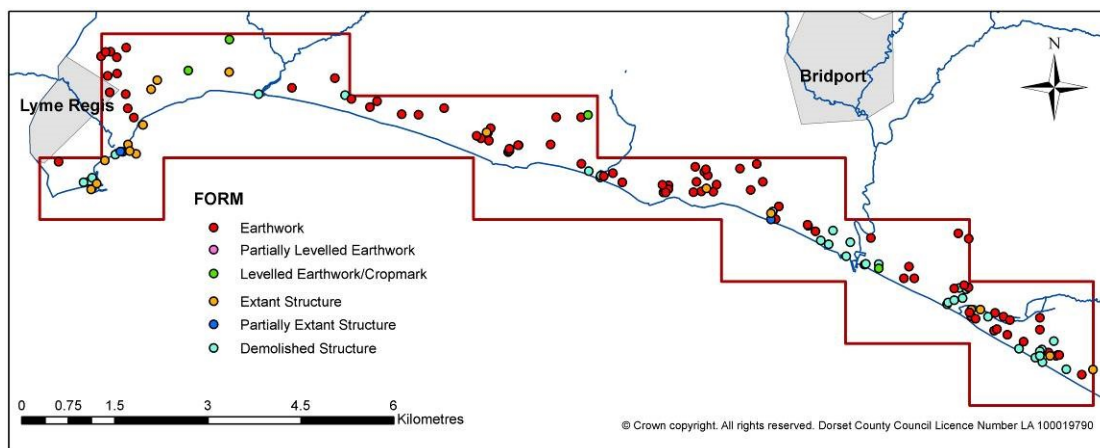


Figure 40. Form of all monuments mapped and recorded in Block 1

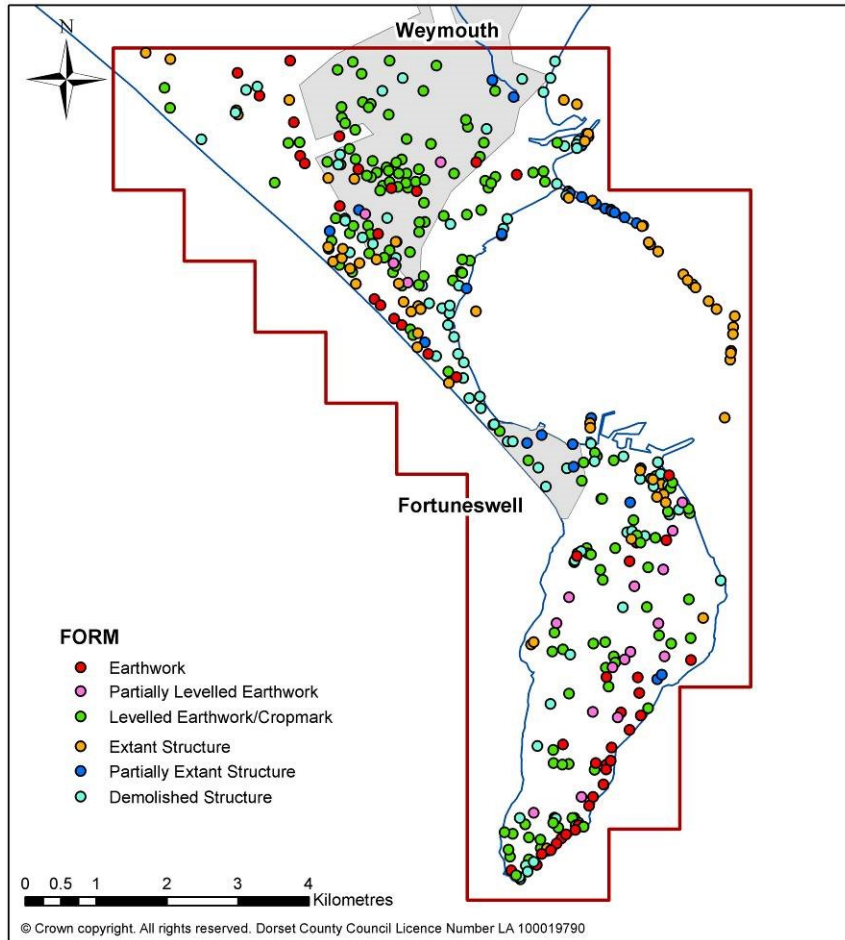


Figure 41. Form of all monuments mapped and recorded in Block 2

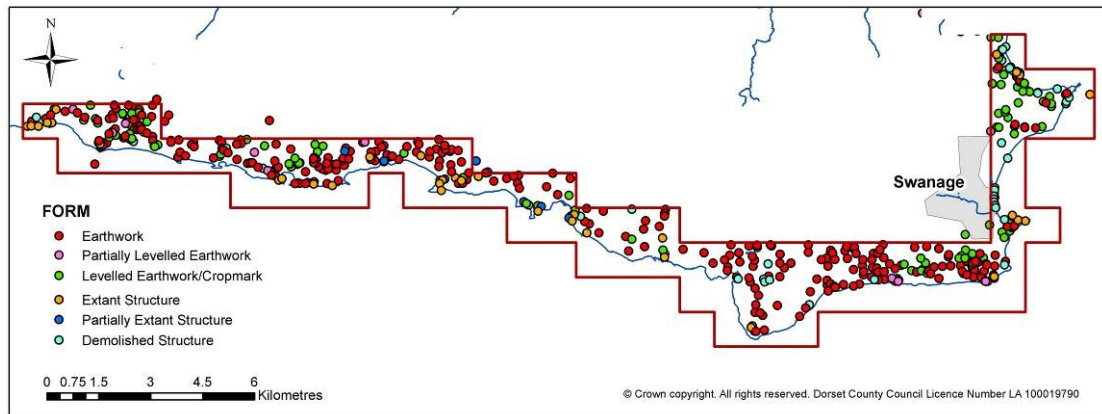


Figure 42. Form of all monuments mapped and recorded in Block 3

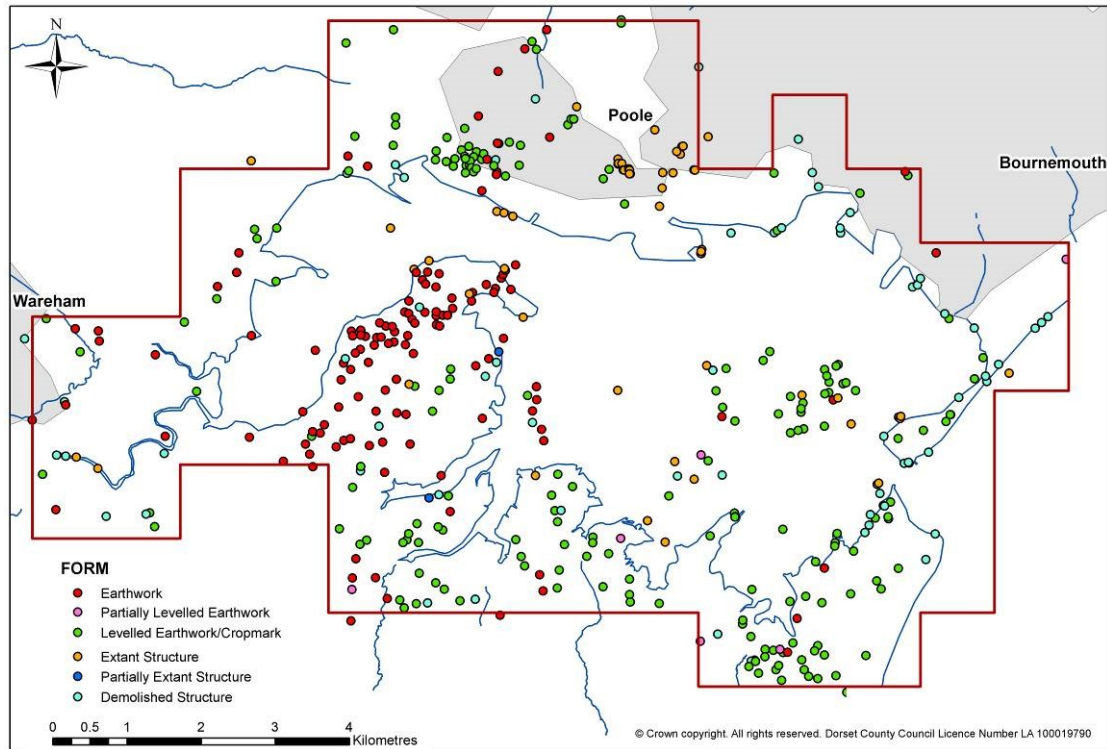


Figure 43. Form of all monuments mapped and recorded in Block 4

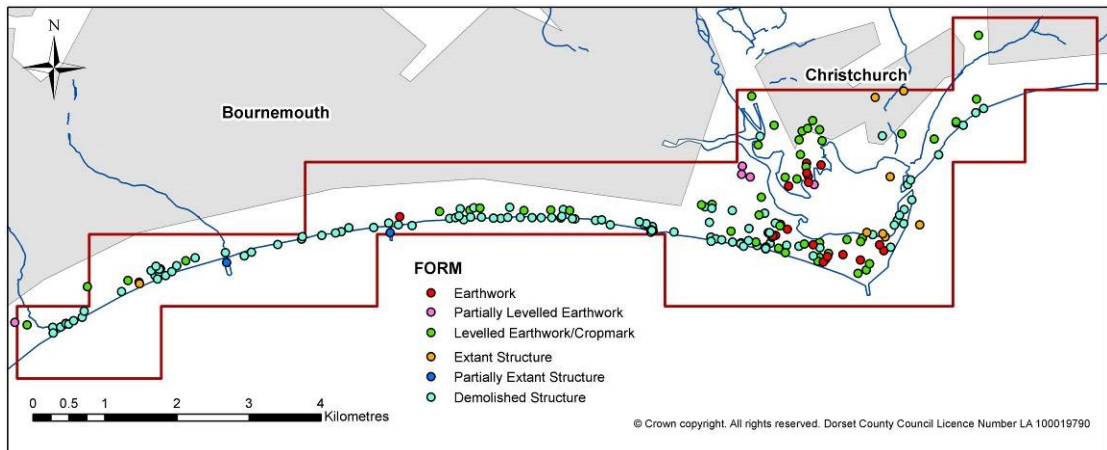


Figure 44. Form of all monuments mapped and recorded in Block 5

6.3 NMP results: Later Neolithic to Bronze Age sites (3,000BC – 800BC)

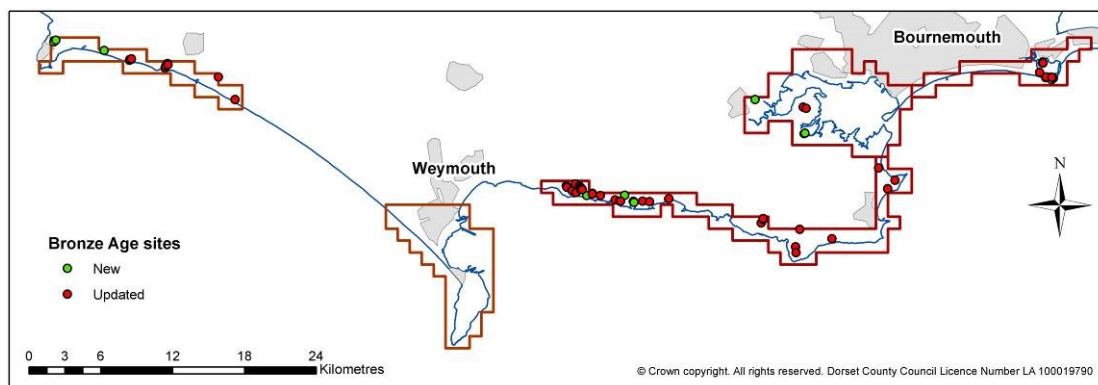


Figure 45. Distribution of Bronze Age sites.

During the mapping project, no sites were attributed to the Neolithic or earlier periods although two were given a late Neolithic or Early Bronze Age date.

Site Type	No: Sites
Bell Barrow	1
Bowl Barrow	33
Hengiform monument/penannular ring ditch	1
Pond Barrow	2
Ring Ditch	1
Round Barrow	32
Total	70

Table 3. Bronze Age Site Types

In all, 70 Bronze Age monuments were recorded, the majority of which (97%) were round barrows. Of these Bronze Age sites, 17 (24%) were new to the Dorset HBSMR. All but 13 sites were still surviving as upstanding earthworks.

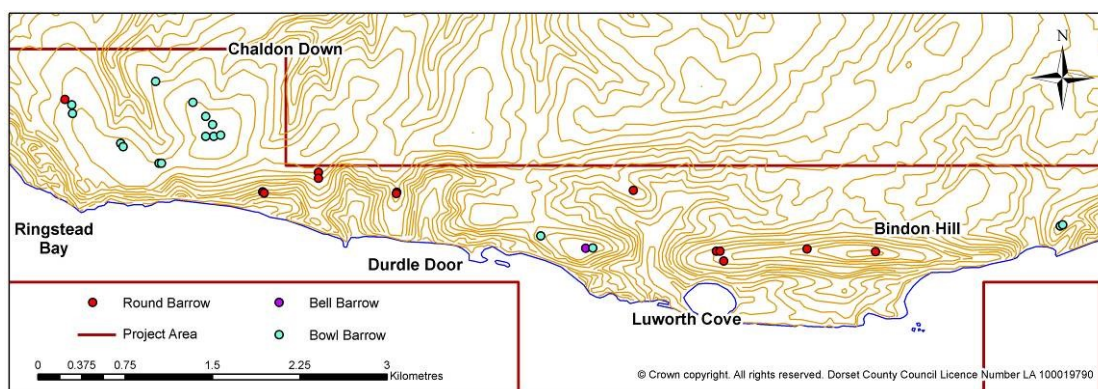


Figure 46. The distribution of Bronze Age barrows between Ringstead Bay and Bindon Hill, Block 3.

As the distribution map shows (Figure 46), the majority of Bronze Age sites recorded were located in Block 3, particularly towards the western end between Worbarrow Bay and Ringstead. Smaller groups of sites were located in Block 1 to the west of Lyme Regis and on Hengistbury Head, Bournemouth in Block 5. No sites dating to the Bronze Age were recorded in Block 2 (Weymouth and Portland).

The chalk escarpment ridge of the South Dorset Ridgeway meets the sea in Block 3, the concentration of barrows being located on the chalk grassland of the higher ground of the ridge. The largest group of barrows is located on the two adjacent hills between Chaldon Down and Ringstead Bay; here the chalk grassland is being put under the plough and of the 14 barrows six are visible as cropmarks (Figure 47)



Figure 47. Possible site of a ploughed out Bronze Age round barrow, Hambury Farm, West Lulworth.

MDO29373. Photograph: NMR 26097/10, 8th September 2008. © English Heritage.

These barrows perhaps form the eastern continuation of the long linear barrow cemetery recorded during the South Dorset Ridgeway Mapping Project (Royall 2011) which stretches for over 21km from White Horse Hill, Osmington in the east to Chilcombe Hill in the west. The tendency for barrows, over time, to be built together in large cemeteries has previously been noted (Cunliffe, 1993, 115) and the South Dorset Ridgeway is one of the most impressive although the consideration of this barrow concentration as a single entity lying along the Ridgeway with outlying groups (RCHME 1970) has been questioned and perhaps it is better considered as a number of smaller cemetery clusters (Woodward 1991).

Two sites of potentially late Neolithic or early Bronze Age date were mapped during the project, both of which were new to the record. These are a pair of ring ditches to the south east of Middlebere Farm, Arne in Block 4, on the south-west side of Poole Harbour.

The first (MDO28974) is a small circular enclosure considered to be a possible hengiform monument. These are typically 5-20m across with a roughly circular area enclosed by a ditch with outer bank (EH 1989). The Arne site has a central area 5.8m across enclosed by an outer ditch and bank. The enclosing bank is 20m across with a gap located towards the northern side of the enclosure which may be the site of an entrance. The bank appears to be further enclosed by an outer ditch which is unusual for hengiform monuments so an alternative interpretation (such as a small late Neolithic penannular ring-ditch covered by a round barrow) cannot be ruled out (Figure 48).

The second site (MDO28975) lies 68m to the south west of the first and comprises a ring ditch 17m across. It is visible as cropmarks on Google Earth imagery and was given a potentially late Neolithic to Bronze Age date on the strength of its proximity to the potential hengiform monument.



Figure 48. Possible hengiform monument, Middlebere Farm, Arne.

MDO28974. Photograph: RAF 540/769 Frame 5022 12th June 1952 English Heritage RAF photography

6.4 NMP results: Iron Age (800BC – 43AD)

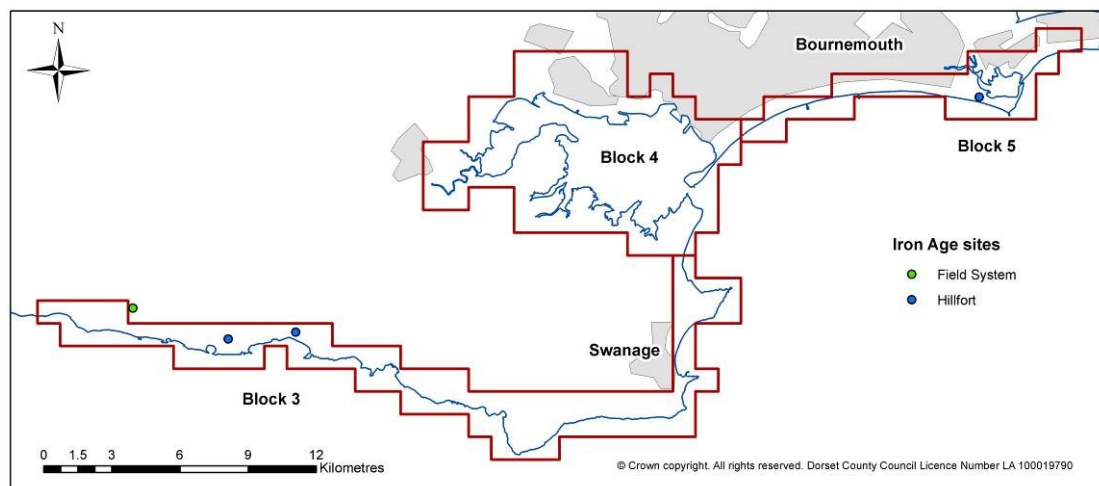


Figure 49. Distribution of Iron Age sites

Four sites of a specifically Iron Age date were mapped during the project, all of which had previously been recorded in the Dorset HBSMR. All were surviving as upstanding earthworks or structures. A further 15 sites were attributed to the Iron Age or Roman period and are described in Section 6.5 below.

Site Type	No: Sites
Dyke (defence)/Hillfort	1
Enclosed Field System/Field System	1
Hillfort/Promontory Fort	2
Total	4

Table 4. Iron Age Site Types

6.4.1 Hillforts and hilltop enclosures



Figure 50. Flowers Barrow Hillfort and associated cross dyke on Rings Hill, East Lulworth.

MDO7654. © Cornwall Council 2013 based on Channel Coast Observatory data 2008.

Hillforts are defended enclosures surrounded by one or more earthen ditched and banked ramparts. They are generally placed on hilltops, ridges and promontories although some are located in much more low-lying positions (EH 2011a). Whilst some may have had their origins in the late Bronze Age, hillforts were generally built and occupied in the Iron Age. Three hillforts lie within the project area, two in Block 3 on the chalk escarpment ridge.

Flowers Barrow hillfort (MDO7654) is perched on the cliff edge at Rings Hill on the western edge of the Purbeck Hills. It is generally considered to be a univallate hillfort to which a second set of ramparts was later added extending the hillfort east and west. A large portion of the hillfort has been destroyed as a result of coastal erosion (Figure 50).

Less than 1.5 km to the west of Flowers Barrow is a larger Iron Age defensive enclosure complex on Bindon Hill (MDO8257). The main feature of the complex is a long linear dyke running east-west for over 2,300m on the northern side of the ridge before turning south towards the coast at Lulworth Cove. The earthwork effectively encloses 107ha of coastal ground between Lulworth Cove and Cockpit Head; although this has probably been much reduced by coastal erosion since the dyke was first constructed. North-south cross dykes were constructed at the western end of the defensive dyke which have previously been interpreted as an unfinished hillfort (Figure 51).



Figure 51. Iron Age defensive dyke and possible unfinished hillfort at the western end of Bindon Hill, Lulworth.

MDO 8257. Photograph: RAF CPE/UK1821 Frame 5434 4th November 1946. English Heritage RAF photography

The third Iron Age defensive earthwork is situated on Hengistbury Head, the peninsula forming the southern side of Chichester Harbour (MDO8633). The site is known as Double Dykes (MDO8633) and comprises two linear ramparts, 718m apart, cutting off the headland to form a promontory fort. Although two excavations have been carried out on the site no firm dating evidence has been recovered (Cunliffe 1987).

6.4.2 Field systems

The dates of origin of prehistoric field systems can be varied and their use spans many millennia. Many probably had an origin in the Middle Bronze Age with later adaptations into the Roman period (EH 2011b). They are further discussed in Section 6.5.1 of this report. One field system visible on the aerial photographs and lidar was recorded in the HBSMR with a specifically Iron Age date (MDO7285). This was a field system at Chideock Farm on Chilton Down (Figure 52).

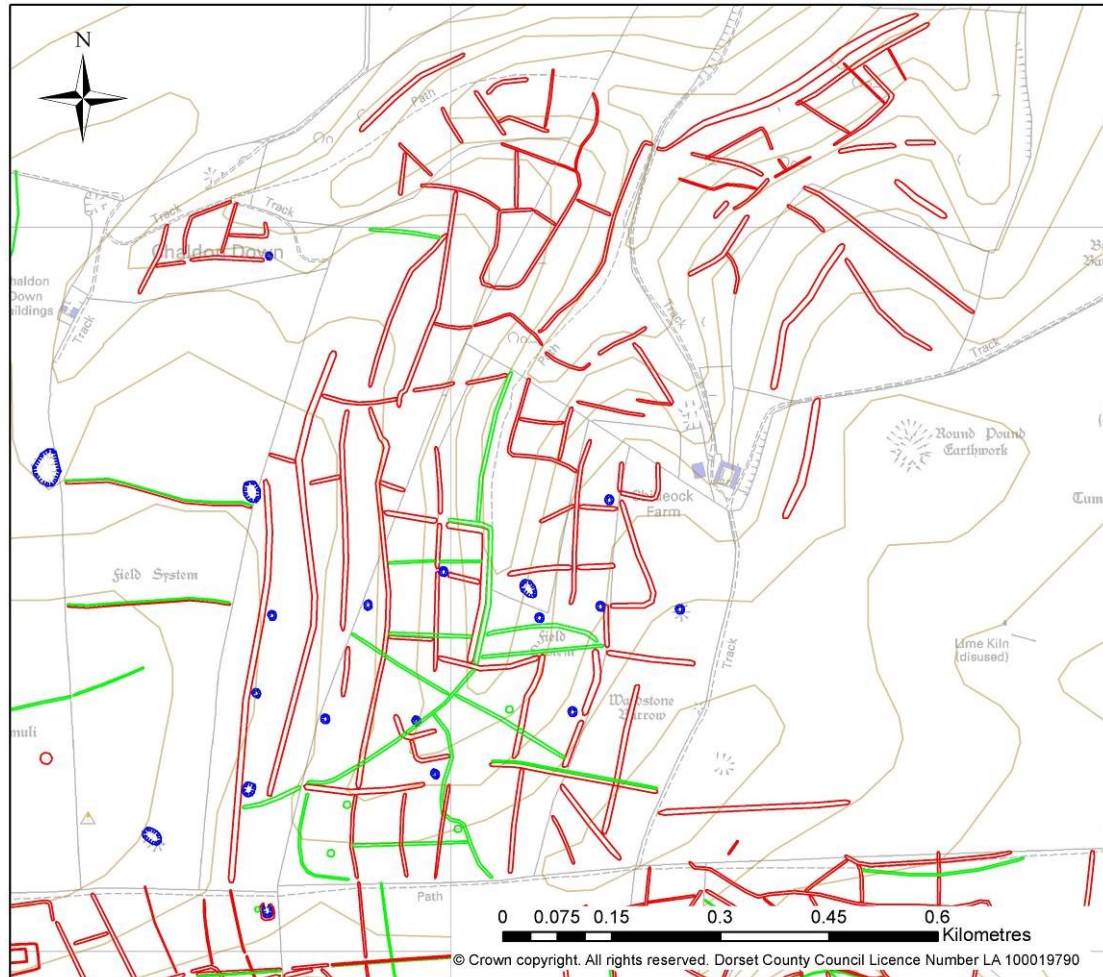


Figure 52. Possible Iron Age field system on Chilton Down, Chaldon Herring.
NMP mapping © English Heritage.

6.5 NMP results: Roman or Iron Age/Romano British sites (800BC – AD409)

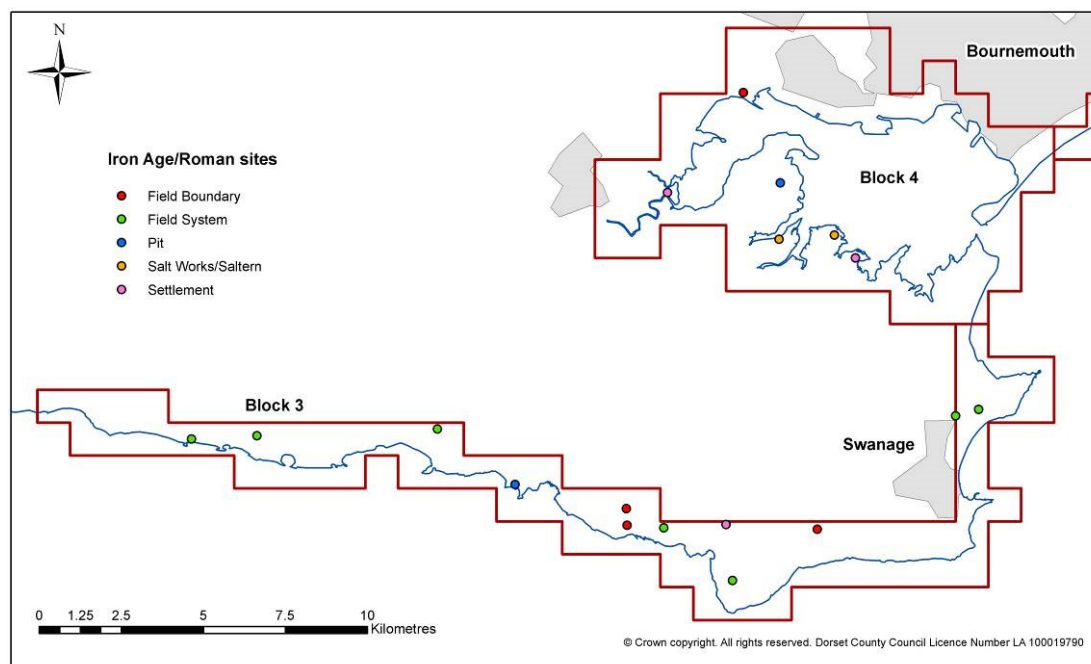


Figure 53. Distribution of Roman or Iron Age/Romano British Sites

Four sites were mapped during the project and allocated a specifically Roman date; in addition a further 15 were attributed more generally to the late Iron Age or Roman periods. Of these 19 sites, 12 (63%) were new to the county HBSMR. As Figure 53 above shows, all the sites lie within Block 3 and 4. Thirteen sites were still visible as extant or partially extant earthworks; these included field systems, field boundaries and a settlement.

Site Type	No: Sites
Field Boundary	4
Field System	7
Pit	3
Saltern	2
Settlement	3
Total	19

Table 5. Roman Site Types

6.5.1 Field systems and field boundaries

Seven Iron Age or Roman field systems were plotted during the mapping project as well as four areas of fragmented field boundary. All were visible as earthworks or partial earthworks on the latest aerial photographs or lidar. In adjacent Hampshire, evidence dating the origins of the 'Celtic fields' to the Bronze Age comes from the Danebury survey (Palmer 1984, 70; Cunliffe and Poole 2000) however, it seems probable that they had later adaptations during the Iron Age and into the Roman period (EH 2011b).

The most extensive field system lies on the coastal chalk downland of The Warren, West Lulworth (MDO8266). The system is clearly visible as an extant series of lynchets on lidar (see Figure 29). It lies immediately to the south of the Iron Age field system described in section 6.4.2 above and is probably a continuation of the same system, (Figure 54).

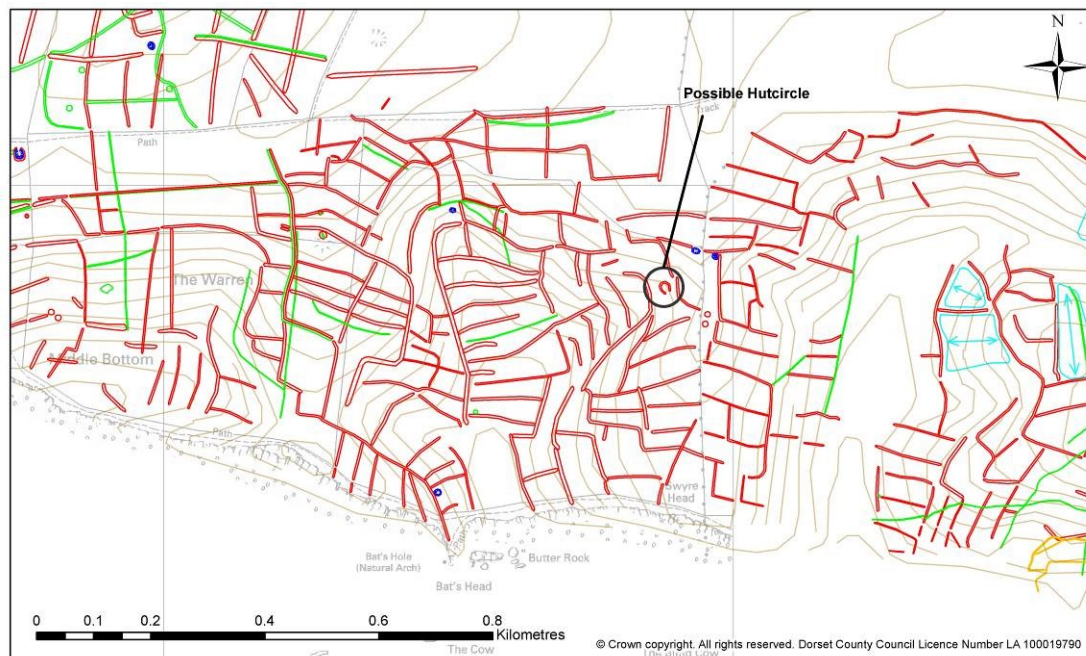


Figure 54. Iron Age/Romano British 'Celtic' field system at The Warren, West Lulworth.

NMP mapping © English Heritage.

Smaller fragments of field system were also recorded on Studland Head (MWX847) and on St Aldhelm's Head (MWX616). The system on St Aldhelm's Head, Worth Matravers incorporates a complex of small paddock enclosures which are likely to be the site of a contemporary settlement (Figure 24).

6.5.2 Settlements

Three sites were recorded as Iron Age or Roman settlements.

At Swineham, Wareham St Martin (MDO8142) linear ditches and enclosures were visible as cropmarks on aerial photographs taken by the RAF in the 1970s. The features coincide with the site of a substantial Roman industrial settlement which was identified from scatters of occupation debris in the surrounding fields. Test pitting and geophysical survey carried out in 1989 confirmed that the settlement which is spread over 2 hectares was inhabited from the Late Iron Age into the fourth century AD (Smith and Barnes 1990).

A second industrial occupation site lies on the Ower Peninsula, Corfe Castle (MDO7461). Here excavations, geophysical survey and field walking carried out in the 1970s and 80s identified an extensive late Iron Age settlement which was later reoccupied from the second century AD through to the sixth to seventh centuries AD (Cox and Hearne 1991). The Roman occupation included a number of industrial activities including salt working, pottery production, metalworking and shale working. A complex of rectilinear bank and ditched enclosures with associated trackways and field boundaries were visible as cropmarks on aerial photographs taken in 2008. These were considered to be associated with the Iron Age/Roman settlement and industrial complex (Figure 55).



Figure 55. Late Iron Age and Roman settlement features at Ower, Corfe Castle.

MDO7461. Photograph: NMR 15402/07, 31st July 1996. © English Heritage. NMP mapping © English Heritage.

The third settlement lies on Kingston Down, Corfe Castle. Here an extensive field system covering an area of 37 hectares lies on the coastal plateau above Houns-tout Cliff (MDO7451). Two settlements are incorporated into the coherent system of Celtic fields, the south-eastern settlement lying within the mapping project area on the very edge of the plateau overlooking the confluence of three stream valleys. Later Iron Age and Romano-British pottery sherds have been recovered from the vicinity of the settlement which is clearly visible as earthwork on lidar (Figure 56) and protected by statutory scheduling (DO158).

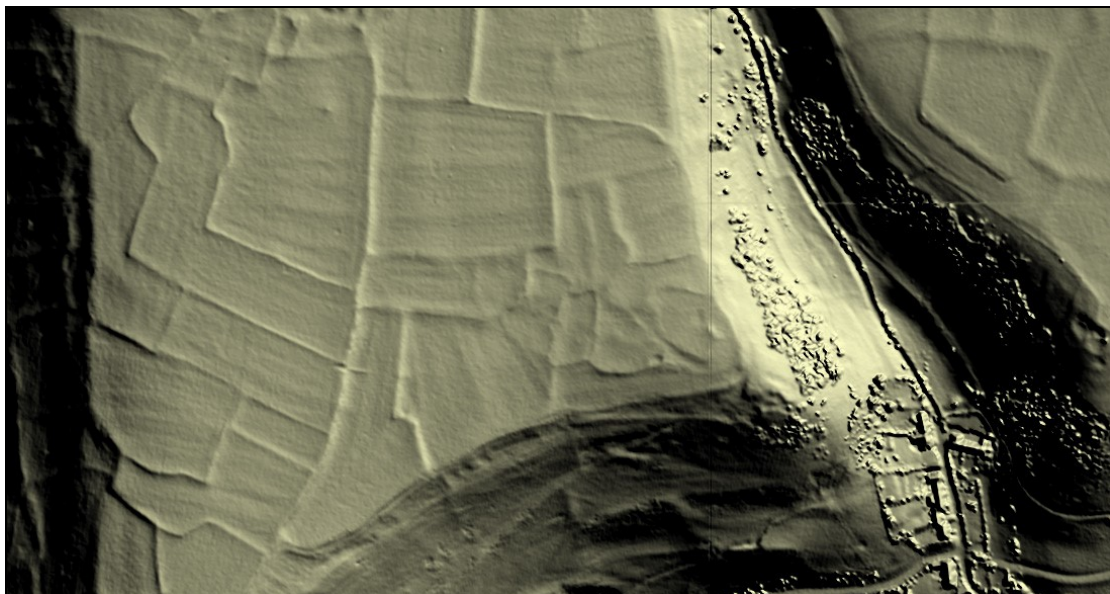


Figure 56. Kingston Down late Iron Age/Romano British settlement, Corfe Castle.

MDO7451 © Cornwall Council 2013 based on Channel Coast Observatory data 2008.

6.5.3 Salt working sites

Salt has been an important commodity since the earliest of times being one of the principal ways of preserving food. In addition it is an essential ingredient in bread, butter and cheese and a principal component in tanning and cloth dying. Whilst salt production in Britain dates back to the Bronze Age, it developed through the Iron Age and Roman periods and its methods remained largely unchanged into the eighteenth and nineteenth centuries (EH 2011c). Salt production involved the evaporation of seawater to form sodium chloride crystals. This was achieved by funnelling sea water into evaporation pans in order to concentrate the brine before boiling the brine in metal or ceramic vessels. Over time, an accumulation of broken pottery vessels inevitably occurred and the identification of these pottery sherds (known as briquetage) through field walking or excavation is one of the key indicators of the presence of a salt-production site.

Salt working has been identified by excavation and field work at two of the settlement sites described above (MDO7461 and MDO8142). A third site with evidence of Iron Age and Roman occupation and salt working has been previously identified at the north end of the low-lying Fitzworth peninsula, Corfe Castle (MDO7459). Pits and banked features were visible as cropmarks on aerial photographs in this vicinity and considered to be associated with this salt working site.

A potential fourth site was identified at Middlebere Lake, Arne, adjacent to the site of a briquetage scatter noted in 1987 (Wilmott 1997). A curvilinear enclosure was identified as cropmarks on aerial photographs on the edge of Middlebere Lake and considered possibly to be an evaporation pan or saltern, contemporary with the adjacent scatter (MDO28981).

6.6 Prehistoric or Roman sites (4000BC –AD410)

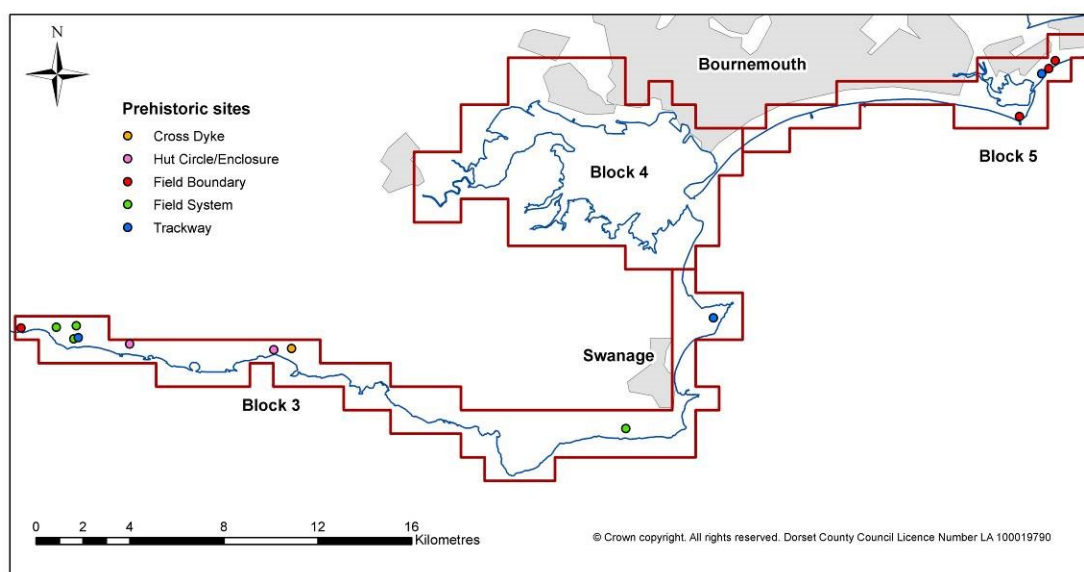


Figure 57. Distribution of prehistoric or Roman sites.

It was not possible to attribute a specific period to 14 sites considered to be of Roman or earlier date; of these, 11 (79%) were new to the record. Six sites are still extant or partially extant as earthworks. For the purposes of this report, these sites are referred to as ‘Prehistoric’ in the following section even though some sites may have been in use into the Roman period.

They included generic monument types not attributable to a specific period such as field systems, trackways and enclosures.

Site Type	No: Sites
Cross Dyke	1
Field Boundary	4
Field System/Enclosed Field System	4
Hut Circle	1
Ring Ditch	1
Trackway	3
Total	14

Table 6. Prehistoric Site Types

6.6.1 Field boundaries, field systems and trackways

Eight field systems and field boundaries and three trackways of later prehistoric origin were recorded during the project. These included three groups of field boundary towards the east end of the project area in Block 5; one in the vicinity of Hengistbury Head (MDO28804) and two others at Friars Cliff, Christchurch (MDO28800 and MDO28801).

Three sites were recorded as prehistoric field systems in the west of Block 3 on the cliffs above White Nothe. These are located in close proximity to (and therefore considered likely to be extensions of) the extensive Iron Age/Romano British field systems on The Warren (MDO8266) and Chilton Down (MDO7285) described in the

previous sections. These field systems were much fragmented and visible as cropmarks or low earthwork lynchets (Figure 58).

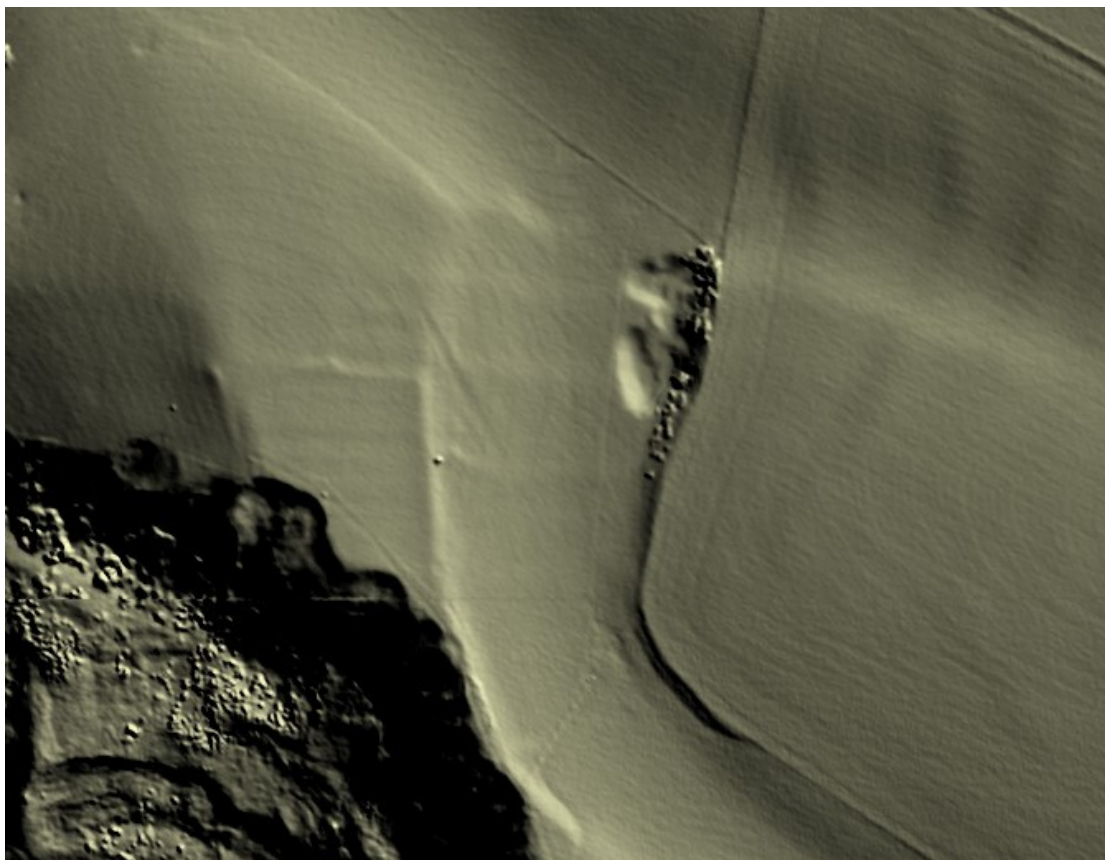


Figure 58. Low earthwork lynchets of a prehistoric field system at Ringstead Bay, Owermoigne. MDO1878 © Cornwall Council 2013 based on Channel Coast Observatory data 2008.

6.6.2 Settlement

Very little evidence for prehistoric settlement was identified during the project. One small curvilinear enclosure was mapped within the extensive field system on The Warren. This is possibly the remains of an unenclosed roundhouse settlement or farmstead and if so, is likely to be a contemporary with the field system, (MDO29359) (Figure 53).

A second curvilinear enclosure or ring ditch was identified as cropmarks lying 100m to the west of Flower's Barrow hillfort. The ring ditch is 15m across with a possible gap or entrance on its south side. Its close proximity to the hillfort has led the interpreter to suggest a later prehistoric date for the feature which may be a hut circle or enclosed settlement; however the possibility that the feature is of natural origin cannot be ruled out (MDO29424).

6.6.3 Cross ridge dyke

A late prehistoric cross ridge dyke is located 150m to the east of Flower's Barrow hillfort running roughly north-south across the pronounced ridge of Rings Hill. (MDO7655). The feature, which is scheduled, has previously been considered to be an outwork to the main hillfort however as Figure 59 shows, the cross-dyke earthworks are significantly slighter than the main ramparts. The possibility that the cross-dyke predates the main hillfort cannot be ruled out.

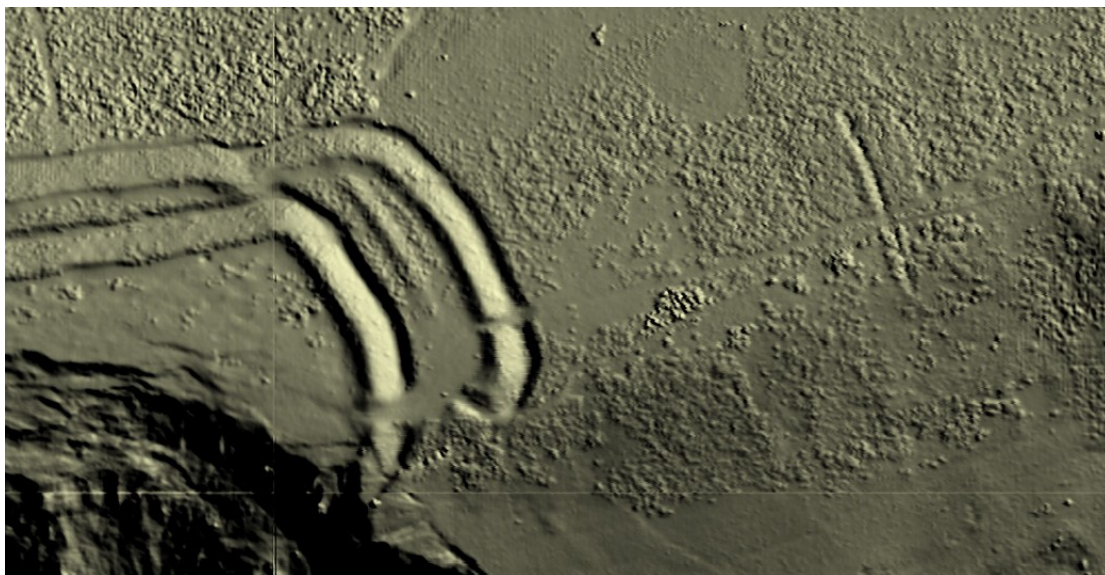


Figure 59. A late prehistoric cross ridge dyke to the east of Flower's Barrow Iron Age hillfort.
MDO7655 © Cornwall Council 2013 based on Channel Coast Observatory data 2009.

6.7 NMP results: Early Medieval sites (AD410 – AD1066)

Like neighbouring Hampshire and Southern England generally, physical evidence for early medieval activity in Dorset is sparse. One site was plotted during the NMP project and identified as dating to the early medieval or Anglo Saxon period. This was the earthwork defences of the Anglo Saxon burgh of Wareham (MWX698).

The defences of the town are first mentioned in 876 in an account of the war between King Alfred of Wessex and the Danes. After the Danes withdrawal from the town and finally to Mercia, Alfred created a network of burghs or fortresses defending the frontiers of Wessex. Wareham was fortified with an earthen bank and stockade on its west, north and east side; whilst the south side of the town marked by the River Frome was left unprotected. The town is listed in the Burghal Hidage of Edward the Elder drawn up in the early 10th century (Robertson 1939 and Yorke 1995).



The surviving earthwork defences of the early medieval burgh are clearly visible on aerial photographs (Figures 59-60). They were repurposed and refortified in the Second World War with the addition of gun emplacements, barbed wire entanglements and anti-tank cubes obstruction the vulnerable entrances to the town (MDO28785).

Figure 60. The early medieval defences and street plan of the Saxon burgh of Wareham are visible this 1945 aerial photograph.

MWX698. Photograph: RAF 106G/LA194 Frame 940, 14-MAR-1945 English Heritage RAF photography.

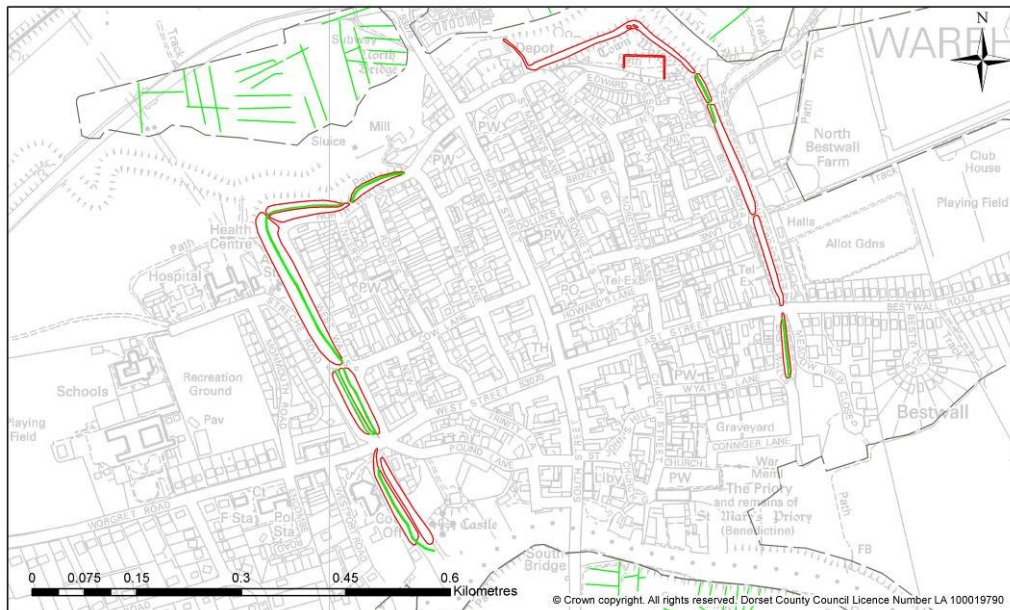


Figure 61. The early medieval defences of Wareham. NMP mapping © English Heritage.

6.8 NMP results: Medieval sites (AD1066 – AD1540)

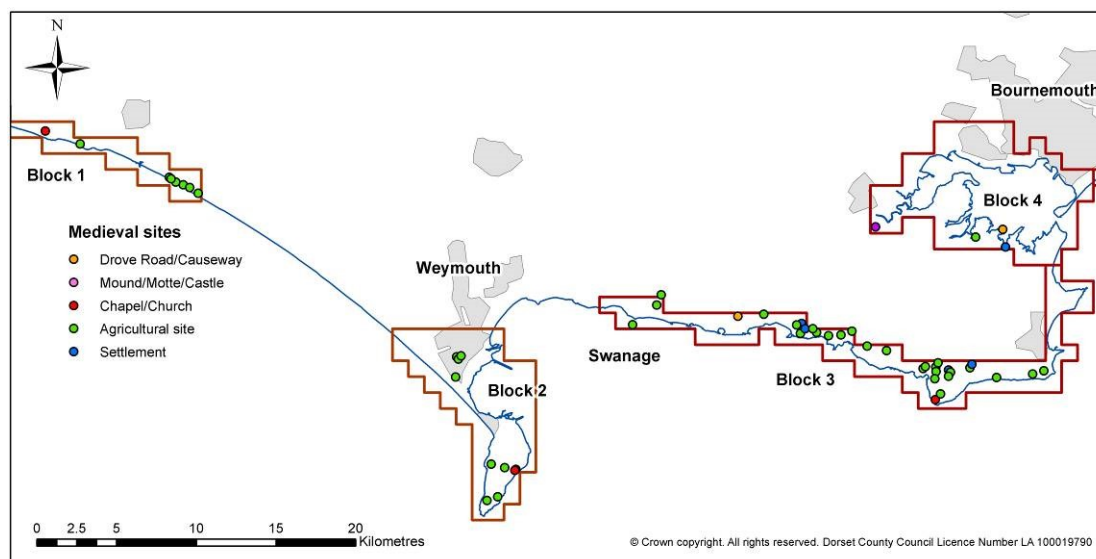


Figure 62. Distribution of Medieval sites

Sites dating to the later medieval period are more richly represented than the early medieval period with 54 monuments identified during the project; of these, 23 (43%) were new to the Dorset HBSMR. The majority of sites (44 (81%)) were still visible as upstanding earthworks or structures. As the distribution map above shows, a high proportion of the medieval sites were in Block 3; the eastern end of Block 1 also had a high concentration of monuments dating to this period. Block 2 and the southern portion of Block 4 had a small number of medieval sites whereas none were recorded in Block 5.

Site Type	No: Sites
Castle	1
Causeway	1
Chapel/Church	3
Cultivation Terrace	1
Deserted Settlement	2
Drove Road	1
Field Boundary	6
Field System	12
Mound/motte	1
Ridge and Furrow	5
Shrunken Settlement	2
Strip Field	3
Strip Lynchet	15
Town	1
Total	54

Table 7. Medieval Site Types

The new sites were without exception related to agricultural activity and included 12 field boundaries and field systems, five areas of ridge and furrow and six strip fields and strip lynchets.

It must be noted that many more potentially medieval sites were encountered during the mapping project. However as some of these may have had earlier prehistoric origins or continued in use into the post medieval period they were given more general date ranges and are described in Sections 6.10 (Historic) and 6.12 (Undated).

6.8.1 Settlements

From the fourteenth century onwards, a decline in the rural population caused the shrinkage and desertion of a large number of medieval villages and hamlets in England. This population decline has traditionally been blamed on the Black Death of 1348-9 which may have reduced the population by as much as 50% (Hare 1994). However the reasons for abandonment are far more complex: soil exhaustion, a change from an arable farming to a pastoral regime and, at the end of the medieval period, the movement of a large portion of the rural population into towns also contributed to abandonment of many rural settlements. The development and contraction of settlements is a complex response to changes in social, economic or climatic conditions, each settlement being unique in its reaction to those changes. No one factor can therefore be attributed as the cause of widespread settlement abandonment (EH 2011d).

Earthworks associated with four deserted or shrunken medieval settlements were recorded. These included the adjacent settlements of Baltington (MDO8052) and Tyneham (MDO8054) in the parish of Tyneham. Settlements were also recorded at Weston Farm, Tyneham (MDO8369) and at Eastington Farm (MDO8371) in the parish of Worth Matravers. A fifth abandoned settlement lies at Gotowre super Mare, Studland (MDO7937).

Baltington is referred to in the 1280 Assize Rolls as Boltington/Bullington (Mills 1977), it is one of twin deserted medieval settlements located 400m apart at Baltington and Tyneham Farm, Tyneham. The settlement earthworks each cover 4 to 5ha and are associated with extensive ridge and furrow field systems (Figure 63).



Figure 63. Adjacent deserted medieval settlements at Baltington and Tyneham Farm, Tyneham.

MDO8052, MDO8054. Photograph: RAF 106G/LA105 Frame 2028, 21-JAN-1945 English Heritage RAF photography. NMP mapping © English Heritage.

The existence of the site of a medieval new town and borough ('Nova Villa'), somewhere at the head of Newton Bay, has long been suggested through documentary evidence. In 1286 Richard de Bosco and Walter de Marisco were appointed by Edward I to lay out a new town with a harbour in 'gotowre super Mare', Studland. In the same year the burgesses of 'Nova Ville' were granted weekly markets and yearly fairs (Le Pard and Bellamy 2011).

The area immediately adjacent to Newtown Farm has been considered the most likely location for this failed settlement. A series of rectilinear enclosures and trackways has been identified from aerial photographs taken in 1982 to the east of Newton Heath between Newton and Games Copse on low-lying ground, 150m to the south west of the modern high-tide line at the southern tip of Newtown Bay. The low earthworks and cropmarks, which cover an area of over 4 hectares, appear to form a coherent series of building platforms aligned along a north-west south-east orientated roadway (Figure 64).

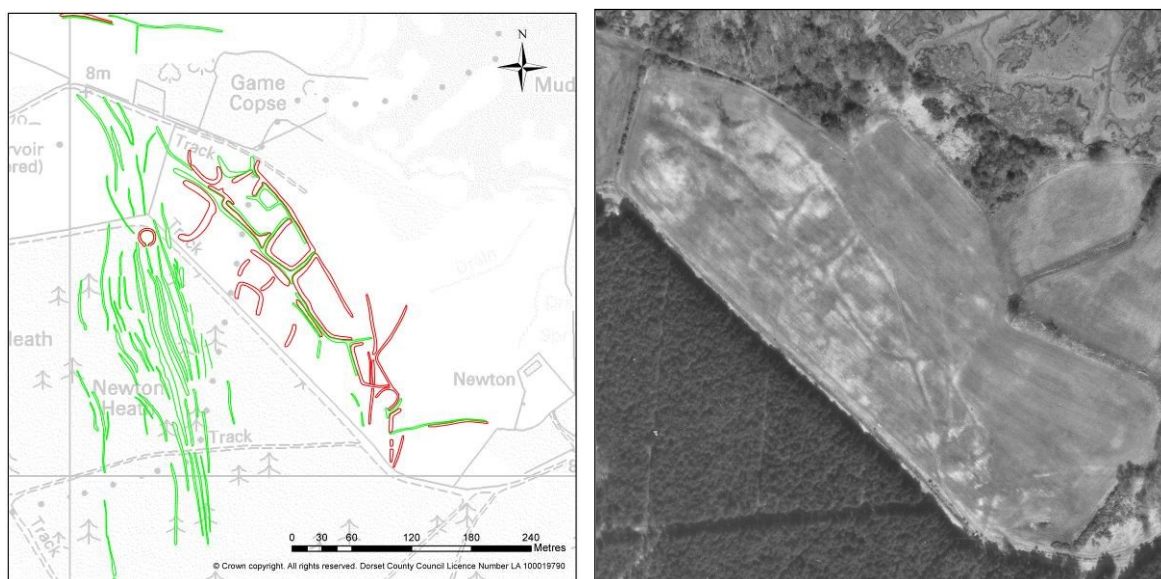


Figure 64. Probable site of 'Nova Villa' failed medieval settlement, Newtown, Studland.

MDO7937. Photograph: OS/82032 Frame 240, 16-APR-1982 © Crown copyright. Ordnance Survey. NMP mapping © English Heritage.

6.8.2 Agricultural features

Forty two sites associated with medieval agriculture were plotted during the project. These included 12 field systems, six field boundaries, three strip fields and 15 strip lynchets. In addition, five areas of ridge and furrow cultivation strips were identified. Of these sites, 23 (55%) were new to the Dorset HBSMR.

It has been previously noted that parts of South Dorset were extensively cultivated in the Middle Ages (Royall 2011) and whilst the numbers of sites dating to this period is relatively low, there is some evidence for the reuse of older prehistoric field systems into the medieval period. At South Egliston, Tyneham (MWX4704), medieval parallel strip lynchets were visible as earthworks overlying earlier Celtic fields and at Kingston Down, Corfe Castle, low parallel ridging is visible on the lidar within the Celtic-type field system (Figure 56) which may be later medieval cultivation ridges.

Field systems and strip fields. During the medieval period in much of England, arable cultivation took place using the open field system (Hare 1994). Large open fields associated with each village were split into sections or furlongs and then further subdivided into smaller strips. Each year, villagers would have been apportioned a number of strips for their own subsistence farming within the larger open field. From

the twelfth century onwards, these smaller strips were gradually enclosed by field boundaries giving rise to the typically long narrow strip fields attributed to this period.



The best preserved medieval open strip fields lie on Portland (MDO6521 and MDO6526) which was a royal manor in 1086 and divided into five tithings. The fields were under communal management into the nineteenth century and although parts of the open field system have since been destroyed by quarrying, ploughing and modern development, many of the medieval furlongs are still preserved in places (Figure 65). The field systems are known locally as Lawnsheds.

Figure 65. Medieval open fields on Portland

MDO6521 and MDO6526. Photograph: RAF 106G/UK/1411 Frame 4051. 13-APR-1946 English Heritage RAF photography.

Lynchets and strip lynchets. Many steeper slopes were cultivated as a response to increasing demand resulting from population growth in the later medieval period. The construction of extensive contour strip lynchets lining the valley sides of the dry coombes on the chalk downs occurred throughout much of southern Britain during this period as people were forced by population pressure to cultivate marginal areas and steep hillsides (Hare 1994).

An extensive system of medieval contour strip lynchets is located on the steep valley sides to the south of Worth Matravers. The system lines the valley running southward to Winspit and is best preserved on the two prominent spurs of East and West Mann. Traces of strip lynchets also lie on the western valley slopes of the adjacent Seacomb Bottom. Although the field system is under statutory protection through scheduling, additional lynchets associated with the system were mapped and recorded as cropmarks on aerial photographs outside the scheduled area.

The surviving field system appears to be confined to a north-south strip approximately 1 km wide contained within two long linear field boundaries running roughly due north from the cliff-edge. These boundaries, which may have once defined the edges of adjacent medieval manors or holdings, possibly have earlier prehistoric origins. With the sea defining the boundary to the south and the village of Worth Matravers and the road to the north, the field system covers an area of over 155ha, Figure 66.

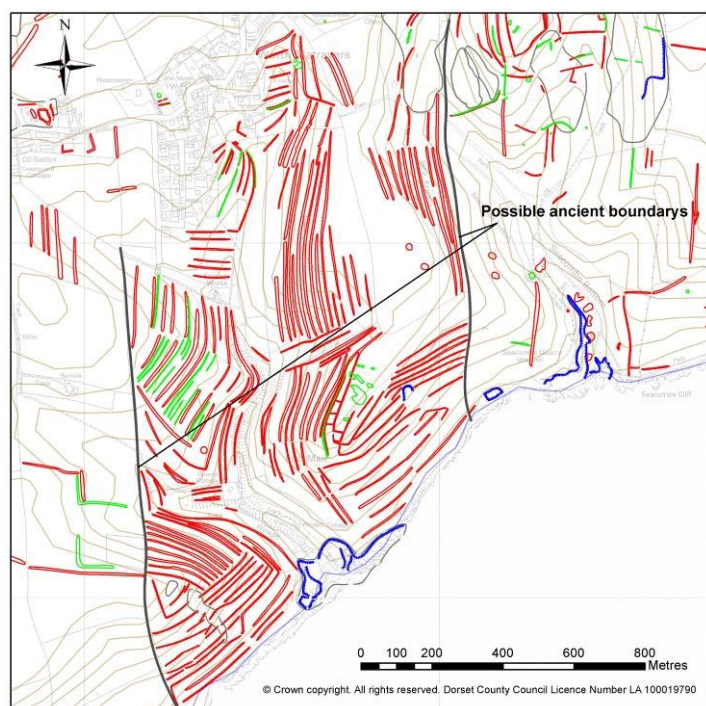


Figure 66. Medieval contour strip lynchets at Worth Matravers.

NMP mapping © English Heritage.

Many of the strip lynchets and field systems recorded during the project partially survive as upstanding monuments and have therefore been noted in the past, surveyed by the OS field surveyors and are consequently recorded in the Dorset HBSMR. Despite this, significant extra detail was added to many of these systems of lynchets during the mapping project.

6.8.3 Medieval ecclesiastical sites and castles.

The ruins of three medieval chapels and churches and one castle were recorded during the project. These included St Gabriel's Chapel, Stanton St Gabriel (MDO2465), St Aldhelm's Chapel, Worth Matravers (MDO8367) and the ruins of St Andrew's Church, Portland (MDO6500). Features associated with the late fifteenth century Rufus Castle with its nineteenth-century approach bridge were also mapped (MDO6505).

As important upstanding structures, all had previously been recorded in the Dorset HBSMR and were well known through documentary evidence.

6.8.4 Other Medieval sites

Green Island Causeway, Poole Harbour (MDO7455). The presence of an ancient causeway connecting Cleaval Point to Green Island has long been known in a local legend and was confirmed in 1959 by the Dorset Natural History and Archaeological Society (Bugler 1966). A stone-ramped structure was identified and given a medieval date although an earlier Roman date for the crossing has been suggested. Two linear banks at either end of the causeway were visible on aerial photographs taken in 2008 and recorded during the project.

Stoborough Mound, (MDO7048). The potential site of a medieval motte has previously been suggested at Stoborough where a large natural hillock, much altered in recent times, is located. The mound was visible on aerial photographs taken in 1945 although no evidence for its suggested medieval restructuring was identified.

6.9 NMP results: Post medieval or early twentieth-century sites (AD1540 - AD1939)

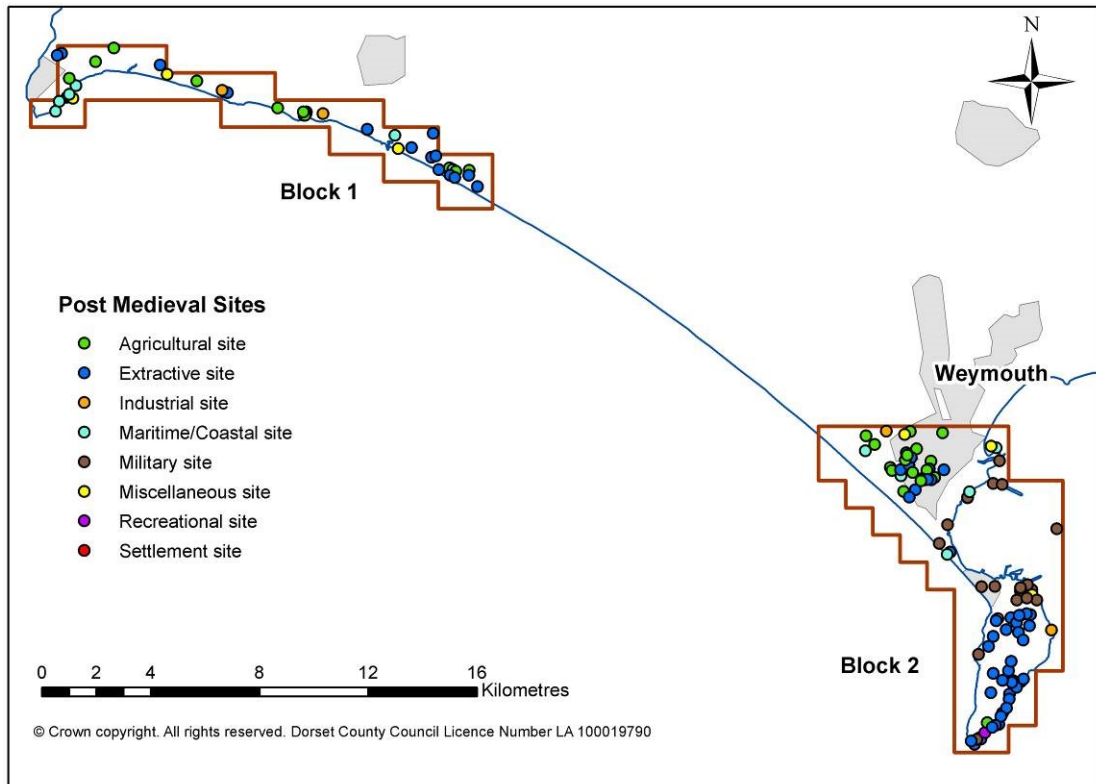


Figure 67. Distribution of post medieval sites, Blocks 1 and 2 (west)

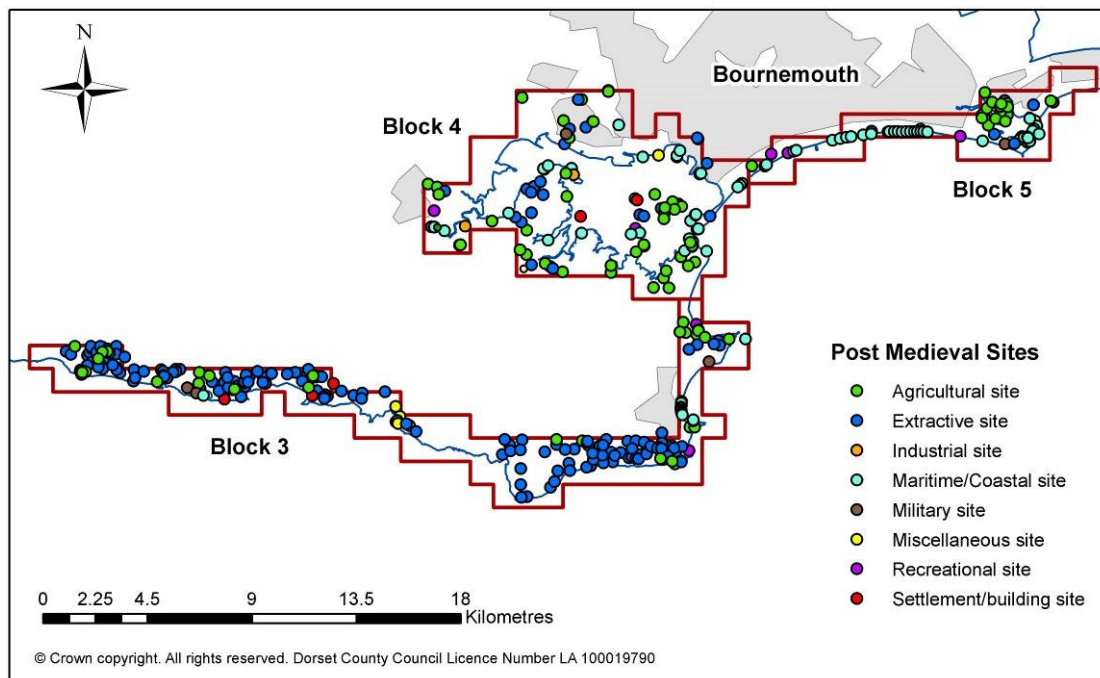


Figure 68. Distribution of post medieval sites, Blocks 3, 4 and 5 (east)

During the mapping project 20% (341) of sites identified were attributed a post medieval date. In addition, a further 228 sites were allocated a post medieval or possible early twentieth-century date; these were generally features such as extractive pits and drainage systems which could be nineteenth (post medieval) or

early twentieth century (modern) in origin or Victorian features which spanned the two centuries.

Combined, these 569 sites amounted to over a third of all site records recorded during the project. This is a period that has, up until fairly recently, not been the primary focus for archaeological survey and field investigation and therefore 407 (72%) of sites were new to the record.

The majority (56%) of these post medieval monuments survive as extant or partially extant earthworks and structures; 44% were cropmarks, levelled earthworks or destroyed or demolished structures.

As with all interpretations based on aerial photographic or lidar evidence alone, precise dating can be problematic. Many of the sites attributed to the post medieval period may have had their origins in the medieval period; for example the numerous extractive pits described in Section 6.9.2. below. Many more potentially post medieval sites were encountered during the mapping project, however as some may have had earlier medieval origins they were given a more general date range and are described in Sections 6.10 (Historic) and 6.12 (Undated) below.

Site Type	No: Sites
Alum Works	1
Artillery Fort/Coastal Fort	4
Bank (earthwork)	3
Beach Hut	4
Boat House	2
Boundary. Boundary Bank	2
Bowling Green	1
Breakwater/Mole/Sea Defences	5
Brickworks	2
Building/Building Platform	4
Canal	1
Cement Works	1
Chalk/Clay/Gravel/Sand/Extractive Pit	163
Coastal Battery/Battery	4
Coastguard Station	2
Clay Works	1
Cultivation Marks/Terrace	13
Drain/Drainage Ditch/Drainage System	38
Enclosure	7
Field Boundary	42
Firing Range/Rifle Range	6
Flagpole	1
Flood Defence	2

Folly	1
Fuel Store	1
Garden Feature	3
Groyne	42
Industrial Building/Warehouse	3
Hospital	3
Jetty/Landing Stage/Pier/Quay	30
Kiln/Lime Kiln	3
Limestone Quarry/Quarry/Shaft	87
Measured Mile	1
Military Building	2
Mound	1
Munitions Factory	1
Pillow Mound	5
Pipeline	1
Pond/Reservoir	2
Ring Ditch	1
Salt Works/Saltern	2
Settlement	3
Spoil Heap	9
Structure/Wall	2
Torpedo Station	2
Trackway	37
Tramway	1
Vinery	1
Water Meadow	1
Wreck	15
Total	570

Table 8. Post medieval or twentieth-century site types

6.9.1 Agricultural features

Of the 570 post medieval sites recorded during the project, 139 (24%) were associated with agricultural activity. These monuments included 13 cultivation marks and 38 drains and drainage systems. Forty two field boundaries associated with post medieval Parliamentary field systems were identified, being distinguishable from medieval boundaries by their ruler-straightness.

In addition to the above sites, 37 trackways were allocated a post medieval date and five possible pillow mounds identified.

The most extensive area of post medieval cultivation features lay in the northern portion of Block 2 to the west of Weymouth. Here extensive field systems enclosing

drainage systems and cultivation marks are located on the low-lying ground on the landward side of The Fleet (Figure 68), a proportion of which has been lost by expansion of the town in the twentieth century.



Figure 69. Post medieval or early twentieth-century drainage systems to the west of Weymouth NMP mapping © English Heritage.

Rabbits were a particularly important commodity from the medieval period onwards and warrens were established for the breeding, rearing and capture of rabbits and hares. Warrens incorporated artificial mounds known as pillow mounds often set within an enclosure. The pillow mounds were constructed as habitation and breeding places and often had stone-lined tunnels constructed within the soft soil mound allowing further burrowing (Williamson 2007).

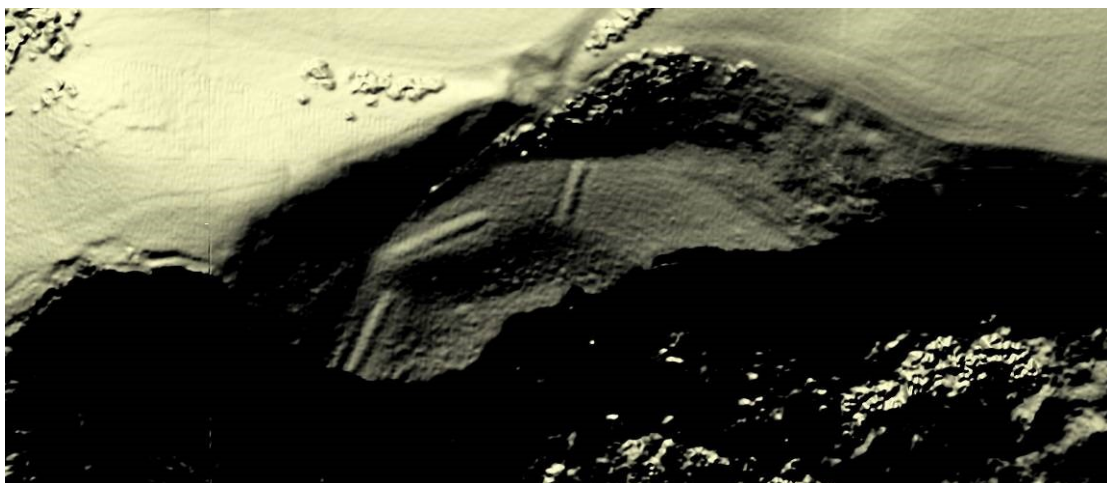


Figure 70. Possible post medieval pillow mounds on the CCO lidar close to the cliff-edge on Dog House Hill, Chideock

MDO7655 © Cornwall Council 2013 based on Channel Coast Observatory data 2009.

Five possible post medieval pillow mounds were identified on the CCO lidar taken in 2008 close to the cliff-edge on Dog House Hill, Chideock (MDO29574-8) Figure 70. Three of the linear mounds are very prominent on the lidar located on a curved section of slumped cliff which forms a natural enclosure. The mounds are between 26m and 48m long and are flanked by shallow ditches. Two less prominent linear mounds were also identified in the vicinity.

6.9.2 Extraction sites

The most common site types assigned a post medieval date were those associated with extraction. Of the 259 extractive sites, 172 (66.4%) had previously been recorded in the Dorset HBSMR. This is a relatively high number of previously known sites of this type; in neighbouring Hampshire, only 2% of extractive sites recorded during the Hampshire Downland NMP had previously been recorded in the county HER (Royall 2013b, 70) and in the New Forest this figure was only 1% (Royall 2013a, 65). On the South Dorset Ridgeway, only 8% of all post medieval sites had previously been recorded, (Royall 2011, 58).

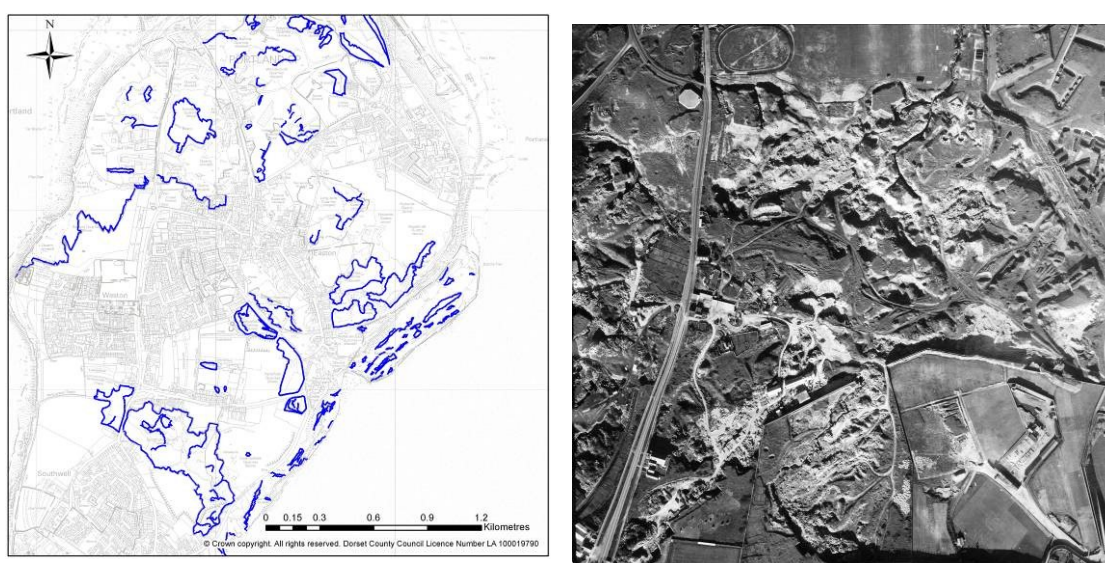


Figure 71. Post medieval and twentieth-century Portland Limestone Quarries

Photograph: RAF 541/385 Frame 4010 08-NOV-1949 English Heritage RAF photography. NMP mapping © English Heritage.

The majority (87%) of the previously recorded extractive sites encountered in this current project related to large limestone quarries, particularly on Portland and along the coast to the east of St Aldhelm's Head, many of which are marked on the OS First and/or Second Edition maps. Most of the new sites were smaller extractive pits and spoil heaps.

The extractive features are widely scattered across the project area although are more concentrated on Portland and along the Block 3 coast where they are associated with limestone quarrying. Many of the quarries were small to medium sized cliff-top quarries where the limestone was readily exposed in the cliff face. The cliff quarries were worked inwards from the cliff and the expense of moving a great depth of unusable stone above the good quality Under Freestone meant quarrying often extended into underground galleries (Stanier 1996). Good examples of cliff quarries are located on south-east coast of Portland and are visible in Figure 65 above.

6.9.3 Industrial sites

Thirteen sites associated with post medieval industry were identified on the aerial photographs and lidar.

One of the most interesting lies at Kimmeridge where remains of a quay, jetties and breakwaters associated with Sir William Clavell's seventeenth-century alum works are located (Figure 72). The alum works operated from 1605 to 1618 (when it was forced to close by King James I), after which time the site was converted to salt extraction. The foundations of a large stone structure are visible on aerial photographs taken in 2008. The structure is considered to be the quay which was built during a second phase of the alum works by Clavell, after the king finally gave him permission to recommence the manufacture of alum (Parkins 2013). The second phase also included a glassworks. These industrial ventures were positioned at Kimmeridge due to the ready supply of fuel for the furnaces in the form of the oil-rich bituminous shales exposed in the cliff (see section 4.3.3).



Figure 72. Remains of a quay associated with the seventeenth-century alum works at Kimmeridge
 MWX645: Photograph: SY9078NE-20080624.ecw courtesy of the Channel Coastal Observatory

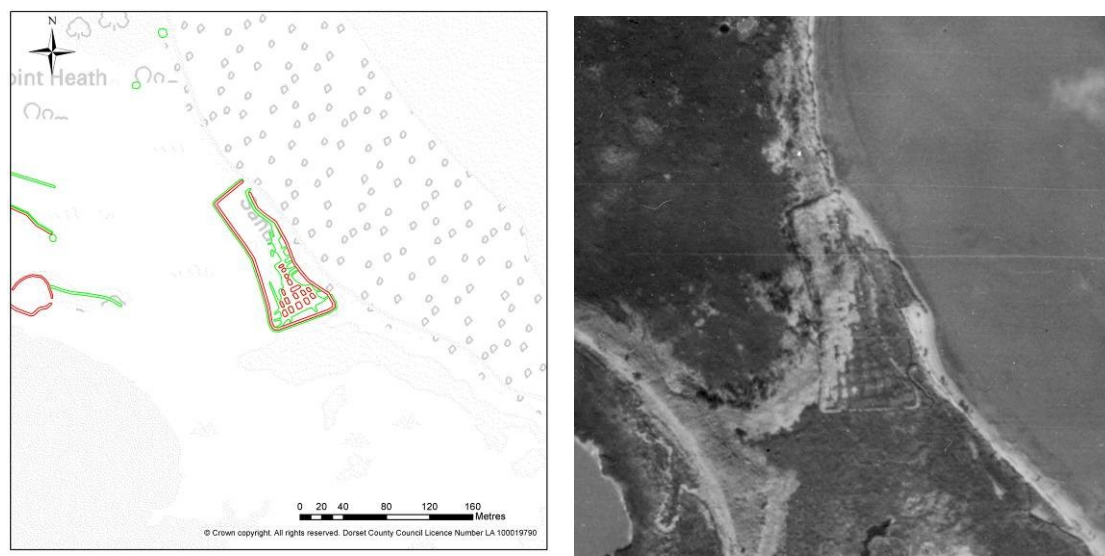


Figure 73. Possible post medieval saltern on Gold Point Heath, Arne
 MWX4736. Photograph RAF CPE/UK/1934 Frame 3045 17-JAN-1947 English Heritage RAF photography. NMP mapping © English Heritage.

Other post medieval industrial sites include a disused cement works at Ridge, Arne (MWX4118) and a possible Saltern at Gold Point Heath, Arne (MWX4736). At Gold Point Heath, a rectilinear enclosure (127m by 35m) was identified on aerial photographs taken in 1947 (Figure 73). A grid-like pattern of rectilinear structures is situated at the southern end of the enclosure which was interpreted as relating to the salt industry by the interpreter. It is possible that the rectilinear features are solar evaporation tanks or salinas; the site has a ready supply of sea water, the enclosure being located on sand immediately adjacent to the high-tide line on the east side of the Point.

6.9.4 Maritime/Coastal Sites

In addition to the seventeenth-century quay described in 6.9.3 above, 97 maritime or coastal sites were plotted. These included coastal defence sites such as groynes and breakwaters; sites associated with mooring and docking of vessels (jetty, pier, landing stage and quay) and 15 wrecks. The largest concentration of sites lies within Poole Harbour and along the Bournemouth to Highbridge coastal strip.

To the west of Swanage, between Durlston Head and Anvil Point, four structures are associated with a nautical measured mile (MWX5008). The site comprises two pairs of towers or beacons marking the beginning and end of a nautical mile at sea. The western pair of towers are located 640m to the east of Blackers Hole and the eastern pair to the north west of Tilly Whim Caves. The towers were used to measure the performance of ships by timing their progress across the mile. The mile was commenced when the first of the first pair of towers lined up and completed when the ship crossed the line marked by the lining up of the second pair.

6.9.5 Military Sites

Twenty sites relating to post medieval military activity were plotted. These included the Tudor coastal artillery fort of Sandsfoot Castle, Weymouth (MDO6598) which was built in 1541 as one of a series defending the anchorage between Weymouth and Portland. Six other coastal batteries or forts were recorded in the project area, all dating to the nineteenth century and all forming part of the ring of defence around Portland and Weymouth. These included: Breakwater Fort on the Outer Breakwater, Portland MWX1380; High Angle Battery, Portland (MDO6569, Figure 23), Nothe Fort MDO6676 and East Weare MWX1365.

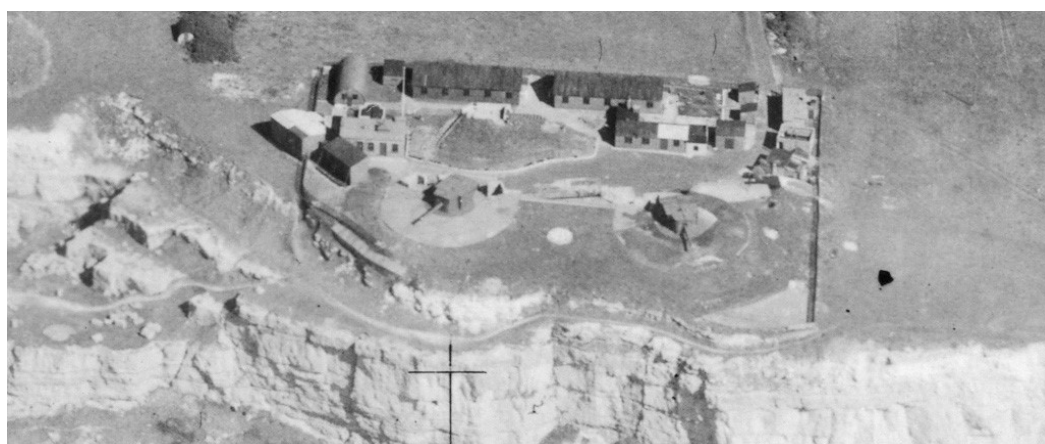


Figure 74. Nineteenth-century coastal battery, Blacknor, Portland

MWX435 Photograph: RAF 30099 Frame 0132 07-MAY-1948 English Heritage RAF photography.

Blacknor Battery lies on the west side of Portland and was one of two planned late nineteenth-century coastal batteries intended to defend the West Bay area from Portland to Durdle Door. Blacknor was constructed but its partner fort, at Durdle, was not (MWX435). The battery remained in commission until the Second World War, the two gun batteries being clearly visible on oblique RAF photographs taken in 1948 (Figure 74).



Figure 75. The Verne Citadel, nineteenth-century coastal battery, Portland

MDO6577. Photograph RAF CPE/UK1821 Frame 1408 04-NOV-1946 English Heritage RAF photography. NMP mapping © English Heritage.

The largest nineteenth-century coastal artillery battery in the project area is that of the Verne Citadel, Portland (MDO6577). This fort was built between 1857 and 1881 to protect Portland Roads and Weymouth Harbour. It is protected by a massive redoubt enclosing 22ha. The defensive ditches are up to 20m deep and 35m across, the quarried stone being used in the construction of Portland Harbour breakwaters. The battery was no longer in commission by the 1900s but was reused during the Second World War. It is now used as a prison (Figure 74).

The sites of two torpedo stations are located on the north end of Portland Harbour on the northern breakwater. A 'Torpedo Range Circling Area' is marked on the Admiralty chart of 1937 between Sandsfoot Castle and the southern end of the breakwater. A short range pier was constructed on the west side of the breakwater (MWX4411) and a smaller long range station midway down the breakwater on the east (seaward) side (MWX4412). Both are visible on the RAF photographs taken in 1946 (Figure 75) and structures associated with the stations are still extant today.

Six nineteenth-century and/or early twentieth-century rifle ranges are located within the project area for which firing butts or associated structures could be identified from the photographs. The ranges included: Ballard Down, Studland (MWX3092), Dungy Head, West Lulworth (MWX3984 and MWX4418), Ham Common rifle range, Hamworthy, Poole (MWX4241), Chesil Beach, Portland (MWX4373) and Kings Pier Hollow, Portland (MWX4380).



Figure 76. Late nineteenth and early twentieth-century torpedo stations on Portland Harbour north breakwater.

MWX4411 and MWX4412.
Photograph RAF CPE/UK1821
Frame 544404-NOV-1946 English
Heritage RAF photography.

6.9.6 Recreational Features

Ten sites associated with late nineteenth-century recreational activities were recorded. The included late nineteenth-century or early twentieth-century beach huts along the seafront between Bournemouth and Chichester (MDO28620, MDO28847 and MDO28937) and Wareham bowling green (MDO8115). Several garden features were also identified including those on Furzey Island, Poole Harbour (MDO28699) where a complex of paths, tree avenues and planting beds were identified as earthworks and structures on aerial photographs taken in 1951 prior to the construction of industrial buildings associated with a modern oil well.

6.9.7 Settlements

Features associated with three post medieval settlements were mapped including Worbarrow, Tynham (MDO29454), Tynham (MDO29457) and nineteenth-century workers housing at Maryland, Brownsea Island (MWX3075).



Figure 77. The abandoned hamlet of Worbarrow, Tynham.

MDO29454. Photograph: RAF 106G/LA200 Frame 2003 27-MAR-1945 English Heritage
RAF photography.

At Tynham parish, the entire village and associated coastal hamlet of Worbarrow were abandoned in 1943 after being requisitioned by the military for training purposes during the Second World War. Many of the buildings within the village including the church and school still survive and are open to the public when the Lulworth Ranges are not active. Cottages and agricultural buildings associated with the hamlet of Worbarrow are upstanding only as derelict or ruined structures (Figure 77).

6.9.8 Miscellaneous post medieval features

In addition to the above sites, 28 miscellaneous features were allocated a post medieval date including seven enclosures and two ponds or reservoirs.

One of the most dominant features of the Block 3 coastline is the seventeenth-century Folly of the Clavell Tower, Kimmeridge (MWX646). The folly, which was constructed in 1820 by the Reverend John Richards, is a listed building (National Heritage List for England:1120474) and was under threat from cliff erosion. It was therefore repositioned in 2006; its current location being 25m inland from its original position. The original position of the tower is visible to the south-west of the current location on the Channel Coast Observatory photograph taken in 2008 (Figure 77).



Figure 78. The Clavell Tower. A seventeenth-century folly repositioned in 2006

MWX645: Photograph: SY9078NE-20080624.ecw courtesy of the Channel Coastal Observatory

6.10 NMP results: Historic (early medieval or later) sites (AD410 - AD1900)

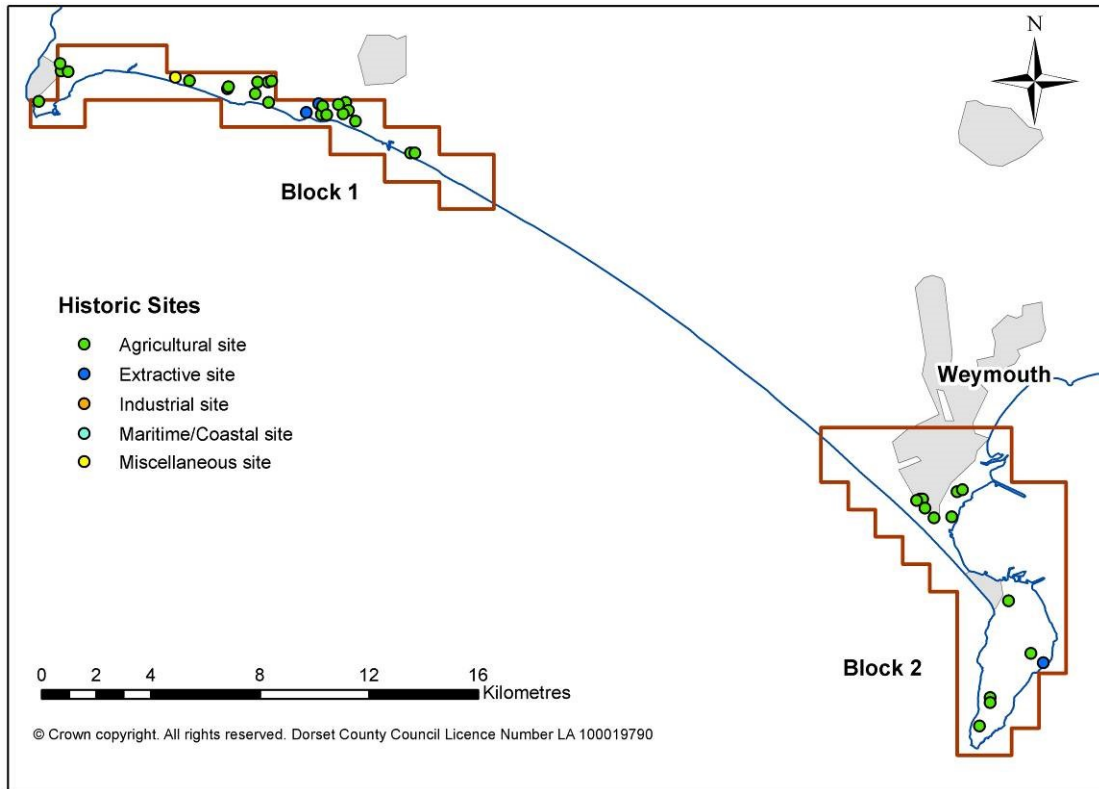


Figure 79, Distribution of Historic sites, Blocks 1 and 2 (west)

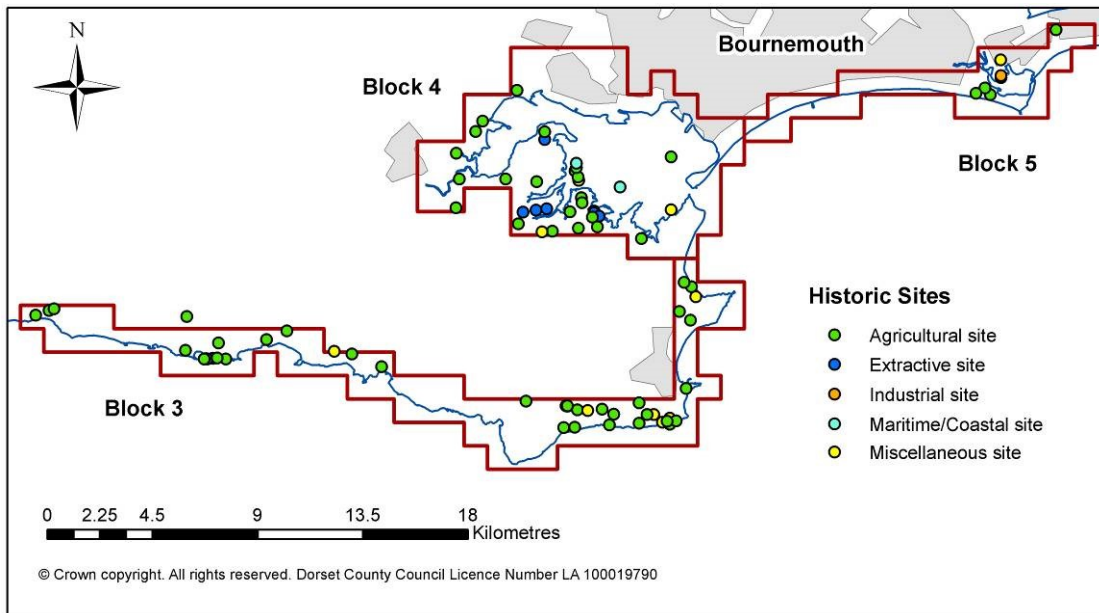


Figure 80. Distribution of Historic sites, Blocks 3, 4 and 5 (east)

The nature of much of the evidence recorded during the project meant that for many sites it was not possible to ascribe a more precise date than Roman/post Roman or later in origin. This was particularly true for agricultural features such as field boundaries, fragments of field systems, trackways and areas of parallel cultivation marks (ridge and furrow) which could have been medieval or post medieval in date. Where a more specific date could not be determined from the aerial photographic evidence, these sites have been attributed a general historic date.

Site Type	No: Sites
Boundary Bank	2
Building	1
Canal	1
Cultivation Marks	6
Drain, Drainage Ditch	3
Enclosure, Pound	6
Extractive Pit, Quarry	11
Field Boundary, Field System	46
Fish Trap	2
Pillow Mound	4
Ridge and Furrow	6
Salt Works	1
Strip Lynchet	7
Trackway	23
Water Meadow	4
Total	123

Table 9. Historic site types

Of the 123 records allocated an historic date, 68% were still visible as upstanding or partially upstanding earthwork monuments, the remaining 32% being completely plough-levelled or demolished structures. All but ten sites (92%) had previously not been recorded in the Dorset HBSMR. Sites included 69 linear features interpreted as field boundaries or trackways, 12 areas of ridge and furrow or cultivation marks and 11 extractive pits and quarries.

6.10.1 Fish Traps

The sites of two potential fish traps were identified during the project, both lying within Poole Harbour. These included a small sub-rectangular hollow identified in marshland on the eastern side of Long Island, Corfe Castle (MDO29015) which was interpreted as being associated with historic fishing activities.

Within the intertidal area to the east of Furzey Island, a V-shaped feature was identified on aerial photographs taken in 1959. The feature was identified as a possible medieval or post medieval fish trap on the strength of its morphological characteristics. The arms of the trap were 60m and 73m in length with the open end of the V pointing north west up the narrow channel between Furzey and Green islands. The feature was therefore sited in a good position and orientation for catching fish on the out-going tide (Figure 81).



Figure 81. Potential site of a medieval or post medieval fish trap to the east of Furzey Island, Poole Harbour.

MDO28700. Photograph: RAF 58/2843 Frame 0109 06-MAY-1959 English Heritage RAF photography.

6.10.2 Pillow mounds

In addition to the post medieval pillow mounds on Dog House Hill described in section 6.9.1 above, four pillow mounds of medieval or post medieval date were plotted. Three of these lie within the parish of Worth Matravers (MDO8374 and MDO29204-5). A fourth potential pillow mound was identified at Thorncombe Beacon, Symondsburry (MDO2659).

At Worth Matravers, three linear mounds are located on a south-facing slope, overlooking Seacombe Bottom. The mounds lie on a possibly natural terrace and one has been previously recognised as a pillow mound and is protected by scheduling. The scheduled mound is 20m long and flanked on its south side by a ditch (MDO8374). To its south east lies a second wider mound with a possible ditch on its north side (MDO29205) and to the west a third mound (MDO29204). The third mound is the shortest of the three being only 12m long; it is also the least well pronounced. All three mounds are possible pillow mounds although only one has been scheduled, the other two being interpreted by the RCHME field investigator as cut terraces (AMIE record UID 456484).

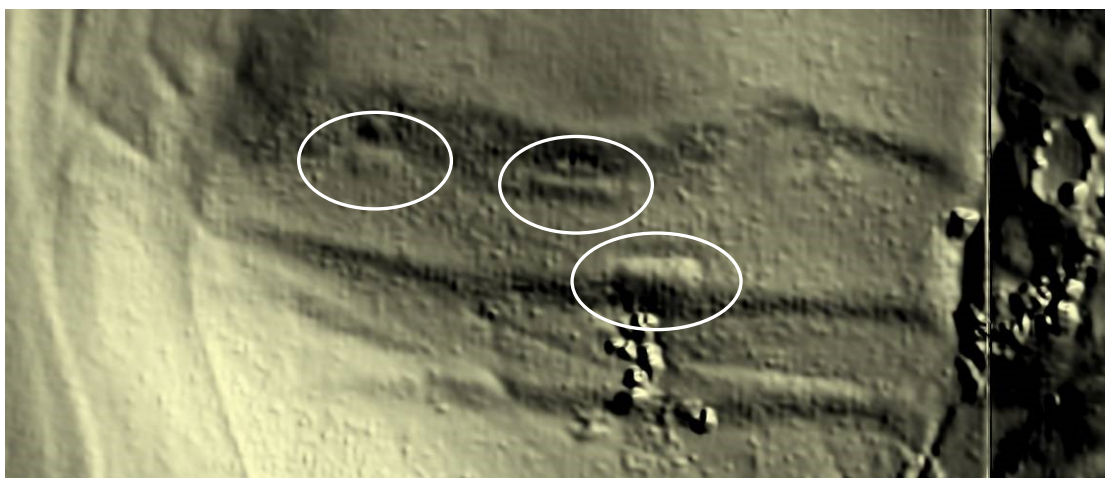


Figure 82. Possible medieval or post medieval pillow mounds on the CCO lidar Worth Matravers MDO8374, MDO29204-5 © Cornwall Council 2014 based on Channel Coast Observatory data 2009.

6.10.3 Enclosures

Six enclosures of medieval or post medieval origin were recorded; these included two sites on the south-west side of Poole harbour which were specifically recorded as possible animal pounds.

The first lies to the south west of Wytch Farm at the northern end of Wytch Heath. Here a large near-circular bank and ditched enclosure was identified on aerial photographs taken in 1952 (Figure 83). The enclosure is 137m across and lies within a larger polygonal enclosure marked as Wytche Fir Pound on the OS 1st Edition map. The curvilinear enclosure is considered to predate the rectilinear fir plantation enclosure which is likely to be of post medieval date. The site has since been destroyed by the construction of a modern oil gathering station.

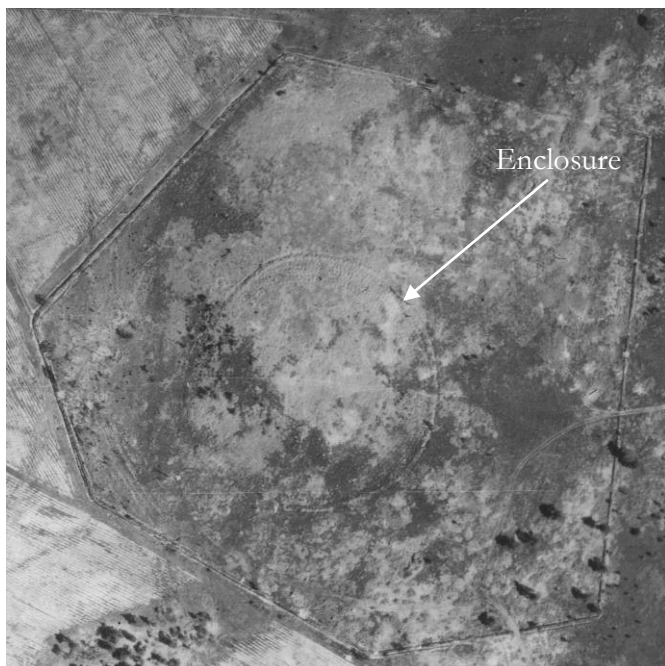


Figure 83. Historic animal pound on Wytch Heath.

MDO28700. Photograph: RAF 540/723 Frame 5026 09-MAY-1952 English Heritage RAF photography.

Further south east at Studland, a sub-oval enclosure 110m long is visible as earthworks on photographs taken in 1946 (Figure 84). The site was interpreted as a medieval or later animal pound although an earlier origin is possible. The enclosure is no longer visible on recent aerial photographs published on Google Earth, the earthworks having been levelled presumably as a result of agricultural land improvement – the field in question now appearing to be under improved grassland.



Figure 84. Possible historic animal pound at Studland.

MDO29067. Photograph: RAF CPE/UK1893 Frame 3308 12-DEC-1946 English Heritage RAF photography.

6.11 NMP results: Twentieth-century sites (AD1901 onwards)

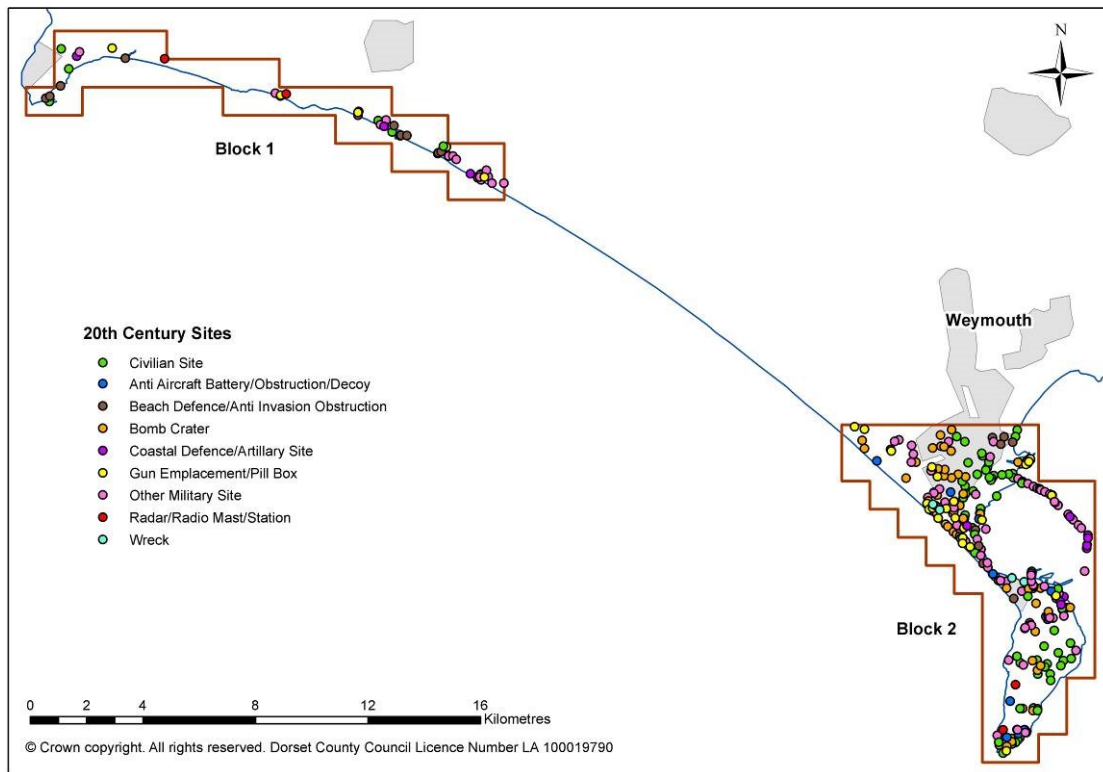


Figure 85. Distribution of twentieth-century sites, Blocks 1 and 2 (west)

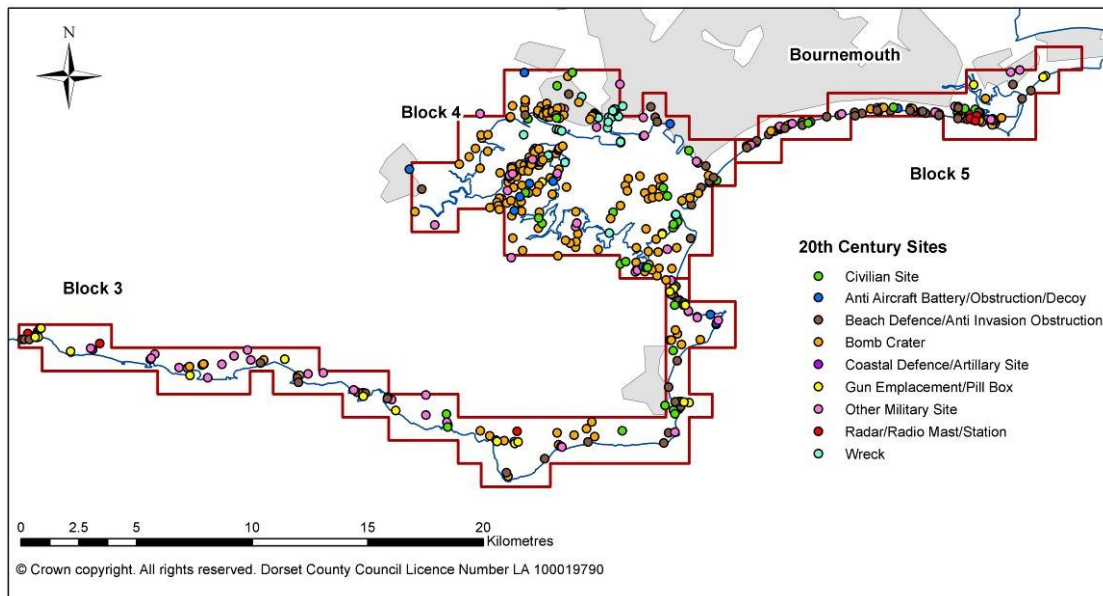


Figure 86. Distribution of twentieth-century sites, Blocks 3, 4 and 5 (east)

As part of the NMP remit, all early twentieth-century sites predating the end of the Second World War (1945) are mapped and recorded including all military features relating to the War itself. Features post dating 1945 were not generally plotted unless they were abandoned military features associated with the Cold War. The project did not record structures still in use or preserved in later structures that are still in use and therefore did not map extant field boundaries, roofed buildings, canals, railways or twentieth-century drainage features (see Appendix 1, Methodology).

Site Type	No: Sites
Accommodation Hut	1
Air Raid Shelter	4
Aircraft Obstruction/Anti Landing Obstacle	6
Airfield/Military Airfield	3
Allotment	33
Ammunition Store	1
Anti Aircraft Battery/AA Gun Post/HAA/LAA	17
Anti Tank Block/Cube/Ditch/Obstacle	55
Ball Clay Works	1
Band Stand	2
Bank (Earthwork)	4
Barbed Wire Entanglement/Obstacle/Enclosure	20
Barn	1
Beach Defence/Scaffolding	34
Boat House	2
Bomb Crater	248
Bombing Decoy	2
Bombing Range Target	1
Building/Building Platform	10
Chain Home Station	4
Coastal Artillery Searchlight	8
Coastal Battery	11
Coastal Observation Post	1
Defence Line/Work	3
Drainage Ditch/System	3
Emergency Water Supply	3
Enclosure	2
Extractive Pit	3
Field Boundary	2
Firing Range	4
Fuel Store	4
Groyne	2
Gun Emplacement	5
Hard	1
Hill Figure	1

Hospital	1
Jetty/Landing Stage/Pier	7
Limestone Quarry	18
Military Building	59
Military Camp	7
Military Road	5
Military Site	29
Minefield	3
Mound	2
Munitions Factory	1
Observation Post	1
Phoenix Caisson	3
Pillbox	60
Pipeline	3
Practice Trench/Slit Trench	33
Public Convenience	1
Radar Mast/Radar Station/Radio Mast	12
Rocket Post/Rocket Test Facility	2
Royal Naval Base/Seaplane Base	2
Spigot Mortar Emplacement	2
Spoil Heap	1
Storage Tank	2
Structure	3
Target	1
Torpedo Station	3
Trackway	4
Training Area/Camp	2
Tramway	1
Wall	2
Weapons Pit	5
Wreck	52
Total	829

Table 10. Twentieth-century site types

Twentieth-century sites formed the largest group of monuments encountered during the project with 829 sites recorded. Of these, 685 (83%) were new to the record and 688 (83%) were military sites related to First or Second World War. This represents a significant enhancement of baseline data for this important period of the recent past.

Civilian sites not relating to military activity included trackways, field boundaries,

buildings and quarries as well as coastal jetties, piers and landing stages. Thirty three allotments were recorded, the greatest concentration being in the vicinity of Weymouth. Others were mapped on Portland, and associated with the urban areas of Swanage and Lyme Regis. In addition, buildings and structures relating to the early twentieth century infectious diseases hospital at Granby Road, Weymouth were identified (MDO23149).

6.11.1 First World War military features

A small number of sites associated with First World War or inter-war military activities were identified during the project. These included a battery observation post (MWX1373) and torpedo station (MWX1492) on North-eastern Breakwater Portland, and Chickerell Airfield (MDO29765), see 6.11.12. Additional sites included buildings and structures associated with the Royal Naval cordite factory on Holton Heath, Wareham St Martin (MDO8224) and the Royal Naval First and Second World War seaplane base, HMS Sereptia, Castletown Portland (MDO29763).



Figure 87. Fleet Rifle Range, Chickerell

MDO893 and MDO29743. Photograph: CCC 11752/832 Date unknown. © English Heritage (Crawford Collection).

Fleet Rifle Range is marked on the 3rd Edition OS map at Chickerell and is part of the Wyke Regis Training Area. Butts, buildings and barracks associated with the later range (MDO893), were mapped from aerial photographs taken in the 1940s; the main ranges being orientated NE-SW. The range itself dates from the First World War and a butts associated with the earlier range were identified on early Crawford photographs (Figure 87 and 102). One of the original First World War ranges appears to have been orientated north-south (MDO29743).

On the southern tip of Tidmoor Point, an extensive area of military practice trenching was identified on aerial photographs taken in 1946, just beyond the rifle range described above. The form of the trenching is suggestive of it dating to or just after the First World War (Figure 88); indeed the trenching is visible towards the top left of the 1920's Crawford image above (Figure 87).



Figure 88. Possible World War One practice trenching at Tidmoor Point, Chickerell, Airfields

MDO29067.

Photograph: RAF
CPE/UK1893 Frame
3308 12-DEC-1946
English Heritage RAF
photography.

6.11.2 Second World War military features

During the Second World War, the entire length of the south coast of England became the front line of the European conflict and was fortified in anticipation of invasion. Large areas of the countryside were requisitioned for military training areas, camps and for the construction of airfields. The South Dorset Coast being in a prime location on the south coast, relatively unpopulated and in close proximity to the important urban centres of Weymouth, Poole and Bournemouth, was greatly affected by the war.

The majority of twentieth-century sites encountered relate to anti-invasion defences associated with the fortification of Britain in 1940 and 1941 after the evacuation of British troops from Dunkirk in June 1940. Whilst most personnel were brought back, much of the army's heavy equipment including vehicles, tanks and artillery were left behind in France and Belgium. At this time there was an urgent need to restructure and reinforce army supplies and at the same time build defences in response to the threat of invasion from occupied France (Dobinson 1996a).

6.11.2.1 Airfields

Two military airfields are situated within the project area.

The first lay less than a kilometre to the east of the firing range and camp at Chickerell, (6.11.1). The airfield was first opened in 1918 and used by the Royal Naval Air Squadron for anti-U-boat patrols. During the Second World War, the airfield was used as a forward landing aerodrome for aircraft using the Chesil Beach Bombing Range (Hampshire Airfields 2014). The airfield only ever had a grass runway and therefore only ancillary structures associated with the site of the airfield were identified from aerial photographs (MDO29765).

More extensive features associated with Christchurch Airfield (MDO28774 and MWX1164) were identified and mapped during the project. The airfield was opened in 1935 and closed at the start of the Second World War. It was reopened almost immediately to house the Air Ministry Research Establishment and during the war was involved in the conversion of Spitfires to Seafires. It was used as an advanced landing ground between 1943 and 1944. Advanced landing grounds were temporary airfields constructed to provide forward operating bases to support the preparation of the Allied advance in Europe (Lowry 1996). They could be quickly constructed using

prefabricated runway material and those constructed on the continent could be repurposed once the frontline moved. An attempt to disguise the airfield was made by camouflaging it with fake field boundaries, painted black onto the ground surface. These painted field boundaries are visible in Figure 89, the aircraft themselves giving away the presence of this otherwise disguised airfield.

The airfield was greatly expanded towards the end of the war when it was used by the United States Army Air Force (USAAF) during the preparations for D-Day. After the war the airfield was used as an aircraft manufacturing site before closure in 1962. The area is now completely redeveloped with modern residential housing.



Figure 89. Christchurch camouflaged airfield.

MDO28774 and
MWX1164.
Photograph
RAF225D/UK848
Frame 2683 25-JUL-
1940 English Heritage
RAF photography .

6.11.2.2 Anti-Aircraft Batteries and Coastal Batteries

German aerial bombing raids over Britain were most intensive during the winter of 1940-41. Important urban installations and dockyards were targeted by the Luftwaffe during the 'Blitz'. Less intensive bombing continued throughout the war before intensifying once again in 1944 (Dobinson 1996). Anti-aircraft guns were first deployed in England as a response to the First World War and by 1939 were distinguished between heavy anti-aircraft artillery (HAA) for high-flying bomber aircraft and light artillery (LAA) as a defence against low-flying aircraft. Artillery batteries were most extensive across England in the later years of the Second World War with Operation Diver, the code name given to the defensive actions taken against the German flying-bomb. *Diver* was developed during the spring of 1944 and between June 1944 and March 1945 a series of anti-aircraft guns, searchlights, radar and early warning installations were developed across the south of England (Dobinson 1996 and 1996c).

Portland and Poole harbours were extremely important strategically during both the First and Second World Wars lying on the south coast and offering secure harbour for naval ships. Portland Harbour itself was protected by a ring of light and heavy anti aircraft batteries and coastal batteries many of which are still in a good state of preservation. The sites of 19 anti-aircraft batteries and gun posts were identified during the project in addition to 11 coastal batteries.

One site which has since been completely demolished by modern development was located at Southwell, Portland (MWX4703); here a heavy anti-aircraft battery was

identified on aerial photographs taken in 1948 (Figure 90). The site comprises a ring of four circular gun emplacements around a central command post with associated accommodation and officers quarters to the north. The battery appears to have been later embellished with the addition of two rectangular gun emplacements immediately to the west of the original group.



Figure 90. Second World War heavy anti aircraft battery, Southwell, Portland

MWX4703. Photograph RAF 106G/UK/1411 Frame 5052e 2683 20-JUN-1948 English Heritage RAF photography.

6.11.2.3 Anti-landing Obstacles

The expected invasion of Britain was considered most likely to combine an invasion force landing on the beaches combined with parachute and glider troops landing inland. Following the evacuation from Dunkirk, the Home Executive were tasked with constructing anti-landing obstacles as a matter of urgency. Potential areas suitable for the operation of troop carrying aircraft were made unfit to land on being systematically obstructed with trenches, poles, scaffolding and barbed wire. These obstructions were one of Britain's earliest anti-invasion defences and became the most extensive (Dobinson 1996a). Work began in May 1940 on areas within five miles of operational airfields and continued until autumn 1941. Potential landing grounds were to be obstructed by trenches dug on a chequer board pattern with sides of 150 yards. The approved method issued by War Office on 27th May 1940 was for the trenches to be four feet wide and flanked with spoil heaps to enhance the obstacle. (*ibid*, 134).

Six areas of probable anti-landing obstacles and trenching were identified during the mapping, the largest concentration being located towards the southern end of Portland near Portland Bill. This elevated and relatively flat plateau may have been considered vulnerable to landing enemy aircraft and therefore extensive groups of mounds and linear trenches were constructed within the medieval strip field systems described in section 6.8.2. Figure 91.

To the north of Poole Harbour on the flat valley floor of the River Sherford, a small area of trenching was identified (MDO29471) to the south west of Upton. The features comprise a long linear ditch cut diagonally across a large flat field at French's Farm (Figure 92). The main ditch has been bisected perpendicularly by two other ditches effectively preventing the field being used as a landing strip for small aircraft.



Figure 91. Anti landing obstacles at Portland Bill

MDO29662-4 and MDO29677. Photograph RAF 106G/UK1441 Frame 4051 13-APR-1946
English Heritage RAF photography

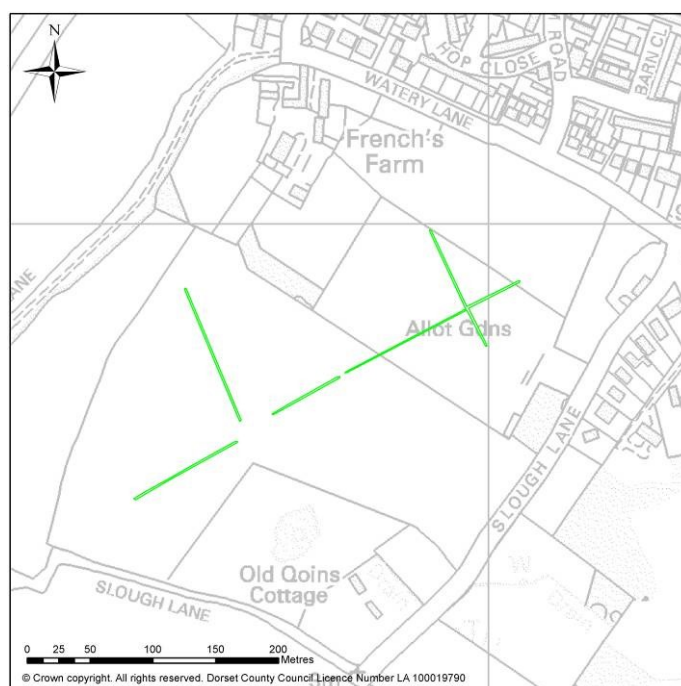


Figure 92. Potential Second World War anti-landing trenches at Upton, Lynchett Minster

NMP mapping © English Heritage.

6.11.2.4 Beach defences.

After the evacuation of British forces from Dunkirk in 1940 and the ensuing threat of invasion from Germany, on 27 May 1940 a Home Defence Executive was formed under General Ironside, Commander-in-Chief Home Forces, to organize the defence of Britain. At first these defences focused on the coastline and a series of inland anti-tank 'stop' lines. These were often natural obstacles like rivers or breaks in the land-form like natural scarps that were enhanced with anti-tank obstacles and defended by pillboxes. The defences effectively divided the country up into a series of 'fields' surrounded by 'hedges' of anti-tank obstacles to slow down the advance of enemy troops (Dobinson 1996a).

Much of the coastline of southern England was fortified at this time with the construction of multiple lines of beach defences. This coastline was therefore heavily

defended with obstacles placed on the beaches to impede the progress of enemy soldiers, vehicles or watercraft landing from the sea. Obstacles included lines of scaffolding, barbed wire entanglements and concrete anti-tank blocks or cylinders; often they were deployed in combination with each other.

Anti-tank block/obstacles

The use of concrete obstacles as an impediment to tanks was appreciated before the Second World War however between 1940 and 1941 staggering quantities were made and positioned in a variety of forms and they are probably the most plentiful type of defensive structure still surviving today (Dobinson 1996b, Lowry 1996). Fifty six lines of anti-tank blocks and cubes were plotted during the mapping including lines of cubes associated with the defence line around Wareham (MDO28785). The concrete blocks were between 1.5-2m across and on average spaced with gaps between of 1-2m. In some places more than one line of cubes was identified.

The lines of concrete blocks or cubes run across small stretches of coast vulnerable to ingress by invading forces such as beaches and mouths of small coves with potential access inland (Figure 95). In most cases the blocks were removed soon after the end of the war but in a few places the original lines of blocks were moved or reused as sea defences, their new positions being identified on recent CCO imagery.

Lines of cubes were also located as stop lines within the urban centres. The remains of one stop-line was identified at Poole running from Poole Park northwards along Bird's Hill Road. The stop line continued out of the current mapping project area north of Garland Road, along Sandbourne Road and across the allotments where it joined a large earthen bank and ditched defensive line which ran west to Creekmoor Lake (Figure 93).



Figure 93. Lines of anti tank cubes, Poole

MDO29283. Photograph RAF 541/106GLA/163 Frame 3013 08-MAR-1945 English Heritage
RAF photography

Barbed wire obstructions

Two main forms of barbed wire obstruction were deployed during the war. Barbed wire fences comprised several lengths of barbed wire affixed to posts and were most commonly used at the coast as part of a linear beach defence. Barbed wire entanglements comprised three coils of barbed wire stacked upon each other and fixed by metal picket fencing; this construction was more generally used around defended positions such as pillboxes (Foot 2006).

Barbed wire obstructions were not easily identifiable on the aerial photographs, being visible only as darker lines cutting across the landscape, caused by the longer growth of vegetation and weeds within the entanglements themselves (the barbed wire prohibiting access to grazing animals or other means of maintenance). At 20 sites these darker lines were identified as barbed wire. In some places, particularly in Block 1 such as Bridport Harbour (MDO29613) and Hive Beach, Burton Bradstock (MDO29646) the fencing provided additional lines of beach defence along with anti-tank cubes.

In other places barbed wire was identified encircling gun emplacements, pillboxes and other military installations, presumably to enhance their defences as well as preventing civilians from straying into these potentially dangerous locations.

Beach scaffolding

Also known as Admiralty Scaffolding or Obstacle Z.1, beach scaffolding was widely deployed on beaches in southern England. It comprised parallel lines of upright tubular steel connected by horizontal tubes and braced by diagonal tubes to the rear (Figure 6.34). Initially designed as an obstacle to boats, the sections were preassembled and positioned at the half tide mark. By early 1941 however, tubular steel scaffolding was adopted as an anti-landing or anti-tank barrier and constructed above the high tide mark on particularly vulnerable beaches (Dobinson 1996a). In many places multiple lines of scaffolding were identified during the project at both at the half tide mark and above the high tide mark.

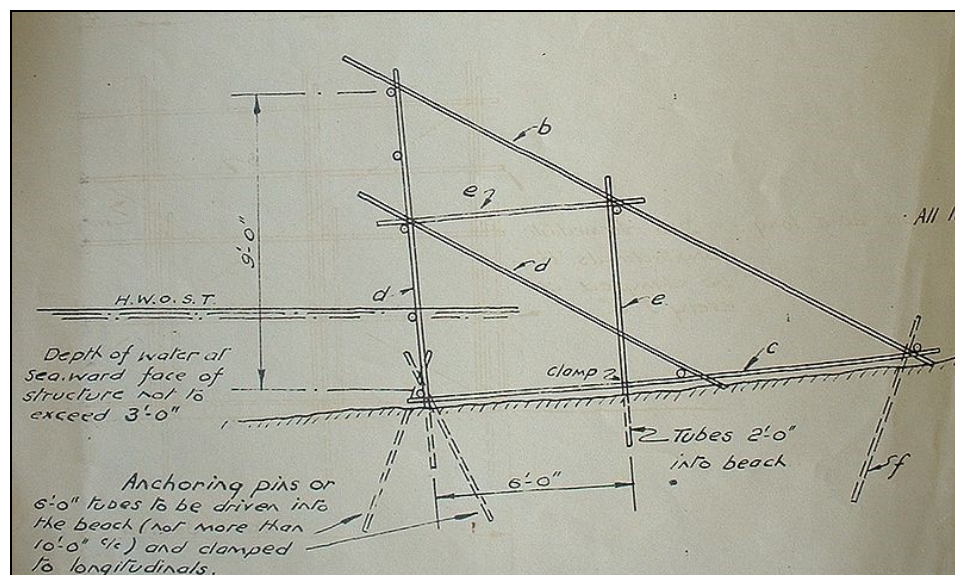


Figure 94. Drawing of beach scaffolding defence, type Z.1, also known as Admiralty Scaffolding.

(HM Government 1940 UK National Archives: WO 199/1618)

Fourteen sections of beach scaffolding were identified, primarily along the coastal strip between Swanage and Hengistbury Head. In addition, a further 18 sites were

more generally indexed as 'Beach Defence' some of which were for less regular lines of upright posts with associated barbed wire entanglement.

An almost continuous line of scaffolding was constructed at the mid to low tide mark along a 6km stretch of beach at Bournemouth. Figure 94 shows the partially submerged scaffolding located outside the groynes. Two short lines of anti tank cubes are also visible cutting off the narrow valley of Durley Chine.



Figure 95. Beach scaffolding and anti tank cubes protecting the beach at Durley Chine, Bournemouth

MDO28587, MDO28586, MDO28599 and MDO28600. Photograph RAF 106G/T16 PT I Frame 7118 30-OCT-1945 English Heritage RAF photography

Minefields

Minefields were integrated into the Second World War anti-invasion defence schemes in order to cover gaps or to reinforce their overall strength. As these minefields were intended to be subsurface structures which were as unobtrusive as possible they are only identifiable from aerial photographs if the sortie was flown either shortly after the mines were buried, or shortly after they were removed at the end of the war.



Figure 96. Possible removed minefield on Hengistbury Head visible as a double line of pits.

MDO28888. Photograph RAF CPE/UK/2370 PART I Frame 5026 20-OCT-1947 English Heritage RAF photography

Only three minefields were recorded in the project area. The small number may have been due to a lack of photographic sorties flown in the critical periods described

in the previous paragraph, or because they were not commonly constructed along the south coast of Dorset; perhaps due to the proximity of civilian populations. The three minefields recorded are visible as parallel lines of small pits presumably left over from the removal of the mines. They are located at Freshwater Beach, Burton Bradstock (MDO29622), Studland (MDO29023) and Hengistbury Head (MDO28888) although the Hengistbury Head pits may equally have served as anti-landing obstacles (Figure 96).

Pillboxes and gun emplacements

In addition to the physical barriers set up on the beaches, numerous pillboxes were constructed all along the south coast. These small fortified structures were constructed at defensive locations right across Britain and by 8th October 1940 14,163 shuttered concrete examples had been built (Dobinson 1996a, 157). Whilst most pillboxes were built in a range of standard types, the term is used to cover a diverse range of features in both size and construction as well as tactical function. In general pill boxes were provided for infantry and artillery defence of strategic positions and were defended with rifle and light machine guns; however there were also pillbox like structures for various other purposes including coastal batteries, light anti-aircraft batteries and searchlights.

Sixty pillboxes, five gun emplacements and one spigot mortar emplacement were identified during the project. Those associated with beach defence were often located in association with other obstruction defences such as barbed wire or anti tank cubes.



Figure 97. Bournemouth Pier, 1945

MDO28659. Photograph RAF 106G/T16 PART 1 Frame 7112 11-OCT-1945 English Heritage RAF photography

Pleasure piers

In addition to the above anti-invasion obstructions, the mid-sections of both Boscome Pier and Bournemouth Pier, Bournemouth were demolished during the war

to prevent enemy landing and use of the pier for the disembarkation of enemy troops. At Bournemouth Pier, a 45m section was removed by the Army Demolition Team and the pier head reconstructed in 1950. The removed midsection is clearly visible on photographs taken in 1945 (Figure 97) along with partially submerged beach scaffolding at the mid-tide line to the west of the pier and a double line of anti-tank cubes at the landward end of the pier.

6.11.2.5 Bomb craters

The 557 bomb craters and groups of bomb craters that were encountered during the project are evidence of the amount of military activity that took place within the project area during the Second World War. The bomb craters encountered were associated with both enemy bombing raids and Allied training, particularly in the vicinity of Studland Heath on the south side of Poole Harbour where numerous small shell holes and larger craters were plotted (MDO29039, MDO28676-9 8 and MDO29043) Figure 97.

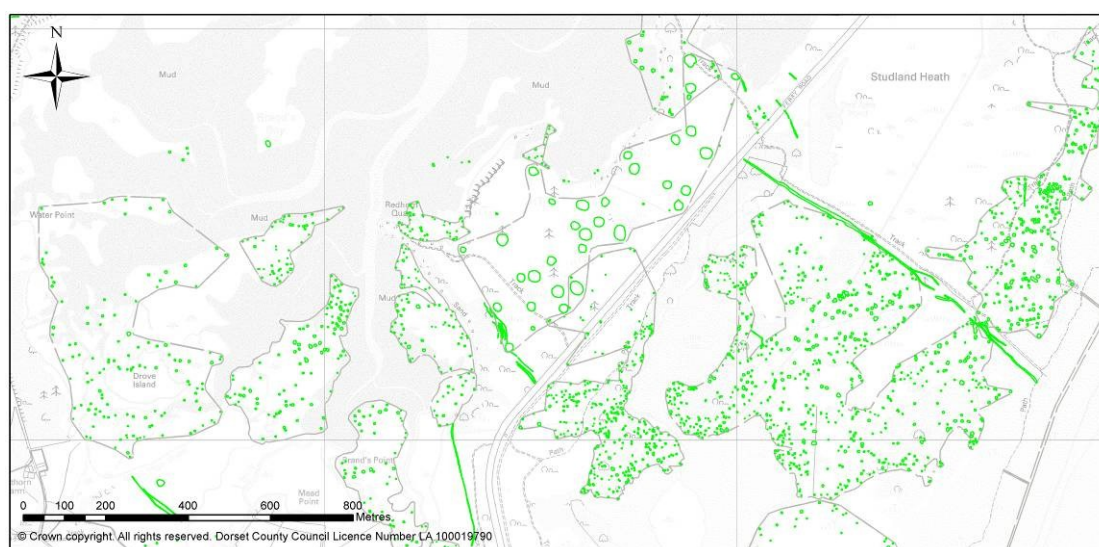


Figure 98. Second World War shell holes and craters on Studland Heath

NMP mapping © English Heritage.

6.11.2.6 Bombing decoys

The bombing of airfields, communications targets, towns and cities was an integral part of Germany's *blitzkrieg* or lightning war. Heavy bombing of the British mainland commenced in 1940 with attacks on airfields and important strategic settlements. Air defences included gun batteries and balloon barrages as well as less conspicuous dummy targets and decoy sites designed to protect specific targets (towns and airfields) by drawing away enemy fire. The decoy sites included day and night dummy airfields (K and Q sites) and diversionary fires (QF and SF (Starfish) sites) designed to simulate night time fires after a successful bombing raid. Other strategic sites such as towns, factories and army and naval establishments were protected with Starfish and simulated urban lighting decoys (QL) (Dobson 1996b).

Two bombing decoys were identified during the project. These included the QF site at Chickerell Hive Point (MDO29731) which was built as part of the N-series of naval decoys to deflect enemy bombing of Portland Harbour. This comprised four decoy sites at Speed Beacon, Littlemore, Wyke Oliver and Fleet. The Fleet decoy was a QL (simulated lighting) and QF/Starfish (diversionary fire) site and its documented grid reference was SY637791 (Dobinson 1996b 116).

The site consists of a number of rectangular features (presumably fuel and water tanks) connected by long linear flare paths and associated buildings and command centres (Figure 99). The northern portion of site was partially mapped during the South Dorset Ridgeway Mapping Project (Royall 2011).

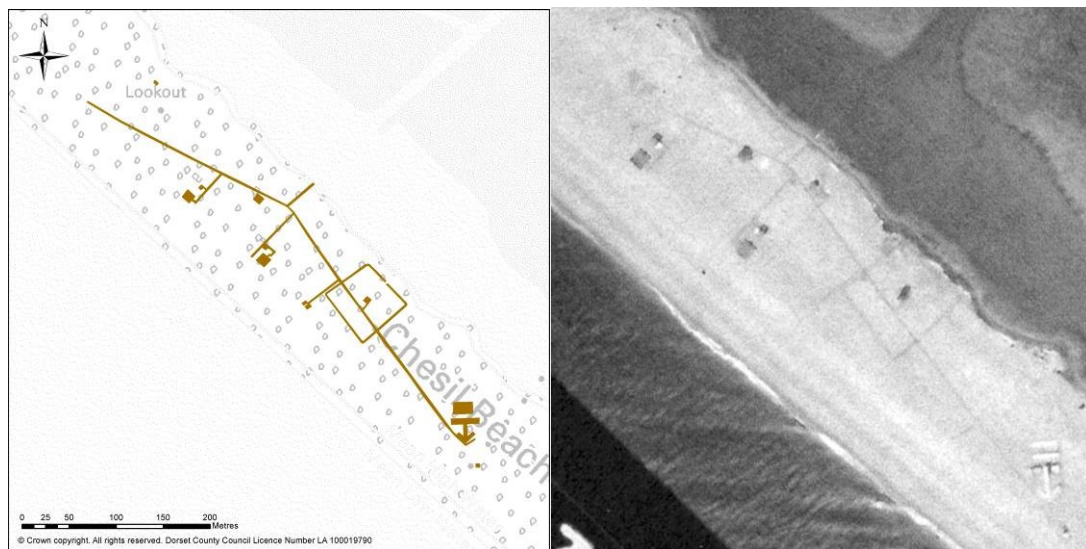


Figure 99. N-Series Fleet bombing decoy, Chickerell Hive Point.

MDO29731. Photograph: RAF AC36 V Frame 8637, 27-APR-1942 English Heritage RAF Photography. NMP mapping © English Heritage.

A second bombing decoy site was constructed at Slepe Moor, Arne (MDO28948). This was also a Naval QF decoy built to deflect enemy bombing from the Royal Naval cordite factory at Holton Heath. A series of rectilinear structures, again presumably fuel tanks, were identified on aerial photographs taken in 1947.

6.11.2.7 Chain Home stations and radar stations

Chain Home was the name given to a ring of early warning radar stations positioned around the British coastline during the Second World War. The system was used for the long range detection of enemy aircraft and was later used in conjunction with a Chain Home Low system which could detect aircraft at lower altitudes. The system comprised a transmitting array, formed of wires strung between two metal towers, up to 110m high. The receiving array was on tall wooden towers with two antennas at right angle to each other (Dobinson 1996d).

The sites of Chain Home stations were identified at Ringstead, Owermoigne (MDO29289, 29293 and 29294), Hengistbury Head (MDO28870, 28876), Worth Matravers (MDO29266) and Cains Folly, Stanton St Gabriel (MDO29556). Additional radar stations were located at Hamworthy, Poole (MDO29525) and Portland (MDO29684).

At Hengistbury Head two sets of tall transmitting array towers were identified 200m apart (visible in the middle ground of Figure 28) with a single pair of receiving array towers 300m to the south east. The western of the receiving towers is visible in the foreground (far left) of Figure 28. The chain home station was part of a much larger military complex on Hengistbury Head which was defended by pillboxes, camouflaged bunkers, road blocks and anti aircraft gun posts (section 6.11.2.9).



Figure 100. Second World War Chain Home station at Worth Matravers.

MDO29266. Photograph: RAF COE/UK/1824 Frame 3244 04-NOV-1946 English Heritage RAF Photography. NMP mapping © English Heritage.

6.11.2.8 Firing ranges and training areas

There has been a long history of military training in Dorset with parts of this coastal stretch being used during the First World War and earlier. A small number of military camps, ranges and traces of practice slit trenching were identified across the study area (particularly in Blocks 2, 3 and 4) as well as fox holes and shell holes. During the project 66 military camps and groups of military buildings were identified as well as 33 areas of slit trenching and five weapons pits.

The military training area of Lulworth Ranges lay in the project area and a number of features associated with it were mapped and recorded. The ranges, which are still active, cover an area of over 2,800 hectares between Wareham and Lulworth and are part of the Armoured Fighting Vehicles Gunnery School based at Lulworth Camp.



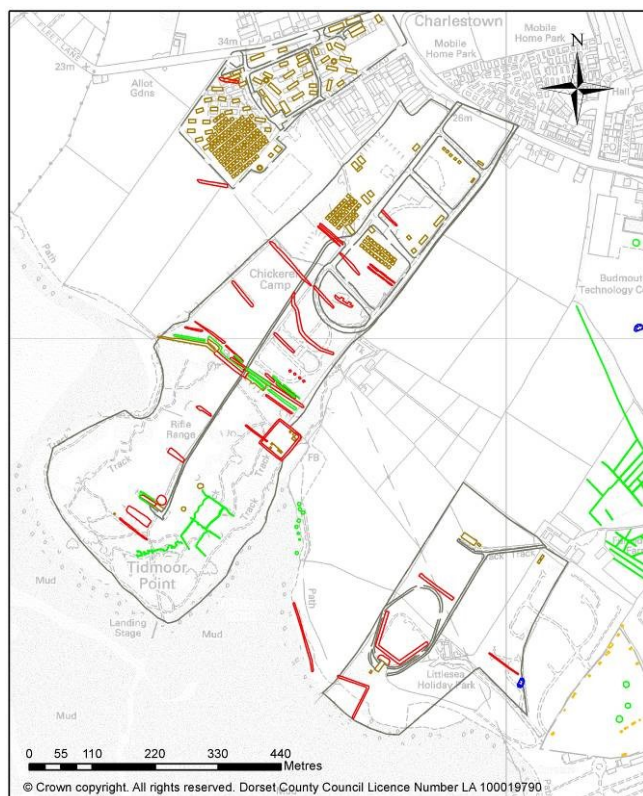
Figure 101. Tank firing range at Swalland Farm, Kimmeridge

MDO29192. Photograph: RAF 106G/LA200 2012 27-MAR-1945 English Heritage RAF Photography.

The sites of two possible tank training ranges were identified at Studland Heath (MDO29038) and Swalland Farm, Kimmeridge (MDO29192). An extensive area of

military features were identified at Swalland Farm including deeply cut 'roadways' with large turning ovals at each end as well as miscellaneous smaller structures including building platforms (Figure 101). The site is comparable to documented tank ranges at Beachy Head (Carpenter et al 2013). The wide 'roadways' being embanked target runs along which moving targets were winched along on rails. The tanks would have been located at set firing points, presumably inland from the range with shells fired out to sea.

A temporary military camp, presumably associated with the training range, lay immediately to the north of the range in the grounds of Sedmore House (MDO29193). Over 100 tents (and cropmarks of sites of removed tents) were identified on aerial photographs taken in 1945.



Additional training areas and camps were identified at Arne (MDO28964) and Chickerell (MDO29864).

At Chickerell the barracks blocks were associated with the Wyke Regis training area and Fleet Rifle Range (see Figures 87 and 102).

Figure 102. First and Second World War firing range at Chickerell.

NMP mapping © English Heritage.

6.11.2.9 Hengistbury Head

It has already been noted that during the Second World War, Hengistbury Head became the site of an important Chain Home radar station (Section 6.11.2.7). The military effectively took over the entire peninsula and features associated with a complex array of military activities were identified on aerial photographs taken during and immediately after the war. As well as the arrays of radar masts, pylons and ancillary roads and buildings directly associated with the radar station, extensive defensive structures were constructed including road blocks, anti-aircraft gun posts, slit trenches and barbed wire obstructions.

Other features identified included a group of large circular mounds protected with camouflage netting, possibly bunkers or air-raid shelters as well a shield cut into the ground surface, possibly an unfinished regimental emblem (Figure 103). The double line of pits to the east of the emblem are possibly the site of a removed mine field or anti-aircraft obstructions.



Figure 103. Second World War regimental emblem carved into the ground surface at Hengistbury Head

MDO8944. Photograph: RAF 106G/T16 Part I Frame 7132 30-OCT-1945 English Heritage RAF Photography.

6.11.3 Cold War sites

The Royal Observer Corp (ROC) was a civil defence organisation that operated in the UK between 1925 and 1995. It was composed mainly of part-time volunteers, whose primary task was the detection, identification, tracking and reporting of aircraft over Britain. From 1955 the ROC were given an additional task in the form of defending against the effects of nuclear weapons by detecting and reporting nuclear explosions and associated radioactive fall-out. The ROC continued until the early 1990s when the end of the Cold War substantially reduced the threat of nuclear attack (Dobinson, 2000).

The ROC monitoring posts were bomb-proof nuclear protected buildings, usually semi-sunk blockhouse buildings of standard layout and providing accommodation, life support systems, decontamination facilities and a communications centre. These underground bunkers were often hidden away in the corners of fields.

One monitoring post was recorded in the project area near Ridge, Stoborough Green (MDO28799) close to where a small square structure was identified on aerial photographs taken in 1945. The 1945 site clearly predates the Cold War but its close proximity to the later observation post led the interpreter to suggest that the 1945 features possibly had a military origin and that the site was later replaced by the monitoring post. A possible structure is visible on Google Earth images taken in 2005

6.12 NMP results: Undated sites

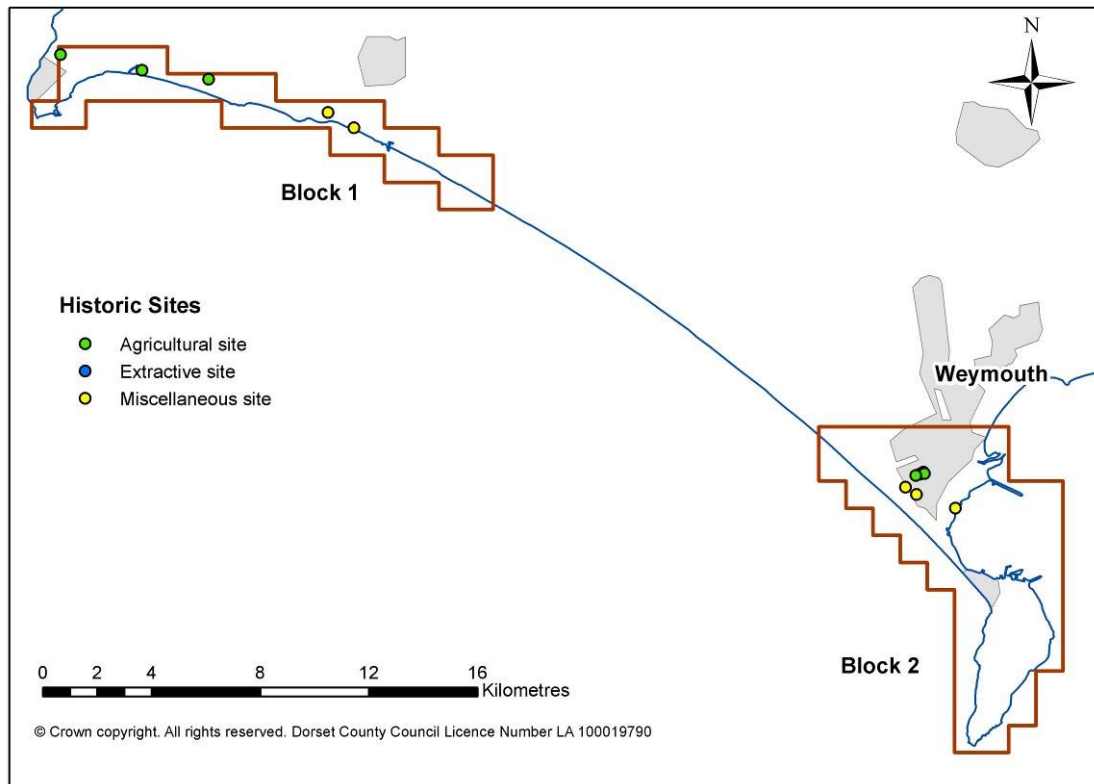


Figure 104. Distribution of Undated sites, Blocks 1 and 2 (west)

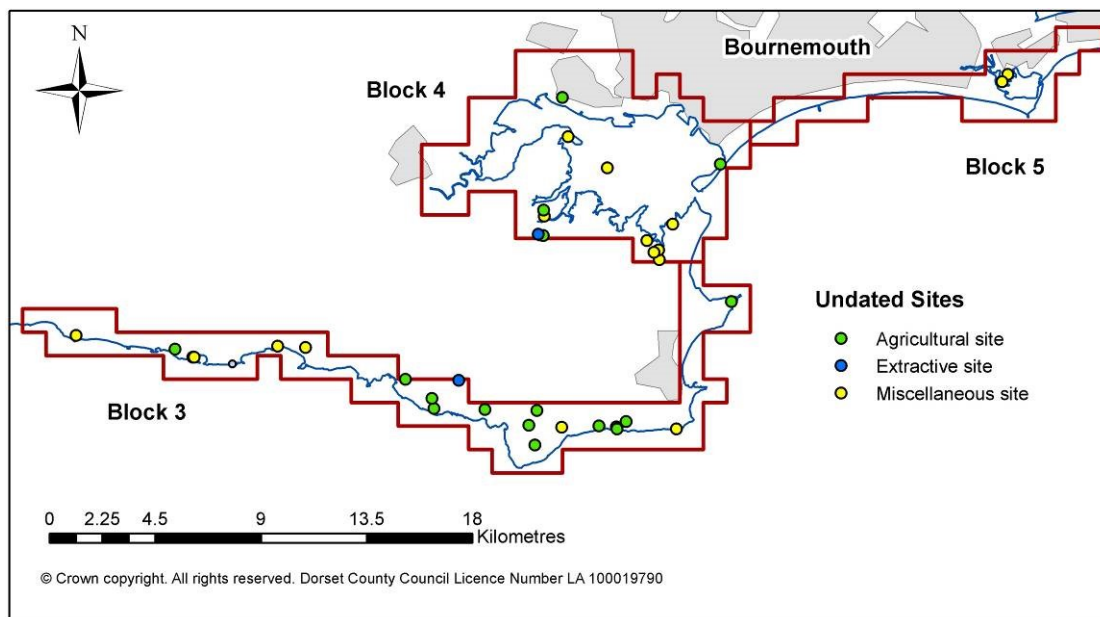


Figure 105. Distribution of Undated sites, Blocks 3, 4 and 5 (east)

Fifty sites were listed in the project database as of uncertain date; these are sites to which a more specific prehistoric or historic date could not be allotted with confidence. They include sites of ambiguous function such as mounds and ditches as well as site types that could range in date from the prehistoric through to the historic periods such as field boundaries and field systems, trackways, and enclosures. Many of these sites could well be of prehistoric origin. Of the 50 sites, the majority (80%) were new to the Dorset HBSMR.

Site Type	No: Sites
Bank (earthwork)	6
Boundary Bank	2
Ditch	2
Enclosure	10
Extractive Pit, Pit	2
Field Boundary. Field System	16
Mound	4
Rock Cut Chamber	1
Trackway	7
Total	50

Table 11 Undated site types

Sites of particular interest include:

The Studland Circles. Two groups of intriguing circles are located on the Studland Peninsula. The largest group lies to the east of Redhorn Quay and Jerry’s Point where traces of 36 circles were identified on the photographs (Figure 106). The enclosures, which are between 12m and 42m across, appear to overlap each other in places and some were seen as only semi-circular banks. A recent survey carried out by the Poole Harbour Heritage Project (PHHP) identified over 70 circles in the Redhorn Quay group (PHHP 2014). A second smaller group lies to the south at Greenlands Farm (Figure 107).

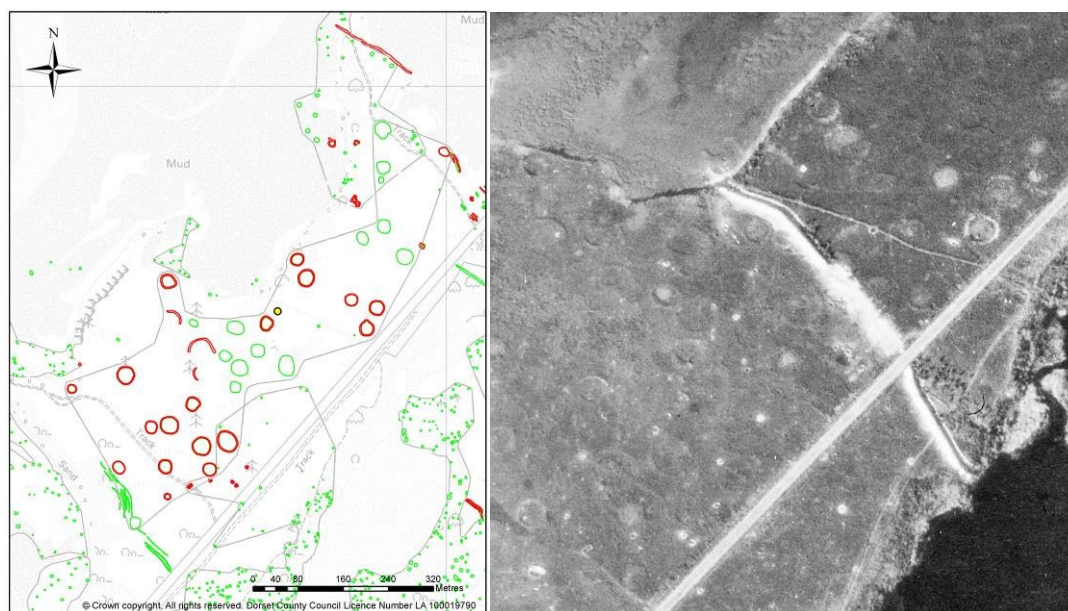


Figure 106. Studland Circles. Undated enclosures at Redhorn Quay.

MWX827. Photograph RAF CPE/UK/1821 Frame 6385 04-NOV-1946 English Heritage RAF Photography. NMP mapping © English Heritage.

The enclosures were first recognised 1860 when they were considered to be prehistoric hut circles. The date and function of the circles still remains uncertain despite survey and excavation. It has previously been suggested that they are

Roman or medieval salt pans (Legg 1987) although this has been questioned due the permeability of the underlying bedrock (West 2014e). Another theory is that they were weathering pots for seaweed dating to the post medieval period (Henderson 2011). Excavation work carried out at one of the circles in 2009 showed that the circle had been cut into wind-blown sand which may have been deposited since 1500AD perhaps suggesting a post medieval date for the features (PHHP 2014).



Figure 107. Studland Circles east of Greenland.

MDO7918. Photograph RAF 39/3812 Frame 0043 20-OCT-1971 English Heritage RAF Photography.

Sandbanks 'Trackway'. A double linear feature was observed on aerial photographs dating to 1947, running for over 650m within the intertidal zone on the Poole Harbour side of the Sandbanks sand spit. The feature runs alongside the sand spit and was interpreted as a trackway or trackways of uncertain date (Figure 108).

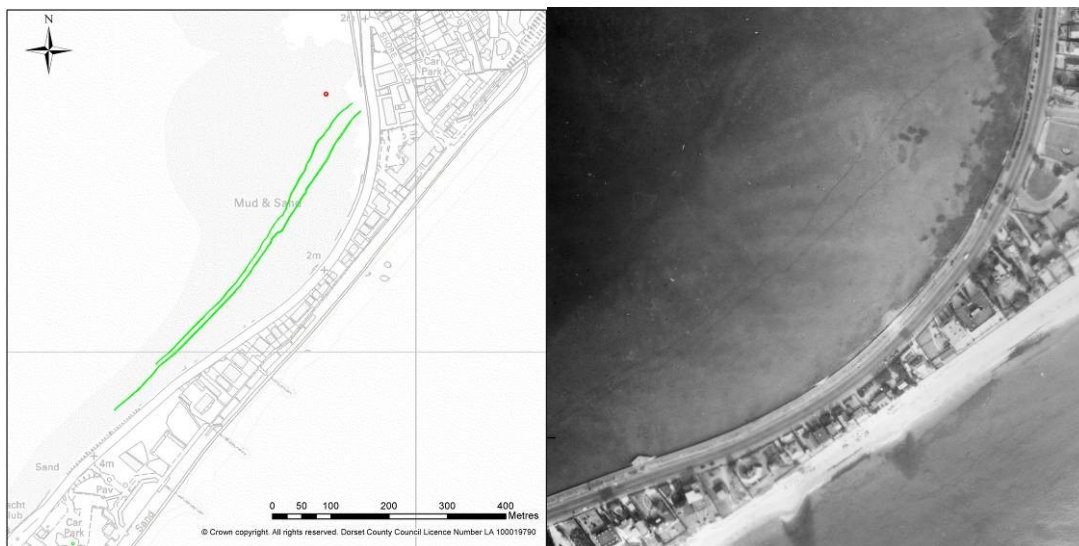


Figure 108. Undated linear feature in Poole Harbour, Sandbanks.

MDO28675. Photograph RAF CPE/UK/2284 Part III Frame 5120 30-SEP-1947 English Heritage RAF Photography. NMP mapping © English Heritage.

White Nothe, Chaldon. At White Nothe, a massive ditch with an associated bank has been previously noted, effectively cutting off the small headland. Two causeways are visible on the aerial photographs crossing the segmented earthwork (Figure 109) and the massive nature of the possible 'ramparts' is suggestive of a defensive function. If the linear earthwork is of a defensive nature it could be of some considerable antiquity and potentially of prehistoric origin; it has however been previously suggested to be associated with post medieval quarrying (MWX518).



Figure 109. Undated linear earthwork across the headland of White Nothe, Chaldon Herring

MWX518 and MDO29331.
Photograph: RAF 541/402
Frame 3016 18-NOV-1949
English Heritage RAF
Photography.

Rock Cut Chamber, Bacon Hole, West Lulworth. A small rectangular rock cut feature was identified on the rocky reef foreshore above the high-tide mark on CCO vertical photographs taken in 2008 and 2010. The feature is less than 2m across and may be associated with post medieval quarrying or be of natural origin.

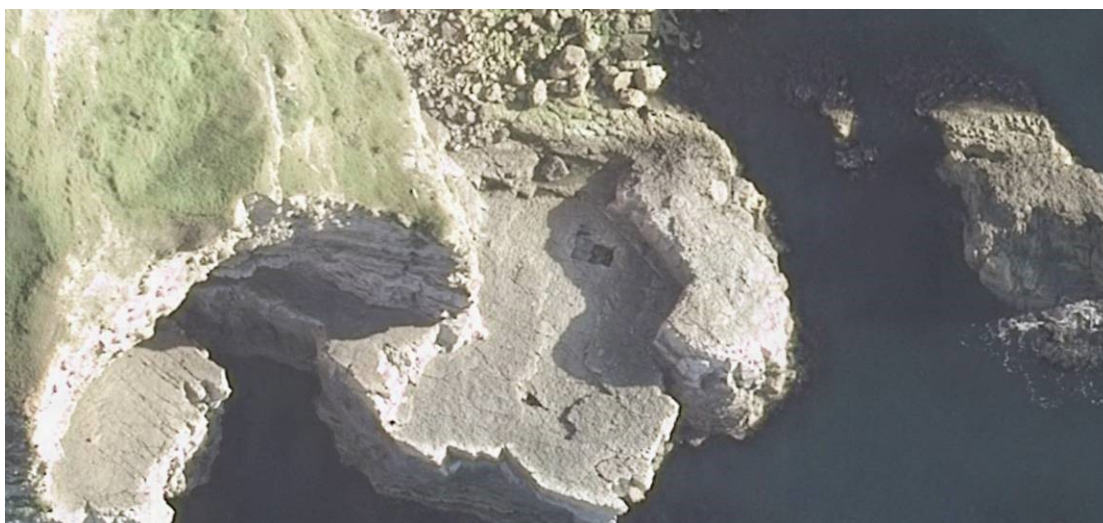


Figure 110. Rock Cut Chamber, Bacon Hole, West Lulworth

MDO29481: Photograph: SY8379ne_20080624.ecw courtesy of the Channel Coastal Observatory

Conclusions

The NMP mapping of the South Dorset coast identified 1374 monuments of which 1308 (75%) were previously unrecognised or unrecorded in the Dorset HBSMR. The project mapped a wide range of site types from all periods ranging from the Bronze Age to the mid twentieth century and demonstrated both the great complexity and intensity of use of the landscape within the project area.

Of the 1734 sites recorded during the mapping project only 640 (37%) were still extant or partially extant earthworks and 244 (14%) were extant or partially extant structures. 850 (49%) had been completely levelled or demolished and of these 5.36% were visible or partially visible as cropmarks on the aerial photographs. In this respect the project fulfilled its aim of improving knowledge of the archaeological resource, by providing a fuller awareness of the range and extent of archaeological remains within the project area.

The enhanced awareness of the archaeological resource will facilitate management of the area's historic environment on a site specific as well as a strategic level. By looking in detail at the areas of cropmark sites the NMP mapping will help define those parts of the Dorset landscape most sensitive to threat by ploughing or urban expansion

The main outcomes of the NMP mapping and recommendations for further survey and research are set out below.

6.13 Outcomes

Whilst the many of the sites recorded during the mapping project were extractive features and cultivation remains dating to the historic periods, a small yet significant number of prehistoric or Romano-British sites were identified. The majority of sites recorded related to the use of this stretch of Dorset by the military during the two world wars and the anti-invasion measures of the Second World War. The mapping results have therefore greatly improved our understanding of the nature and extent of human activity along the Dorset coast for all periods.

Although no sites of Neolithic date were identified a possible Late Neolithic/Early Bronze Age hengiform monument was recorded for the first time during the project as well as 17 new Bronze Age round barrows. Whilst only small numbers of later prehistoric monuments were recognised (including four Iron Age, 19 Iron Age/Romano British and 14 prehistoric or Roman sites), the majority (62%) of site attributed to these period were new to the Dorset HER.

Like neighbouring Hampshire and Southern England in general, the early medieval period is poorly understood in Dorset. Only one site recorded during this project was attributed to this period; that of the already known early medieval defences at Wareham.

Sites relating to the later medieval period were also sparse with only 54 identified during the mapping; however, of these, 43% were new to the Dorset HBSMR. All new sites were agricultural features such as field boundaries, field systems, cultivation marks and trackways.

Almost a third of all sites recorded were attributed to the post medieval or early twentieth-century periods. This is a period that has not been the primary focus of archaeological survey and field investigation until fairly recently and therefore a high proportion (513 (93%)) of sites were new to the record. The current project is perhaps one of the first to systematically record post medieval sites within the project area.

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 relating to the anti-invasion defences of this stretch of the Dorset coast being recorded for the first time. Further research into the impact of the Second World War on the Dorset coast using the exhaustive documentary sources from the period may prove invaluable in providing more precise dating and interpretations for some the features plotted.

6.14 Recommendations

- **Continuing aerial reconnaissance.** Specialist aerial reconnaissance has been undertaken over the project area in recent decades and a number of important new sites have been identified from this photography. In addition, a large number of remains were identified from vertical photographs taken by the OS and by the RAF in the 1940s. There consequently remains considerable potential for the discovery of archaeological sites through a continuing programme of aerial reconnaissance particularly during the summer months. The use of NMP mapping during future aerial reconnaissance will also allow much greater efficiency by facilitating better targeting in an area of very dense archaeological remains.
- **Further NMP projects.** The significant numbers of important new sites recorded during the project demonstrate the effectiveness of NMP mapping within Dorset. This is despite there having been a long history of aerial reconnaissance over the county since the 1920s. Further NMP mapping for all parts of the county as yet unmapped would be of enormous value, especially in those areas subject to continued ploughing.
- **Further investigation of sites recorded from aerial photographs.** Although a large number of sites have been recorded from aerial photographs, a relative lack of field work and excavation means that little is known about them. In particular the date and function of many features is unclear. A programme of ground based investigation of a representative sample of the sites recorded by NMP, involving field walking, geophysical survey and limited excavation, would significantly enhance current knowledge of prehistoric, Roman and Saxon rural settlement.
- **Enhanced Designations.** The NMP mapping has significantly added to the numbers of important archaeological monuments within the project area. The extents of previously known sites (such as field systems) have in some cases also been increased. This is an important area of the country in terms of the national archaeological resource and therefore is it strongly recommended that the current designations (in terms of the numbers and extent of scheduled sites) are reviewed at the earliest opportunity.

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Project Archive

The HES project number is HEXQPR146228

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

1. A project file containing the project design, project correspondence and administration.
2. This report held in digital form on the Cornwall County network and copies deposited with EH and DCC
3. The AutoCAD drawings held in digital form on the Cornwall County network and copies deposited with EH and DCC

Appendix 1 Methodology

Sources

Aerial photograph collections

All readily available aerial photographs were consulted during the project. The English Heritage Archive (EHA) formerly part of the National Monuments Record (NMR) in Swindon holds large numbers of aerial photographs of the project area. These include vertical prints taken by the Royal Air Force (RAF) and Ordnance Survey (OS) ranging in date from the 1940s to 1999. The EHA also holds a large collection of oblique prints; including military obliques taken by the Ministry of Defence (MOD) between 1941 and 1950 and a collection of specialist oblique prints, slides and digital images which were taken for archaeological purposes and range in date from the 1960's to the present day. In addition a small number of very earlier oblique images taken in the 1920s and 30s by OGS Crawford are held in the EHA collection

Cambridge University Committee for Aerial Photography (CUCAP) holds an important national collection containing a number of vertical photographs taken for a range of non-archaeological purposes as well as specialist oblique photography resulting from archaeological reconnaissance.

In addition to these two national collections, Dorset County Council (DCC) holds a collection of vertical photographs. Images from several years of flying are held in this collection. The 1997 and 2002 colour images were provided to the project as digital jpegs as were scans of the 1972 greyscale photographs. Prints from the additional flights are housed in the DCC offices and were not available for loan. As the project progressed it was felt that due to time constraints, and the large numbers of photographs already available from the EHA, the additional DCC prints would not be consulted.

In excess of 16,148 aerial photographs were consulted during the project. These consisted of 12,383 vertical photographs, 1,832 specialist oblique photographs and 1,933 military obliques.

The largest collection was that of the EHA, of which 10,224 photographs were consulted. Available photographs consisted of 6,732 vertical prints, 1,559 specialist oblique prints and 1,933 military oblique prints. These included 136 digital images and 1,165 laser prints. A loan arrangement was put in place enabling the consultation of these photographs at Cornwall Council's offices in Truro.

The photographic collection held by CUCAP was available to the project although access was restricted to 100 photographs per loan. Due to problems with the timings of processing loans, only prints covering Blocks 2, 3, 4 and 5 were consulted. These included 128 vertical prints and 273 specialist obliques.

Additional digital photographs available to the project included 1,405 vertical photographs from DCC and 4,118 photographic tiles downloaded from the Channel Coast Observatory (CCO) website. In addition, photographic tiles were provided by EH from the Pan Government Agreement (PGA) many of which may have duplicated DCC and CCO images. Online photographic images from Google Earth and Bing were also accessed via the internet.

Lidar Tiles

3780 lidar tiles were downloaded from the Channel Coast Observatory website as .asc files.

Data sources

Data from the Dorset HBSMR

Data from the Dorset HER (HBSMR) was provided to the project team as a series of Arcview shape files with attached object data

Data from the NRHE

Monument data from the National Record of the Historic Environment (NRHE) AMIE database was provided to the project team for the study area by EH at the start of the project in January 2013. This data included details of all archaeological sites and was provided digitally in a series of PDF files and Arcview shapefiles.

Map Sources

In addition to the current OS MasterMap data which was used as the primary source of control for the rectification and mapping. The historic 1st Edition mapping dating from the late nineteenth century was consulted to further understand the archaeology of the project area and to aid interpretation of specific sites.

Archaeological scope of the project

Plough-levelled features and earthworks. All cropmarks and soilmarks representing buried "negative" features (i.e. ditches and pits), earthworks or stonework of archaeological origin were recorded. All earthwork sites visible on aerial photographs were recorded, whether or not they had previously been surveyed (including those marked on the OS maps), and whether or not they are still extant on the most recent photography.

Buildings and structures. The foundations of buildings and structures which appear as ruined stonework, earthworks, cropmarks, soilmarks or parchmarks were recorded. Standing roofed or unroofed buildings and structures were not recorded unless there was no other adequate map record. In specific archaeological contexts however (e.g. industrial and military complexes and country houses) or when associated with other cropmark and earthwork features, particularly when buildings have been demolished since the photography (even if depicted by the Ordnance Survey), then it may have been appropriate to map them in order to make an association explicit.

Ridge and furrow . All areas of medieval and post medieval ridge and furrow were mapped using a standard convention to indicate the extent and direction of the furrows. The project database included brief comment on preservation and visibility over the area mapped as well as any archaeological assessment.

Water meadows. Areas of extensive water meadows thought to pre-date 1945 were transcribed and recorded. The lines of the main drains and leats were mapped in full, plus a sufficient sample of the minor water courses to give a true feel for the extent and pattern of the whole.

Post medieval field boundaries. All removed field boundaries and field systems were plotted where they were considered to pre-date the OS 1st Edition map (c.1880) and are not already recorded on any other OS map. Where post medieval field boundaries mapped by the OS may be misinterpreted (e.g. within complex areas of archaeological features), these may have been plotted or mentioned in the text record.

Parkland, landscape parks, gardens and country houses. All park and garden landscape features (including deer parks) visible on aerial photographs but not previously recorded by the OS were plotted. Similarly, the former existence of country houses either completely or partially demolished during the period of photography were mapped. If the house is depicted by the OS then it will not be mapped but will be mentioned in the text record. Normally the whole complex of house, garden and park was recorded using a single brief text record.

Industrial features and extraction. The aim of NMP is to provide a rapid, basic level, comprehensive survey of the extent and character of industrial remains in a landscape context. The scope for industrial recording is immense and some data already exists within national databases, local specialist recording groups and literature.

Areas of industrial archaeology were recorded using the appropriate conventions where they can be recognised as pre-dating 1945. Roofed or unroofed buildings, when associated with other mapped features within industrial complexes, may have been recorded as described above.

All extractive features believed to pre-date 1945 were mapped. These included large-scale features such as quarries, pits and mines, as well as small-scale extraction of resources for immediate local use (e.g. minor stone quarries and gravel extraction).

Transport. Major transport features (i.e. disused canals and main railways) are included in the Ordnance Survey sphere of interest and subsequently appear on OS mapping; these were therefore not mapped. Smaller features which are outside the Ordnance Survey sphere of interest were mapped, as were trackways, pathways and roadways considered

Twentieth-century military features. NMP military recording includes First and Second World War as well as Cold War features. The aim of NMP is to provide a rapid, basic level, comprehensive survey of the extent and character of the major military remains of the twentieth century. Military structures (originally designed without a roof) and roofed, or unroofed, military buildings, particularly when associated with other mapped features, were therefore mapped, especially when they have been removed or destroyed. Where an extensive site is already mapped by the OS a minimalist approach for NMP mapping was used.

Normally NMP mapping of military sites aims to be a “snapshot” of the main features of the site in 1945 or 1946. Military structures mapped include outlines of extensive features such as airfield perimeter and runways, camp perimeters as well as significant buildings and earthwork structures, and all ephemeral features such as barbed wire, lines of tank cubes, etc.

Coastal archaeology. The coastal zone comprises inshore waters, the intertidal zone, the seashore and river estuaries and is recognised by EH as underrepresented in the archaeological record (English Heritage 1998, 2.1). In coastal areas covered by NMP features identified within the intertidal zone were depicted using appropriate conventions. Wrecks were mapped using a simple plan outline and minimum textual recording. The last known location of features which move in the inter-tidal zone was recorded where appropriate as was whether features were covered over with mud or sand.

Urban areas. Major conurbations are currently a low priority for NMP projects, as such elements of the urban landscape (e.g. factories, housing, transport termini), and particularly twentieth century development, were only mapped in exceptional cases,

for example where there is a direct association with features being mapped outside the urban area. In areas built up in the twentieth century, historic aerial photographs (most are from the 1940s onwards) may record archaeological features, or aspects of the landscape not recorded on historic maps. All archaeological features visible on aerial photographs of the pre-urban landscape were mapped and recorded.

Natural features. Geological and geomorphological features visible on aerial photographs were not generally mapped. In exceptional circumstances however, they were plotted but only if their presence helped to define the limits of an archaeological site or if it was considered likely that an archaeological interpretation may have already been (or in future be) made in error, in which case the true origin of the features was discussed within the project database.

Transcription

The results of the mapping were produced entirely in digital format using AutoCAD.

Information was derived from the photographs and lidar available in the collections identified above.

1. Oblique and vertical photographs were scanned.
2. Digital transformations of the archaeological features visible on the photographs were produced using AERIAL (Version 5.29). Digital copies of current OS 1:2500 MasterMap were used for control information and as a base for mapping in AutoCAD (Version Map3D 2010). All digital transformations will therefore be within a level of accuracy within 5m to true ground position, but typically less than 2.5m to the base map. Where necessary digital terrain models (DTM) were used to aid more accurate rectification of the photographs.
3. The rectified images were imported into the relevant AutoCAD drawings.
4. Archaeological features were digitally transcribed in AutoCAD according to a nationally agreed layer structure and using agreed line and colour conventions as specified by Aerial Survey and Investigation (EH 2010b).
5. Polygons were drawn around each separate monument to define its extent. Object data was attached to the monument polygons and archaeological features in AutoCAD in a table called RECORD. This recorded the Unique Identifier numbers (UID) for records within the AMIE and HCC AHBR databases.
6. Map Note Sheets (MNS) were maintained for each OS quarter sheet within the survey area. MNS record the progress of each sheet and the sources used.
7. Quality assurance checks were carried out on selected map sheets to ensure that all sheets were completed to NMP standards.

Data processing

Project database

Data for all features mapped during the project was input into the Dorset HBSMR v4 database. The database automatically generated unique Project UID numbers (Monument Prefix MDO) and contained fields enabling monument indexing to be carried out to EHA and ALGAO standards. Appropriate data was entered into this database for each archaeological feature mapped (data recorded included summary,

description, photographic references, site type and period, locational information and details of the interpreter).

AutoCAD attached object data

Three object data tables were incorporated into each AutoCAD drawing to enable concordance with the GIS and to facilitate basic analysis of the drawings.

The HBSMR number of all sites, and the AMIE Hob UID of each site (where it existed) was recorded in the first table.

The second table recorded basic interpretative information and contained four fields; period, type, form, and photo number as well as including a comment field.

The third table recorded the date, surveyor, scale of survey, and copyright information.

These tables were attached to all plotted features and the relevant polygon defining the monuments.

Data exchange

The mapped data was provided to DCC as AutoCAD drawings as well as GIS data in the form of Arcinfo .tab files with HBSMR site numbers attached.

Copies of the mapping were provided to EH in AutoCAD format suitable for incorporation in to the EH Corporate GIS.

All data supplied to EH and DCC was to NMP monument recording standards and in line with EH minimum standards for monument recording.

Copies of the Project Design, Final Report and all other relevant project documentation will be deposited with EH. The PDF version of the report will be deposited with Archaeology Data Service (ADS).

Project outcome

A series of AutoCAD drawings was produced showing all archaeological features visible on aerial photographs for each of the two mapping blocks.

The Dorset HBSMR was updated with descriptions of all archaeological sites mapped during the project.

Appendix 2 Quantification Assessment

(The following has been taken from the Project Design)

It is a requirement of NMP projects that the project design should include a quantification of the project area to determine the potential density of archaeological features and the nature of the aerial photography cover. The aim of the assessment is to inform the project timetable and the expected progress per map sheet, in order to minimise the risk of variance from the project timetable.

Geology, soils and topography

Normally geology, soils and topography are important considerations when calculating the timetable for NMP projects, especially when the geology and soils are particularly conducive to cropmark formation. The project area for the SWRCZAS NMP consists largely of a narrow coastal strip, some of which is urban or suburban in character. Where the project area includes inland locations these are characterised by mudflats and creeks (Poole Harbour and Christchurch Harbour). For these reasons geology and soils are not an especially pertinent factor in gauging the likely density of archaeological sites and resulting time scale for this particular project. Topography may have a bearing on progress in Poole Harbour where the extensive mudflats might present problems of map control, especially if the coastline has changed over time.

Monument records

Unfortunately, due to a combination of factors at the time of preparing this project design HER data was only available for Block 2, Portland and Weymouth. For this block there are 804 monument records in the Dorset HBSMR, at an average of 13 records per square kilometre. This is broadly comparable with the monument density encountered during the South East RCZAS, where the average density for the Component One area was 16 monuments per kilometre square. The monument density for the Portland and Weymouth block is likely to be higher than elsewhere due to its long history of military activity. A breakdown of the records by period is presented below.

Period	No of records
Prehistoric	19
Roman	37
Medieval or later	22
Post medieval or later	475
Modern	223
Unknown	28
Total	804

Appendix 2, Table 1. Breakdown of the archaeological sites in the Dorset HER in Block 2 by period.

The record is characterised by a large number of military features from the post medieval period onwards (in addition to Portland Castle, which was in use from the medieval period onwards). There are also numerous features associated with the limestone industry including quarries, lime kilns and related infrastructure. Another notable feature is the recording of 393 wrecks, some of which may be visible on aerial photographs. There is a Bronze Age barrow and an urnfield, a Roman

settlement and cemetery on Portland and a possible villa at Weymouth. Medieval features include a number of strip lynchets and an open field.

Aerial photography

The main photographic collection is held by EH Archive Services in Swindon. The collection consists of specialist oblique photographs taken for archaeological purposes between 1905 and 2010, military obliques taken by the RAF between 1941 and 1968, RAF vertical photography from the 1940s and numerous vertical photographs (usually at 1:10,000 scale) taken by the RAF, Ordnance Survey and a range of commercial organisations from 1950 onwards. EH can also provide digital Pan Government Agency (PGA) imagery as 1km² tiles as well as lidar data. The military obliques and 1940s RAF verticals are particularly important for RCZAS NMP projects because these are the principal sources for recording short-lived Second World War beach defences and other wartime military installations which were abundant along Britain's coastline.

The other main collection is the Cambridge University Collection of Aerial Photographs (CUCAP), which contains a range of vertical and oblique imagery. Other sets of digital imagery, such as Google Earth and BING, will also be accessible. Digital imagery provides uniform coverage across the whole project area, whereas the photographic prints provide greater or lesser coverage.

Block	Obliques	Military obliques	1940s verticals	Post 1940s verticals	Total
1	244	130	88	353	815
2	463	476	330	478	1747
3	470	448	314	535	1767
4	201	201	1,340	1,634	3376
5	161	402	442	569	1,579
Total	1539	1657	2,514	3,569	9,284

Appendix 2, Table 2. Breakdown of the types of EHA photography for the project area (not including photographs in the 1km buffer used in the coversearch).

Block	Obliques	Military obliques	1940s verticals	Post 1940s verticals	Total
1	8	4	3	12	27
2	8	8	6	14	36
3	7	7	5	13	32
4	2	2	16	36	56
5	6	16	18	41	81
Total	6	6	9	13	33

Appendix 2, Table 3. Number of EHA photographs per square kilometre.

Clearly there is more coverage of the area between Poole Harbour and Highcliffe (Blocks 4 and 5), particularly for vertical photography. In fact the number of vertical photographs is above average for typical NMP projects: for the Hampshire Downland

project the average number of vertical photographs per square kilometre was 13.5, as opposed to 22 for the Dorset to Hampshire SWRCZAS. There is however less vertical coverage than for the NMP component 1 of the South East RCZAS project where the average number of photographs per square kilometre was 27 (including an average of 19 1940s verticals).

By contrast the oblique coverage is average (the average number of obliques for component 1 of the SERCZAS was 5 per km sq), especially for Poole Harbour (block 4). This however is offset by the very high numbers of military obliques (unusually for typical projects, these outnumber the specialist obliques).

The pattern of military and specialist oblique photography is shown in Figs Appendix 2.1 and 2.2 below.

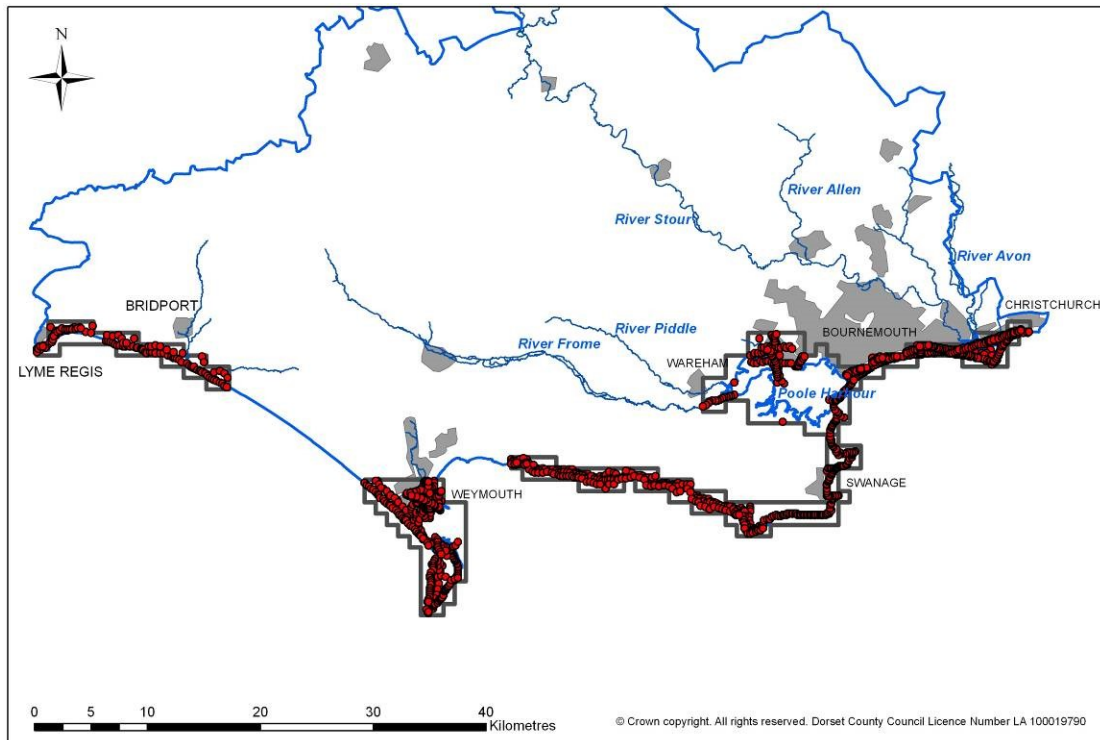


Fig Appendix 2.1. Pattern of military obliques.

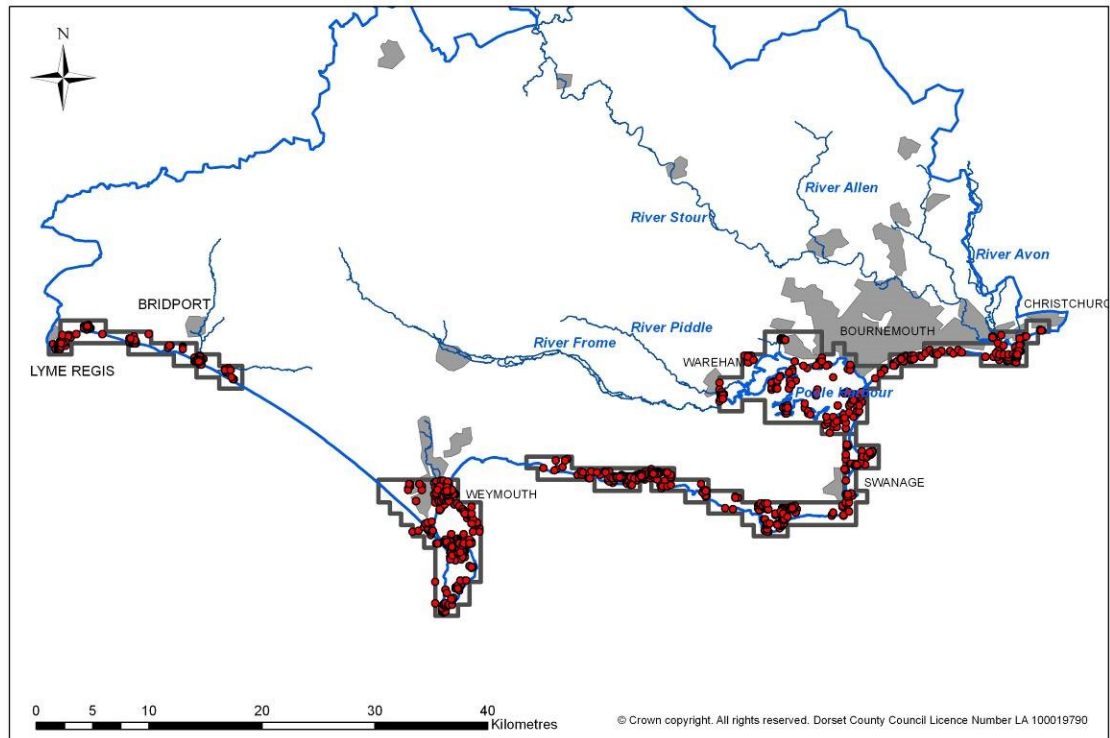


Fig Appendix 2.2. Pattern of specialist obliques.

Whereas the military obliques provide comprehensive coverage of the entire coastline (apart from the interior of Poole Harbour) the specialist obliques are generally more selective, being targeted on specific archaeological or historical features (especially in Block 1).

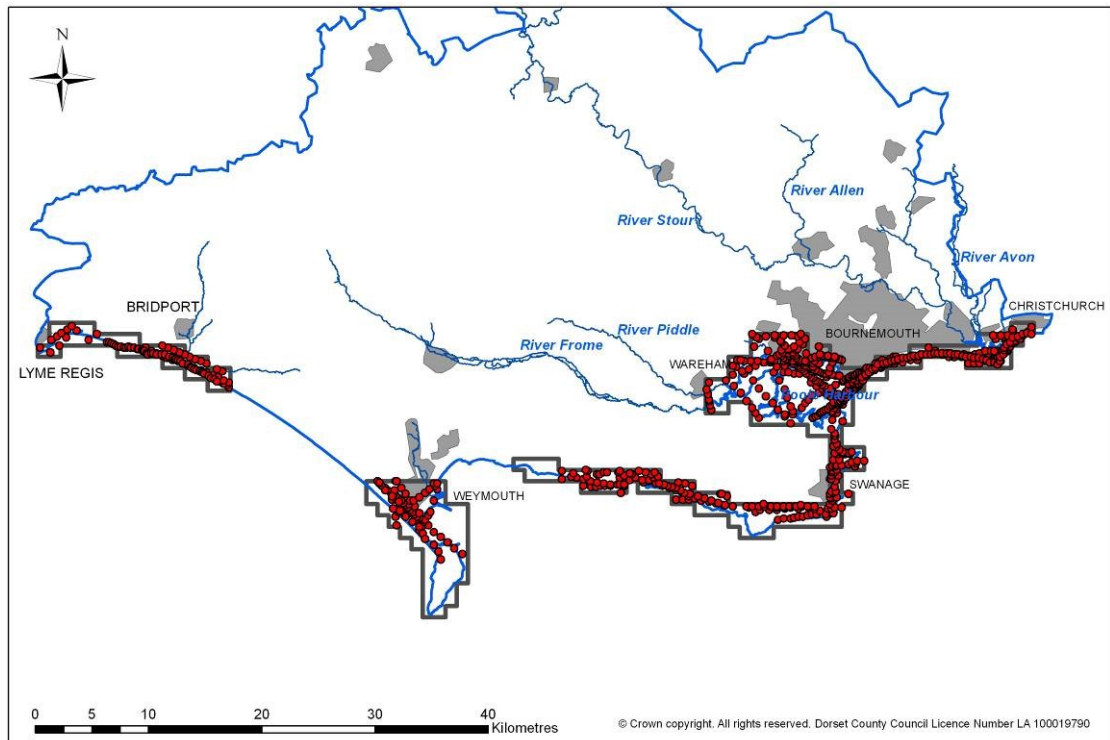


Fig Appendix 2.3. Pattern of aerial photographs taken between 13/07/1940 and 27/3/1945.

It is very likely that a large number of new records for Second World War features will be created during the project. Not only is there comprehensive 1940s RAF vertical coverage of the entire project area, 689 photographs were taken whilst the war was ongoing. Fig Appendix 2.3 shows the pattern of RAF obliques and verticals taken between 1940 and early 1945 and these cover low-lying areas of coast where anti-invasion defences would have been most extensive.

Lidar data

Environment Agency Lidar data is available to the project and the coverage is extensive (Fig Appendix 2.4).

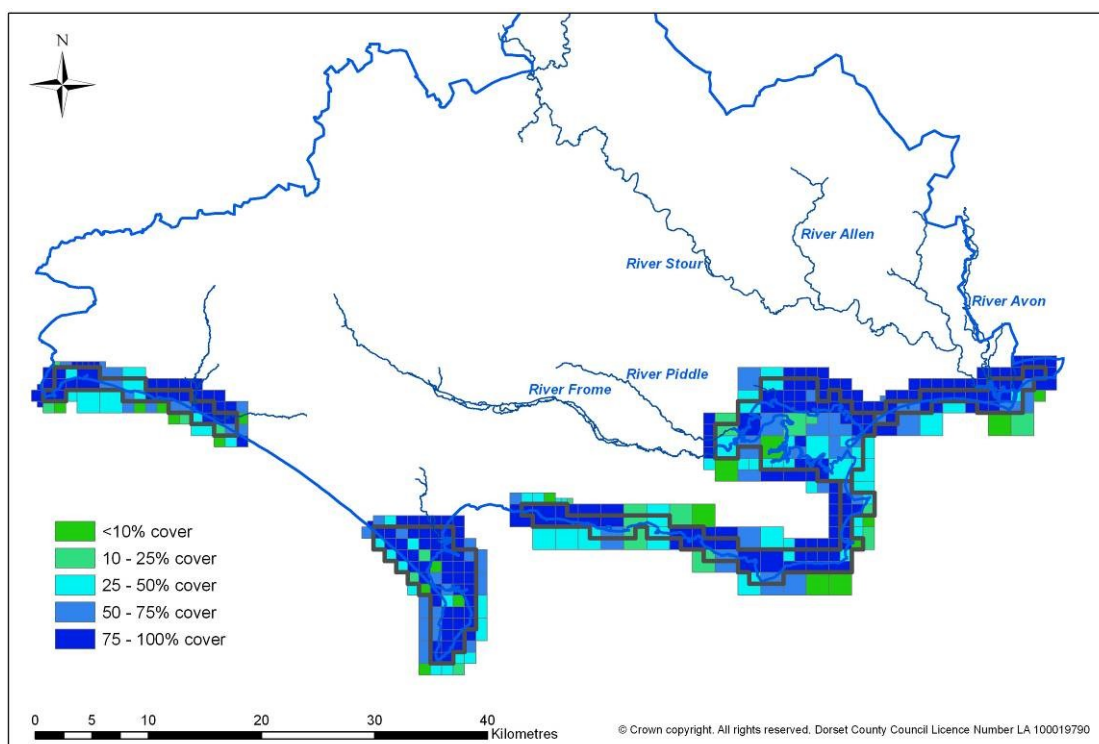


Fig Appendix 2.4. Distribution of Environment Agency lidar data available to the project showing the % of each square kilometre covered by individual lidar tiles.

The entire project area is covered by a total of 2,979 tiles (including those in a 1 – 2km overlapping buffer), of which 80% are at a resolution of 1 or 2m, 78% contain 50% or more coverage and 66% contain 75% or more coverage.

The table below sets out how many lidar tiles are available for each block (excluding those forming the buffer) and percentages of these with a resolution of 1m or more and with more than 75% coverage.

Block	No. of tiles	% 1m+ resolution	% 75+% cover
1	247	60%	64%
2	726	69%	70%
3	555	96%	73%
4	526	87%	70%
5	200	83%	75%
Total	2254	80%	70%

Appendix 2 Table 4. Summary of lidar coverage for each block.

Conclusions

There are above average numbers of HER records for the project area and previous experience of RCZAS NMP projects demonstrates that large numbers of previously unrecorded sites are likely to be identified.

In particular the Isle of Portland has dense concentrations of twentieth century military features and it may be necessary here to undertake less detailed mapping than elsewhere, depending on the rate of progress at the time of mapping Portland.

There are well above average numbers of vertical photographs and military obliques. Given the large numbers of vertical prints it may be necessary to consult only a selection of the post 1950 verticals if progress is slower than anticipated.

Photo coverage for Blocks 5 and 6 is particularly well above average.

Mapping of Poole Harbour (Block 4) may take longer than average because of problems with establishing reliable map control.

There is very extensive lidar coverage of the entire project area.

Taking these factors into consideration the anticipated rate of progress for each of the five blocks is as follows:

Block	Size (km ²)	Days per km ²	Total days
1	30	1	24
2	60	1.13	60
3	67	0.8	54
4	83	1	96
5	25	1.25	31
Total	265	Average = 1	265

Appendix 2 Table 5. Summary of anticipated progress per mapping block.

Appendix 3 Working Blocks

Part of the Dorset coast was mapped for the South Dorset Ridgeway NMP project (Royall 2011). Therefore the project area comprised a coastal and riverine strip covering 265 square kilometres between Lyme Regis in the west and Christchurch Harbour and Highcliffe in the east (Fig Appendix 3.1). Much of the project area fell within the Dorset AONB (Area of Outstanding Natural Beauty), the western part included the Dorset and East Devon Jurassic Coast World Heritage Site (WHS), and the Purbeck Coast including Poole Harbour is a Nature Improvement Area (NIA).

Mapping of complete one kilometre squares is the standard for NMP projects however, for RCZAS projects, mapping may be reduced in pre-war urban areas. Therefore, in these areas, the SW RCZAS NMP component was reduced to the seaward side of a line drawn 100m inland from the mean high water. In the case of the Dorset to Hampshire RCZAS, the mapping area was reduced by 11km sq in the Bournemouth area.

For practical purposes the project area was sub-divided into five working Blocks (Appendix 3, Figure 1). The make up of each Block was constrained by the size of the photo loans available from the EHA (dictated by the number of available photographs).

- Block 1 Lyme Regis to Cogden beach (30km sq).
- Block 2 Weymouth and Portland (60km sq).
- Block 3 Ringstead Bay to Poole Harbour (67km sq).
- Block 4 Poole Harbour (83km sq).
- Block 5 Bournemouth to Highcliffe (25km sq).

Although the Blocks are numbered 1-5 from west to east, the mapping and recording proceeded from east to west at the request of EH.

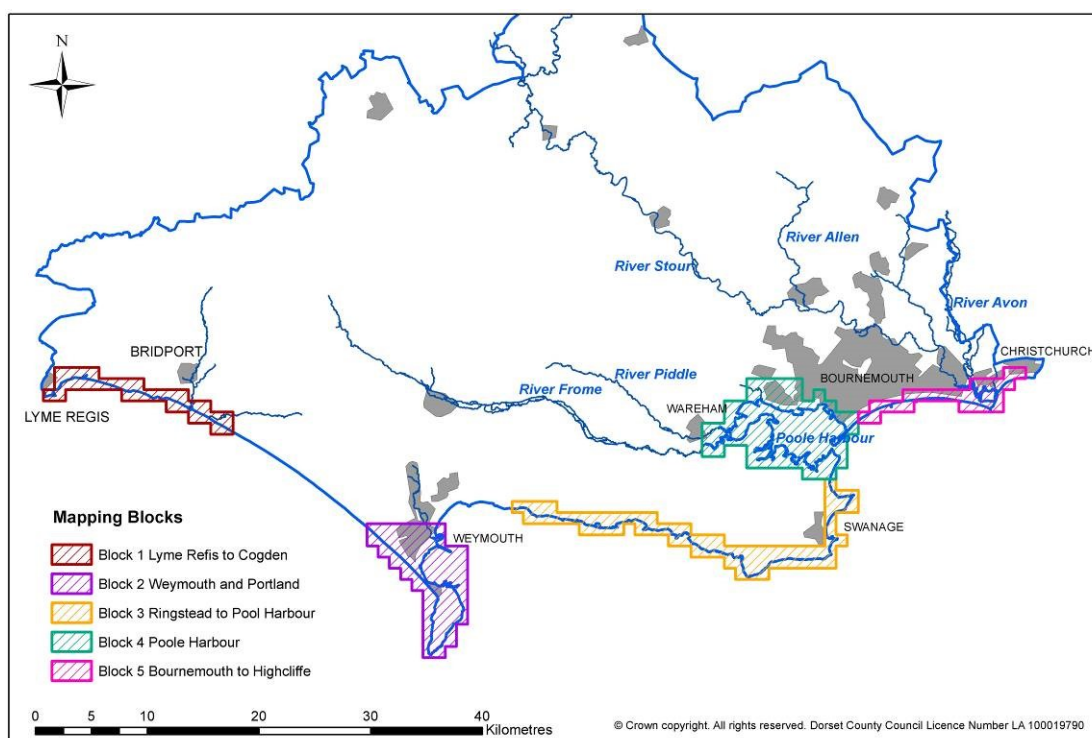


Fig Appendix 3.1. Map of Dorset showing the project area and mapping blocks.

7.3 Block 1. Lyme Regis to Cogden Beach

Block 1 consists of 30km sq between the town of Lyme Regis and Cogden beach, to the southeast of Bridport. All of this area falls within the Dorset AONB and the Dorset and East Devon Jurassic Coast WHS.

The block contains five partial OS 1:10,000 quarter map sheets:

SY39SE	8km sq
SY39SW	4km sq
SY48NE	6km sq
SY49SE	4km sq
SY49SW	8km sq
Total	30km sq

Coversearches carried out by the English Heritage Archive (EHA) team indicate that 441 vertical prints, 244 obliques and 130 military oblique photographs are available for loan. This comes to a total of 815 photographs at an average of 27 per km sq (see Appendix 2).

7.4 Block 2. Weymouth and Portland

Block 2 comprises 60km sq and includes much of the town of Weymouth, Portland Harbour and the whole of the Isle of Portland.

The block contains six partial OS 1:10,000 quarter map sheets:

SY66NE	5km sq
SY67NE	23km sq
SY67NW	9km sq
SY67SE	16km sq
SY77NW	3km sq
SY77SW	4km sq
Total	60km sq

Coversearches carried out by the EHA team indicate that 808 vertical prints, 463 obliques and 476 military oblique photographs are available for loan. This comes to a total of 1,747 photographs at an average of 36 per km sq (see Appendix 2).

7.5 Block 3. Ringstead Bay to Poole Harbour

Block 3 comprises 67km sq and covers the southern and eastern coastline of the Isle of Purbeck, including part of the town of Swanage. The entire block falls within the Dorset AONB and the Jurassic Coast WHS

The block contains ten partial OS 1:10,000 quarter map sheets:

SY78SE	8km sq
SY87NE	5km sq
SY87NW	4km sq
SY88SE	3km sq
SY88SW	5km sq
SY97NE	13km sq

SY97NW	10km sq
SZ07NW	11km sq
SZ08SE	2km sq
SZ08SW	6km sq
Total	67km sq

Coversearches carried out by the EHA team indicate that 849 vertical prints, 470 obliques and 448 military oblique photographs are available for loan. This comes to a total of 1,767 photographs at an average of 32 per km sq (see Appendix 2).

7.6 Block 4. Poole Harbour

Block 4 comprises 83km sq and covers the whole of Poole Harbour. The town of Poole and parts of Wareham and Bournemouth lie within the block.

The block contains one complete OS 1:10,000 quarter map sheet and seven partial map sheets:

SY98NE	23km sq
SY98NW	9km sq
SY99SE	13km sq
SY99SW	1km sq
SZ08NE	2km sq
SZ08NW	25km sq
SZ08SW	3km sq
SZ09SW	7km sq
Total	83km sq

Coversearches carried out by the EHA team indicate that 2,974 vertical prints, 201 obliques and 201 military oblique photographs are available for loan. This comes to a total of 3,376 photographs at an average of 56 per km sq (see Appendix 2).

7.7 Block 5. Bournemouth to Highcliffe

Block 5 comprises 25 full kilometre squares and is largely urban in character, including parts of Southborne, Boscomb, Bournemouth and Christchurch.

The block contains five partial OS 1:10,000 quarter map sheets:

SZ08NE	2km sq
SZ09SE	3km sq
SZ19SE	13km sq
SZ19SW	6km sq
SZ29SW	1km sq
Total	25km sq

Coversearches carried out by the EHA team indicate that 1,011 vertical prints, 161 obliques and 402 military oblique photographs are available for loan. This comes to a total of 1,574 photographs at an average of 81 per km sq (see Appendix 2).