

# The Archaeology of Norfolk's Coastal Zone

Results of the National Mapping Programme



English Heritage Project No: 2913

James Albone, Sarah Massey, Sophie Tremlett

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A report for English Heritage  
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## Abbreviations

|        |  |
|--------|--|
| AA     | anti-aircraft  |
| AFV    | Armoured Fighting Vehicle                                  |
| ARP    | Air Raid Precautions                                       |
| BHQ    | Battle Headquarters  |
| CASL   | coast artillery searchlight                                |
| CD/CHL | Coast Defence/Chain Home Low                               |
| CH     | Chain Home   |
| CHEL   | Chain Home Extra Low                                       |
| CHER   | Cambridgeshire Historic Environment Record                 |
| CHL    | Chain Home Low   |
| CUCAP  | Cambridge University Committee for Aerial Photography      |
| D/F    | Direction Finding  |
| EH     | English Heritage   |
| GCI    | Ground Controlled Interception                             |
| GDA    | Gun Defended Area  |
| GOR    | Gun Operations Room  |
| HAA    | heavy anti-aircraft [gun or battery, etc.]                 |
| LAA    | light anti-aircraft [gun or battery, etc.]                 |
| NAPL   | Norfolk Air Photo Library                                  |
| NAU    | Norfolk Archaeological Unit [now NAU Archaeology]          |
| NCC    | Norfolk County Council                                     |
| NHER   | Norfolk Historic Environment Record [formerly Norfolk SMR] |
| NLA    | Norfolk Landscape Archaeology                              |
| NMMP   | Norfolk Monuments Management Project                       |
| NMR    | National Monuments Record                                  |
| NRO    | Norfolk Record Office                                      |
| PAD    | Passive Air Defence  |
| PoW    | Prisoner of War  |
| PPI    | Plan Position Indicator                                    |
| RCZAS  | Rapid Coastal Zone Assessment Survey                       |
| ROC    | Royal Observer Corps                                       |
| R/T    | radio telephony  |
| SCC    | Suffolk County Council                                     |
| SOE    | Special Operations Executive                               |
| SSMR   | Suffolk Sites and Monuments Record                         |
| UEA    | University of East Anglia                                  |
| VA     | Vulnerable Area  |
| VP     | Vulnerable Point   |
| W/T    | wireless telegraphy  |



## Mapping Conventions

| Convention  | Layer                        |  |
|---|------------------------------|--|
|  | Ditch                        | Used for drawing all negative features seen as cropmarks or earthworks, <i>e.g.</i> ditches and pits                   |
|  | Bank                         | Used for drawing all positive features, whether upstanding earthworks or levelled features, <i>e.g.</i> banks or roads |
|  | Stonework                    | Used for concrete or masonry structures, <i>e.g.</i> pillboxes and exposed walls                                       |
|  | Structure                    | Used for other structures, <i>e.g.</i> wooden buildings and barbed wire defences                                       |
|  | Ridge and furrow (earthwork) | Used for earthwork ridge and furrow  |
|  | Ridge and furrow (levelled)  | Used for levelled ridge and furrow   |
|  | Inter-tidal structure        | Used for inter-tidal structures, <i>e.g.</i> wooden posts, fish traps and wrecks (for illustration only)               |

As well as these mapping conventions, and for the sake of clarity, it has been necessary to use additional colours on some illustrations. Where this is the case, these are explained in the key or caption to the relevant illustration.

## Acknowledgements

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The project was carried out in collaboration with Cambridge University's Unit for Landscape Modelling (ULM), their contribution being the loan of material from their Air Photo Library.

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# Summary

The National Mapping Programme (NMP) project covering Norfolk's Coastal Zone has made an extremely significant contribution to the study of the historic environment of this ever-changing landscape. It has led to the creation of 3,354 new 'sites' on Norfolk's Historic Environment Record (NHER) database, a substantial proportion of which are new discoveries. This represents a 9% increase to the NHER as a whole, and a staggering 69% increase in known sites within the study area. A further 915 existing NHER records have been amended. It has also resulted in the formation of an archaeological map covering 855 sq km. This report represents a first attempt to create a more synthetic narrative for this considerable body of data.

The NMP of the Coastal Zone project was carried out between 2001 and 2006, and sought to map, interpret and record all archaeological features visible on the consulted aerial photographs, whether earthworks, cropmarks or structures. The project was undertaken by Norfolk Landscape Archaeology (NLA), part of Norfolk County Council's Museums and Archaeology Service, and was funded by English Heritage under the Archaeology Commissions Programme (now the Historic Environment Enabling Programme).

The project has identified, and enhanced our knowledge of, a wide variety of sites ranging in date from the Neolithic to World War Two. Highlights have included the mapping of numerous prehistoric ceremonial and funerary sites, including Neolithic causewayed enclosures, extensive Bronze Age barrow cemeteries, and probable examples of Iron Age square barrows. For the Iron Age and Roman period extensive swathes of field systems, trackways and enclosures, all visible as cropmarks, have been mapped across vast areas in the west and east of the county. For later periods, the results of the project are overwhelmingly dominated by 20th-century military archaeology and the dense network of defences which made up Norfolk's 'Coastal Crust' during World War Two.

It is hoped that in the future the NMP data will be utilised in more detailed studies of specific geographic areas, site-types or periods, where it can be integrated further with existing datasets, or can inform new investigations using other methods of inquiry. Future resources might also be invested in the dissemination of NMP data, both via traditional means or digitally. Notwithstanding this need for further work, already many of the NMP's records can be accessed via the online version of the NHER 'Norfolk Heritage Explorer', at [www.heritage.norfolk.gov.uk](http://www.heritage.norfolk.gov.uk).

# 1 Introduction

## 1.1 Project Background

With the publication of England's Coastal Heritage in 1997 (Fulford et al.), English Heritage set out a Coastal Policy, the implementation of which was considered to be of national strategic importance. The mapping and recording of the archaeology of the Coastal Zone was (and is still) regarded as a priority for the development of long-term coastal management plans. The need to assess the range, extent and condition of the coastal archaeological resource was recognised, especially in relation to its vulnerability and the threat posed by potential coastal change and management strategies. To address these issues English Heritage initiated a series of Rapid Coastal Zone Assessment Surveys (RCZAS) in areas considered to be at particular risk from coastal erosion and change, in Norfolk, Suffolk, Essex and North Kent. These projects have investigated the shores, estuaries and coastal hinterland using a systematic and multi-disciplinary approach, combining the study of aerial photographs, research using historic map and documentary sources, and rapid ground-based survey.

In 1999–2000 a one-year National Mapping Programme (NMP) pilot study was undertaken for the Norfolk and Suffolk RCZAS. Areas were selected along the Norfolk and Suffolk coast intended to target areas representative of the changing coastline and estuaries, and to provide information on the time required to map different coastal environments (Loader & Murphy 1999). On the completion of this pilot study it was decided that the Norfolk coast should be mapped separately as part of a larger countywide NMP project (Allen 2000). The mapping of the remaining coast remained a priority and it was intended that the results from the area that had been defined as the Coastal Zone would feed directly into the field survey phase of the RCZAS.

## 1.2 Study Area

The Norfolk NMP Coastal Zone comprises fifty Ordnance Survey 1:10,000 quarter sheets, of which approximately 855 sq km is land within Norfolk (Fig. 1.1). (They include TF73NW, which was not originally part of the NMP Coastal Zone but was mapped out of sequence as it covers the parish of Sedgeford, which is subject to a major programme of archaeological research. As it lies adjacent to the Coastal Zone proper, it is included in the results discussed here.) The area covers the inter-tidal zone, dune systems, cliffs, saltmarsh and a substantial portion of coastal hinterland. The breadth of this zone allowed for the greater part of the estuaries to be included in the study area, but also takes in large parts of former coastline, i.e. that pre-dating medieval and post medieval reclamation. The vast former estuarine areas that now constitute the Broads are being dealt with separately, in a different phase of mapping

and report writing (Massey et al. 2006). The inter-tidal area of Breydon Water, into which the Broads discharge, is included within the Coastal Zone.

The Coastal Zone mapping incorporates most of two pilot areas studied by Suffolk County Council (SCC) as part of the Norfolk and Suffolk RCZAS pilot project. The northern pilot area stretched from Hunstanton to Burnham Market, encompassing nearly 63 sq km. The southwestern area was smaller, and focused on the lower reaches and estuary of the River Babingley. The eastern portion of this area lies outside what was subsequently defined as the Coastal Zone, but the results of the pilot study have been incorporated into this report in their entirety.

### **1.3 The Norfolk and Suffolk RCZAS**

The Norfolk and Suffolk RCZAS was conceived as being a three-stage multi-disciplinary project. The first phase was a desk-based assessment of all the available historical documentary and cartographic sources for the Norfolk and Suffolk coasts, undertaken by Ivan Ringwood of the University of East Anglia (UEA) (Ringwood n.d.). The second phase was the systematic consultation of aerial photographic sources, the methodology for which is outlined below (Section 1.4). The Suffolk Coastal NMP (English Heritage Project No. 2912MAIN) was undertaken by SCC between April 2001 and March 2004 (Hegarty & Newsome 2005). The third phase of the RCZAS was a rapid field-based survey of the inter-tidal zone, marshes and cliffs. The Suffolk field survey took place between May 2002 and March 2003; in Norfolk it was undertaken by Norfolk Archaeological Unit (NAU) between May and December 2004 (Robertson et al. 2005). It was intended that the NMP mapping for Norfolk would be completed and available for use by the field team by the time the ground survey took place. Due to changes to the timetable of both projects this was not possible for all areas of the coast. (See Section 12.7 for details and for a comparison of the two survey methods.)

### **1.4 Summary of Norfolk NMP Methodology**

The Norfolk coastal mapping was undertaken using the pre-existing methodology of the NMP, a national initiative funded and run by English Heritage. The aims of the NMP are to 'enhance our understanding about human settlement, by providing primary information and syntheses for all archaeological sites and landscapes (visible on aerial photographs) from Neolithic period to the twentieth century' (Bewley 2001, 78). Ultimately, the Norfolk NMP aims to map, record and collate all archaeological sites in the county visible on the available aerial photographs, at a scale of 1:10,000. The resulting maps and records will be stored in, and accessed via, the ExeGIS HBSMR database and archive of the Norfolk Historic Environment Record (NHER; formerly Norfolk Sites and Monuments Record). The NHER is soon to be made accessible online, by means of the Norfolk Heritage Explorer website. Data will also be supplied to the National Monuments Record (NMR). Full details of the aims and archaeological scope of the project, of the mapping conventions used and the photographic sources consulted for the Coastal Zone, are given in Appendix 1.

## 2 The Character of the Norfolk Coast

### 2.1 Introduction

Norfolk is a mainly rural county, with a subtle but varied topography. Although it now has a relatively low population density, it was one of the most densely populated parts of the country during the medieval period, with Norwich becoming the second city of England by the early 16th century. The county lacks extensive mineral resources, such as coal or ironstone, and did not play a major role in the Industrial Revolution. As a result of this it did not witness the growth of large cities or industrial landscapes to change its rural character.

The coastline is one of the principal features of the county and accounts for around 40% of its boundary. The position of Norfolk means that historically it has looked outward across the North Sea to northern Europe. The numerous ports and harbours present around its coast in the medieval period are an indication of its involvement in continental trade and communications. Exports of corn, cloth and wool – products of the inland rural economy – were balanced by imports of coal, salt and wine. The coast also placed the county at the forefront of cultural and population migrations, with Norfolk being one of the main areas of evidence for Anglo-Saxon settlement in Eastern England. In military terms too, the Norfolk coast was of paramount importance. From the shore forts of the Roman period, through the Armada fortifications of the 16th century, to the extensive World War Two defences, it played a nationally important defensive role. From the mid-19th century onwards the Norfolk coast has taken on a new guise, with tourism becoming an economic mainstay along much of its length.

### 2.2 Topography

The Norfolk coast has a varied topography, resulting from its range of geology and soil types. The width of the Coastal Zone, which in some places extends 10km inland, means that it incorporates both upland and lowland areas, providing a representative sample of the topography across the northern half of the county. Three lowland areas are present in the Coastal Zone. These lie entirely below 5m OD, and some sections are actually below sea-level. In the extreme west of the county the project area skirts the southeast corner of The Wash and forms part of the Fenland region. Along the north coast, areas of marshland protected by offshore sandbanks and spits, are present between Holme-next-the-Sea and Salthouse (Fig. 2.1). In the east of the county large areas of low-lying ground form an outlying part of the Broads region. The area of the Broads that falls within the Coastal Zone comprises reclaimed marshland, much of which developed over parts of the former Great Estuary at Halvergate. Lying between this area of marshland and the sea are the Isle of Flegg and the Lothingland peninsula, which rise up to a height of c. 20m OD.

The upland areas of the Coastal Zone are mainly located immediately inland from the coast. The higher ground starts in the west with the chalk escarpment, which rises in places to over 65m OD. The cliffs at Hunstanton are one of the two places on the coast where the higher ground penetrates the low-lying coastal fringe and reaches the sea (Fig. 2.1). The upland area continues across north Norfolk, including the heathlands around Salthouse and Kelling, to the Cromer Ridge and the rolling landscape of the northeastern part of the county. The Cromer Ridge reaches a height of over 90m OD in the Sheringham area, with much of the rest of the northern uplands attaining 40–50m OD. This landscape is punctuated by a series of valleys associated with rivers and streams flowing northwards into the coastal saltmarsh area. The upland area in the northeast of the county is somewhat lower, typically rising to between 10m and 30m in height. As the uplands reach this area, they once again break through the lowland fringe and form coastal cliffs between Weybourne and Happisburgh.

### **2.3 Geology and Soils**

In common with much of Eastern England, the solid geology of Norfolk has a regular pattern, with bands of different rock types forming a north-to-south aligned grain. These strata dip gently towards the east, so that the oldest rocks lie in the west of the county with younger deposits to the east (Funnell 2005, 4; Williamson 2006, 12). In the west, below the Fenland basin and King's Lynn, are the Upper Jurassic Kimmeridge Clay deposits. To the east, these are overlain by the Lower Cretaceous Greensands, which include uncemented deposits like the Sandringham Sands and other strata bonded by iron oxides to form the distinctive brown sandstone known as Carstone. The Lower and Middle Chalk form a roughly north-to-south aligned escarpment through west Norfolk, which is followed by the course of the Peddars Way Roman road. These rocks, including the Red Chalk, outcrop in the northwest corner of the county, forming the cliffs at Hunstanton (Fig. 2.1). Much of the central part of the county, and the section of coast approximately between Brancaster and Weybourne, is underlain by the Upper Chalk. The solid geology of the eastern part of the county comprises soft marine sands and gravels of the Norwich Crag formation. These were deposited in a precursor of the modern North Sea during the Pliocene and early Pleistocene periods, between 3.5 and 1.6 million years ago (Chatwin 1961, 41; Williamson 2006, 12).

The drift deposits that overlie the solid geology dictate the character and topography of the county. The bulk of these have been deposited by successive glacial events, with continental ice sheets advancing and retreating during the Quaternary period. The earliest glaciations did not extend as far south as East Anglia, but sands and gravels were deposited by meltwater channels across parts of the county in the interglacials that followed. During the Cromerian interglacial in particular (c. 750,000 – 480,000 B.P.), the sands, gravels and laminated clays of the Cromer Forest Beds were deposited under deltaic freshwater and estuarine conditions by a 'proto-Thames' river that flowed northwards across the east of the county. They outcrop intermittently along the coast between Weybourne in north Norfolk and Pakefield in Suffolk

(Chatwin 1961, 57; Funnell 2005, 4-5). The Cromer Forest Beds are famous for their plant and animal remains, and it is from these deposits that the fossilised bones of an early mammoth (*Mammuthus trogontherii*) were excavated in advance of cliff erosion at West Runton in the 1990s (Ashwin & Stuart 1996). The Anglian Glaciation (c. 480,000 – 430,000 B.P.). resulted in significant drift deposits being laid down across much of the county. The dark grey, clayey Cromer Till was deposited along the north coast, along with sandy Norwich Brickearth across parts of northeast Norfolk. A second glacier brought in material derived from central England and deposited a boulder clay, known as the Lowestoft Till, across the central part of the county. The meeting of these two glacial lobes resulted in massive disruption of the drift deposits and the underlying solid geology, creating the high ground of the Cromer Ridge. The Blakeney esker, a 3.5km gravel ridge, was deposited as the ice retreated, marking the position of a sub-glacial stream (Williamson 2006, 14). The final glaciation, the Devensian, resulted in the deposition of the Hunstanton Till along the north coast, with fans of outwash gravels occurring further inland on Salthouse and Kelling Heaths (Funnell 2005, 5).

The glacial deposits that cover much of the county have a major influence on its soils, and their pattern within the Coastal Zone is complex (Fig. 2.2). The silt fen or marshland in the far west of the county has calcareous silt and clay soils, derived from alluvial deposits laid down in the post-Roman period. The marshland to the north of King's Lynn and the valley of the Babingley River comprises poor-draining stagnogley soils overlying the Gault Clay. The West Norfolk Lowland lying between this marshland and the chalk escarpment to the east is characterised by poor acidic soils, derived from the underlying Cretaceous sands with pockets of peat and clay.

The northwest of the county is dominated by the Chalk Scarp and Good Sands. These comprise a broad expanse of reasonably fertile calcareous and loamy soils on the slopes and valleys, with poorer sandy soils on the intervening plateaux. In the northeast of the county is the large area of the Rich Loam soils, widely used for arable cultivation. The mixed sandy and loamy soils of the northwest and the fertile loams of the northeast merge in a zone along the Cromer Ridge. The lower-lying fringe of the North Norfolk Marshland along the coast comprises a mixture of peaty and silty alluvial gleyed soils. The far east of the county is dominated by the Broadland zone with a mixture of peat and silt/clay deposits along river valleys and filling the former Great Estuary. These surround two areas of slightly higher ground, the island of Flegg and the Lthingland peninsula, which also have fertile loam soils like those of the northeastern part of the county (Corbett & Dent 1994, 18; Williamson 2005, 8).



## **2.4 Coastal Change**

By the Neolithic period, the coastline of Norfolk was broadly similar to that we know today (Murphy 2005a, 7). However, during the millennia that have followed, it has experienced a long and complex history of change brought about by fluctuations in sea-level and the continual processes of erosion and accretion.

### **2.4.1 Erosion**

The geologically recent origin of many of the deposits on the Norfolk coast means that they are generally soft and unconsolidated, making them extremely vulnerable to erosion. The section that is most threatened by this process are the cliffs between Cromer and Happisburgh in the northeast of the county. The rapid rate of erosion on this stretch of coast is due to a combination of the soft nature of the till making up the cliffs and the angle at which the waves hit the beach. The northeasterly prevailing wind direction drives waves straight onto the shore, dragging away beach material and moving it to the west and south through the action of longshore drift. Currently, the worst affected section of the coast is at Happisburgh, where up to 170m has been lost in the past sixty years. An entire road of sea-front properties has fallen into the sea since the 1950s (Fig. 2.1), and the 14th-century church of St Mary (NHER 7091) now lies less than 150m from the cliff edge.

Although Norfolk has lost nothing on the scale of the town of Dunwich in Suffolk (Hegarty & Newsome 2005, 7), the loss of settlements to coastal erosion can be attested from the medieval period onwards. Most notable among these is Eccles-next-the-Sea (NHER 8347, Lessingham) where the village was severely inundated by the sea during the early 17th century, leading to its gradual demise. The tower of St Mary's Church, Eccles, (NHER 8346) remained standing amongst the retreating dunes until it finally collapsed during a fierce storm in 1895 (Fig. 2.3). Fragments of masonry from the church and other remains of the settlement are frequently exposed on the beach after storms (see Case Study XXXIV below).

Erosion does not only affect the visible deposits which form the cliffs, but it also strips away earlier deposits that are only exposed in the inter-tidal zone as the coastline retreats. These earlier strata include peat and clay deposits at Lessingham and Sea Palling which are associated with prehistoric finds (Case Study XXXIV). Internationally important Lower Palaeolithic Cromer Forest Bed deposits have been exposed on the beach at low tide at Happisburgh, from which a handaxe, other lithics and faunal remains have been recovered (NHER 35385).

Another feature of erosion on the Norfolk coast is dune recession. While this is not as dramatic as cliff erosion, it is a serious threat to some sections of the coast. Its impact is well illustrated by the discovery of two Bronze Age timber circles, including the site dubbed 'Seahenge', at Holme-next-the-Sea (NHER 33771). The excavated circle, dated to around

2050 BC, was located on an eroding peat bed exposed on the modern beach due to the retreat of the dunes. The circle had originally been constructed in a saltmarsh environment, some distance from the sea, and was later engulfed by reed swamp and alder carr. Elsewhere, eroding dunes at Winterton revealed Roman ditches on the beach in the winter of 2003 (NHER 40106). These two examples demonstrate how deposits of different periods are being exposed by dune recession along several sections of the coast.

#### **2.4.2 Accretion**

The high rate of erosion on the northeast coast is balanced by accretion elsewhere. This occurs mainly through the process of longshore drift, moving the eroded sediment steadily along the coast to form extensive sand and shingle spits. The prevailing northeasterly direction from which the waves approach the beach means that material is eroded from the northeast to the west along the north coast and to the south along the east coast. The scale of this process is demonstrated by the two great spits on the north coast: Blakeney Point and Scolt Head Island (Fig. 2.1). These act as a slowly moving barrier, protecting the land behind and allowing areas of saltmarsh to develop. Their gradual westward progress has been both a benefit and a detriment to settlements along the north coast. The various creeks and channels through the saltmarsh provided sheltered harbours, partly shielded from the worst effects of the North Sea by the spits. The Roman shore fort at Brancaster (NHER 1001) lies adjacent to the Mow Creek channel and appears to have been served by such a harbour. When the fort was constructed the channel would have provided direct but sheltered access to the sea. Now, after 1800 years of the westward advance of Scolt Head Island, the channel follows a circuitous route. During the medieval period, a group of three ports – Blakeney, Wiveton and Cley next the Sea – existed around Blakeney Haven, at the northern end of the Glaven Valley (Rutledge 2005, 78). These three ports declined when the harbour silted up as a result of the progress of the Blakeney Point spit, a process which left Wiveton entirely landlocked. The course of the Blakeney Channel, which still serves the village, has lengthened and shifted almost 3km to the west since the late 16th century alone, giving some impression of the scale of the movement (Hooton 1996, 13-22).

Environmental work and the nature of the deposits on the east coast in the Broadland region of the county, have enabled a detailed picture of its development to be formed. The landscape of the Norfolk Broads is essentially defined by the three main river valleys: the Yare, the Waveney and the Bure. In the early post-glacial period these rivers discharged into an open estuary occupying much of what is now the Halvergate Marshes. A subsidiary channel, separated from the main estuary by the higher ground of the Isle of Flegg, occupied what are now the headwaters of the River Thurne, in the low-lying land between Winterton-on-Sea and Waxham. Rising sea-levels during the Mesolithic period meant that these previously fast-moving rivers grew more sluggish, and areas of fen started to develop on the valley floors, gradually forming the Lower Peat deposits. As sea-levels continued to rise, tidal

conditions penetrated further inland, depositing layers of sand, clay and silt in the Halvergate estuary and covering the peat deposits in the middle reaches of the valleys. Around 3000 BC the build-up of a substantial sandspit blocked the mouth of the estuary and diverted the course of the River Yare southwards. This allowed further peat formation in the middle reaches of the valleys (Williamson 1997, 11-12).

During the Bronze Age the spit across the embayment was breached, again allowing tidal penetration. By the Late Iron Age the spit had disintegrated completely, creating an open estuary once more. In the Roman period this consisted of an area of open water, tidal mudflats and saltmarsh known as the Great Estuary (Fig. 8.1). The mouth of the estuary lay where Great Yarmouth is now located (Williamson 1997, 12). The Thurne channel also experienced tidal conditions, but it is not clear if it was connected to the sea at its eastern end as well as to the Great Estuary to its southwest (Horton et al. 2004). It has been suggested that the Thurne channel was separated from the sea by a natural barrier during this period (Lambert et al. 1960, 46). The most recent silting of the main estuary commenced during the Anglo-Saxon period and was brought about by further changes in sea-level and the regrowth of the shingle spit upon which the town of Great Yarmouth later developed. Gradually the estuary was replaced by expanses of marshland, leaving Breydon Water as its sole remnant. During the medieval period exploitation and adaptation of this landscape began to create the character of the Norfolk Broads that exists today. In the middle reaches of the river valleys peat extraction resulted in the formation of the broads, while in the former estuary drainage and reclamation of the marshland was taking place.

An equally complex pattern of landscape development can be traced in the Fenland at the western end of the Coastal Zone. The accreting coastline of The Wash is one of the few areas in the country where it has been possible to determine the pattern of sea-level change with some degree of accuracy. This is due to the nature of the deposits in the Fenland basin and to extensive fieldwork and environmental analyses carried out as part of the Fenland Survey in the 1980s (Hall & Coles 1994; Waller 1994).

The palaeography of the Fenland basin has been reconstructed from the Mesolithic period onwards. However, it is only the last two and a half millennia that are directly relevant to the NMP Coastal Zone as earlier landscapes lie buried by later deposits. During the Iron Age a marine transgression resulting from a rise in sea-level, deposited silty clay around the edge of the modern Wash. A marine regression in the early Roman period allowed for the reclamation and settlement of the area of marine silt deposits known as the Terrington Beds (Murphy 2005a, 7). Sea levels rose again in the late Roman period, resulting in the abandonment of some Fenland and coastal sites (Hall & Coles 1994, 114). Elsewhere in the Fenland, beyond the Coastal Zone, cropmarks of extensive Roman field systems stop abruptly where they become masked by these later silts, revealing the limit of the transgression. A further marine

regression in the late Saxon period made the silts useable once more, and large-scale colonisation and reclamation followed. From the 12th century onwards these reclaimed areas had to be defended against a further phase of transgression (Williamson 2006, 19).

## **2.5 Land Use**

The modern land use of the Coastal Zone is quite varied. As outlined at the start of this chapter, Norfolk is a predominantly rural county and large parts of the project area are under arable cultivation (Fig. 2.1). Mapping by the Norfolk Historic Landscape Characterisation project has revealed that most of this is represented by modern fields created through late 20th-century agricultural improvement. However, some pockets of 18th- and 19th-century enclosure survive on the sandy soils of the chalk uplands in the north and northeast of the county (Paul Thorogood, NLA, pers. comm.). Pastoral agriculture does not occur often in the Coastal Zone (or indeed in Norfolk as a whole) with the main areas lying on reclaimed marshland, such as Halvergate (Fig. 2.1). Within that area of marshland, aerial photographs reveal that the extent of the pasture has diminished significantly during the second half of the 20th century as fields have been converted to arable.

Woodlands are not abundant within the Coastal Zone, with the main area stretching intermittently along the Cromer Ridge. Additional plantations lie adjacent to the beach at Holkham and along the Greensand Belt in the west of the county (but the latter lies mainly outside of the project area). Smaller areas of woodland are located around the edge of broads in the east of the county. Landscape parks associated with great houses range in size from vast estates such as Holkham Park (NHER 1802) down to smaller examples such as Hunstanton Park (NHER 30464). Small areas of heathland survive in the central part of the Coastal Zone, as at Salthouse and Kelling. Heaths and commons were much more numerous in the past, with many lost to enclosure during the post medieval period.

The main urban centres in the Coastal Zone lie at opposite ends of the county, with King's Lynn in the west and Great Yarmouth in the east (Fig. 2.1). Both are situated on major rivers and developed from Late Saxon origins into important ports during the medieval period. Smaller towns with medieval origins, such as Wells-next-the-Sea, Sheringham and Cromer, are dotted along the coast. Although industry has played a role in the post medieval and modern development of King's Lynn and Great Yarmouth, it is mainly the rise of tourism that has influenced the recent growth of the coastal towns. Cromer's origins as a resort stretch back to the 18th century, but it was the coming of the railways in the second half of the 19th century that accelerated seaside development. Hunstanton was established as a planned resort in the mid-19th century, with Cromer and Great Yarmouth also expanding during this period. It was during the 20th century that seaside tourism was to have an impact on the greater part of the coastal landscape. From the 1930s holiday camps began to be established

at relatively undeveloped locations on the coast, with vast caravan parks supplementing these later in the 20th century.

The defensive role of the coast in both World Wars also had an influence on its character. Large areas of the Coastal Zone were taken up with defensive structures, training areas and military camps during these conflicts. Although much of the evidence for this activity has long since been removed, surviving structures and some active military sites (e.g. RAF Trimingham) remain within the Coastal Zone.

The Coastal Zone is an area of great variety. Topographically, it includes the highest and lowest parts of the Norfolk landscape, ranging from upland heaths to reclaimed marshland. It is mainly an arable landscape, with pasture, woodland and heathland accounting for only a small part of its total area. Urban and industrial activity is focussed on King's Lynn and Great Yarmouth. The significance of the character of the Coastal Zone to the NMP mapping is discussed in the following chapter.

### 3 Factors Affecting the Results of the Survey

As is the case with any archaeological survey, the results of the Norfolk Coastal Zone NMP have been influenced by a number of different factors. Some of these factors are inherent in the NMP methodology, or in the nature of aerial photographic evidence and its interpretation. Others relate to archaeological work undertaken both before and during the project's lifespan. The effects are evident in both the number and nature of the sites recorded in different environments and under different conditions. While overall the project can be regarded as a success, these factors need to be kept in mind in the interpretation of its results.

#### 3.1 NMP Methodology

The comprehensive interpretative and analytical aerial photographic survey provided by the NMP has made a vital contribution to our understanding of the historic environment of Norfolk's Coastal Zone. The project has created 3,354 new sites in the NHER and amended 915 existing records. Although the 'new' records include previously recorded sites that have been split into separate elements, this still represents a substantial proportion of previously unrecorded archaeology; indeed, it corresponds to an 9.24% increase to the NHER as a whole since the project began, and a staggering 69.14% increase in sites recorded within the study area. In addition to the identification and interpretation of sites visible on aerial photographs, the project has provided accurate locational data for each site recorded. The NMP mapping has also allowed the morphology of 962 of the larger and more complete sites to be characterised. Although some aerial photographic transcription of certain sites had been undertaken prior to the start of the project, and some has been done (and will continue to be done) under the auspices of PPG16 or as part of specific research projects, only the uniform and wide-ranging approach of the NMP can provide a standardised dataset and near-unbroken coverage of this level of detail.

The NMP has proved to be of particular value in Norfolk, where the industrial-scale agriculture that covers most of the county has left few surviving earthworks but there are extensive areas of cropmark-productive soils. Norfolk benefits from its own collection of aerial photographs – the Norfolk Air Photo Library (NAPL) – a large component of which is made up of specialist oblique photographs taken by Derek Edwards (formerly of Norfolk Landscape Archaeology (NLA)) over the course of approximately twenty-five years. In those areas already completed, the NMP has maximized the potential of this important resource, identifying new sites either on photographs where a more dominant feature had been recorded, or on those which had not previously been studied. The use of historic photography, dating back to the 1940s (and sometimes earlier), has allowed the recognition of former earthwork sites which have since been levelled, and of all types of sites in areas that are now obscured by post-war development. The use of a wide range of photographs, from several collections, has included

some which have proved to be particularly productive. Vertical photographs taken by Meridian Airmaps Ltd in the summer of 1976 have recorded numerous cropmarks visible only on these photographs: the Coastal Zone NMP appears to be the first archaeological project to make use of this invaluable source.

This is not to say that the methodology employed by the project has been entirely unproblematic. For example, the standardised drawing conventions which are currently used limit the amount of detail that can be conveyed through the mapping, which at complex sites is also difficult to record by means of descriptive text. The current HBSMR thesaurus terms, and the way in which they are used, have also led to difficulties in retrieving records from what is a very large dataset. It is hoped that for future projects within the county, these methodological aspects can be refined.

The decision to include within the Coastal Zone a broad area of coastal hinterland has proved to be of great benefit to the project. Many of the sites mapped by the NMP, although located close to the coastline, do not have a direct association with the sea, and are not by nature 'coastal'. Allowing a significant portion of land to be investigated has enabled much of this archaeology to be understood in context. In contrast, the Suffolk Coastal NMP project mapped only a 1–2km wide strip along the coast and estuaries. As a consequence, the portions of field systems and settlement complexes seen as cropmarks on the higher ground were difficult to understand in terms of their wider archaeological setting (Hegarty & Newsome 2005, 16). At the same time, given the varied topography and character of the Norfolk coast, it must be remembered that each land area mapped represents only a small part of one of Norfolk's sub-regions (e.g. see Williamson 1993, fig. 1.2). A better understanding of many sites within the Coastal Zone will be gained when similar data exists for a greater portion of the county. A sub-regional perspective, and the development of more synthetic narratives of specific periods and site-types, is at present difficult to achieve.

### **3.2 Photo Coverage, Aerial Reconnaissance and Previous Air Photo Interpretation**

The issue of photo coverage (i.e. the number of photographs available for a particular site or area) is not directly linked to the number of sites identified: a few good photographs from a 'cropmark summer', or a single clear vertical photograph of a World War Two military installation, can be more useful than hundreds of non-specialist obliques or verticals taken at an unsympathetic time of day or year. In practice, however, the quantity of photographs for each Ordnance Survey quarter sheet has translated into a greater or lesser number of archaeological sites being recorded, and has also affected the amount of detail recorded at each site. This is particularly the case for World War Two sites. Where the only 'wartime' coverage is a single set of photographs taken in 1945–7 by the RAF for the National Air Survey, then the NMP mapping and recording will be limited: often defences and other military installations had been removed by this date or, at coastal sites, had been eroded or

covered by sand. Where a whole series of photographs are available – verticals and obliques taken at various times during the 1940s, for example – more detail has been captured, in particular the various changes that took place at many sites during the war years. The availability of very high numbers of wartime photographs of Great Yarmouth and Gorleston-on-Sea, including high-resolution, low-level verticals from 1945, has allowed a huge amount of data to be recorded for this important Defended Area, from extensive anti-aircraft batteries to individual air raid shelters in the gardens of private houses (see Section 11.3 below). The National Air Survey photographs of c. 1946 are still extremely significant, however, in that they provide the earliest blanket coverage of the county, and therefore provide a useful *terminus ante quem* and *terminus post quem* for military and non-military sites alike.

Variations in aerial photographic coverage have also had a significant impact on the mapping of cropmark sites. Large numbers of photographs, taken in a variety of different years, not only provide more opportunities for capturing the formation of cropmarks, but can also help confirm, or refute, the archaeological origin of a particular site. (A cropmark that is visible and convincing on a number of photographs from different years is more likely to have been recorded as an archaeological site.) As has already been described, the availability of exceptionally productive photographs, such as the Meridian Airmaps Ltd runs from the summer of 1976, can also have a very significant impact on the number of sites recorded. Amongst the specialist oblique photography, much of which was taken years and often decades before the start of the project, there is a notable tendency for certain areas to have become ‘honey pots’. In these areas – northeast Norfolk, for example, where the soils are predictably conducive to cropmark formation – certain sites, or even parishes, have been repeatedly photographed. In other areas the specialist coverage is poor, although the NMP mapping has now demonstrated, often through the consultation of vertical photographs, that they are far from empty in terms of cropmark sites. The issues raised by this dichotomy, between observer-directed photography of specific (often previously recorded) sites and the more ‘objective’ continuous coverage usually provided by non-specialist vertical surveys, is one that continues to be debated within aerial archaeology as a whole.

Since the work of Derek Edwards as Air Photographer for NLA ceased in 2000, aerial reconnaissance within the county has been limited. A number of local fliers, in particular Mike Page, have continued to contribute new photographs (sometimes of new sites) to the NAPL, but the process has been largely one-way. Within the Coastal Zone there has been little opportunity for the NMP team to request photography of a particular area or site, although in certain circumstances the services of English Heritage’s reconnaissance team has been called upon (Section 3.3 below).

Prior to the NMP starting in Norfolk, there were a number of more limited attempts to transcribe and record archaeological sites visible on photographs held by NAPL and, to a



lesser extent, in other collections. Basic sketches of cropmarks and other features (mainly those visible on Derek Edwards' specialist obliques) had been added to the county's paper 1:10,000 Sites and Monuments Record (SMR) maps, while more detailed manual transcriptions existed for some sites on an accompanying overlay. The Norfolk Earthworks Project (published in Cushion & Davison 2003) was preceded by a survey of aerial photographs, by Myk Flitcroft (formerly of NLA) among others, including Norfolk County Council's BKS colour vertical survey from 1987–8. In the mid-1990s, Danny Voisey (formerly of NLA), undertook the survey of a large proportion of NAPL's collection of 1970s Ordnance Survey vertical photography. Brief descriptive records were added to the NHER (then Norfolk SMR) and some manual transcription was undertaken. Where available, the results of these various efforts were incorporated into the work of the NMP. One of the main benefits of the more recent project has been to provide transcriptions of previously recorded sites that are both more accurate and more detailed, through the use of digital rectification and by mapping within a digital environment.

### **3.3 Inter-Tidal Environments and the NMP**

One of the main objectives of the project, as part of the RCZAS, was to identify surviving structures within the inter-tidal zone. The Norfolk NMP has generally encountered a low incidence of inter-tidal structures on the consulted aerial photographs (see Chapter 12 in general and Section 12.7 in particular for discussion). This matches the situation in Suffolk, where the Coastal NMP recorded very few features of any date within the inter-tidal zone (Hegarty & Newsome 2005, 15). The low rate of inter-tidal visibility in Norfolk and Suffolk is in contrast to the more productive Essex estuaries (see Section 12.7.1).

Inter-tidal structures, whether fish traps, jetties or wrecks, were much more likely to be recorded by the field survey element of the RCZAS (see Section 12.7.2). This is in part due to these structures being obscured by layers of silts and sand and being partially submerged even at low tides. It has become clear from the results of these two Coastal NMP projects that in order to locate inter-tidal sites, specific and targeted aerial reconnaissance is needed, undertaken at the right time of year and taking the tides into consideration (see Section 12.7.1). In 2000, Damian Grady (Head of Aerial Reconnaissance at English Heritage) flew The Wash and north Norfolk, with the specific intention of photographing sites in the inter-tidal zone. The recce revealed several inter-tidal sites, which due to the problems presented by their environment, were not visible on any other aerial photographs. A number of site-types, such as shellfish beds and sea defences, which had not previously been the subject of specialist photography within the county, were also photographed. These results illustrate the benefits of targeted reconnaissance and recording, when the range of interest has a broad scope.

Small wooden structures embedded within peat deposits are especially hard to identify from the air, more so than those located on silts and sands, and they prove a particular challenge for aerial photographers (Damian Grady pers. comm.). It is telling that even known archaeological sites within the Norfolk Coastal Zone, such as the Bronze Age timber circles at Holme-next-the-Sea, were not visible on the available aerial photographs, other than those taken specifically of the excavation itself. This indicates that even sizeable structures like 'Seahenge' will not necessarily be identified using the standard NMP methodology. (Even if such sites were visible it would be difficult, if not impossible, to properly identify them from the photographs.) Herein lies the value of the multi-disciplinary approach of the RCZAS (see Section 12.7.2).

### **3.4 NMP and Field Survey**

In the six or so years since it started, the Norfolk NMP has liaised with a number of ongoing field survey projects, contributing baseline data in the form of maps and descriptive records, providing advice on aerial photographs and their interpretation, and responding (albeit briefly) to consultations on particular sites visible from the air. It has also incorporated the results of earlier, ground-based surveys, where available. The NMP's use of historic as well as modern aerial photography means that it has frequently been able to record earthwork sites which are now ploughed flat, as well as identifying new earthwork sites that for various reasons have previously been overlooked. At sites surveyed before the NMP started, such as those investigated by Brian Cushion as part of the Norfolk Earthworks Survey (Cushion & Davison 2003), it has often been possible to add new information, either details of the site itself or of associated features in the vicinity. These may be apparent as earthworks that were levelled prior to the field survey taking place, or as cropmarks or soilmarks within or surrounding the surviving earthwork site.

The Coastal Zone NMP's principal connection to an ongoing ground-based survey was through the provision of NMP data to the Rapid Coastal Survey team of Norfolk Archaeological Unit (NAU). When the RCZAS for Norfolk and Suffolk was initially conceived, it was intended that coastal NMP projects for both counties would be completed prior to the field survey element of the assessment being carried out. In Suffolk, because of varying time-scales, this did not happen. In Norfolk, NMP mapping was available for much of the coast by the time the field survey was undertaken (Robertson et al. 2005), but due to pressures on both projects there was little further exchange of information or discussion of individual sites. (A comparison of the results of the coastal NMP and the coastal field survey is given in Section 12.7.)

Other collaborations with those working in the field have been on a more local basis. In particular, the team have provided information on earthwork sites, both new and previously recorded, to Helen Paterson, formerly project officer of the Norfolk Monuments Management

Project (NMMP). This aspect of the NMP's work is likely to be continued through consultations with NLA's recently appointed Historic Environment Countryside Advisor. In The Wash, where the project mapped nearly 300 medieval saltern mounds, the NMP team liaised with Tony Vine, a local recorder, who had mapped many of the surviving earthwork examples. Ray Loveday, a member of the NMP liaison group, used NMP mapping to locate surviving prehistoric barrows (including at least thirty Late Bronze Age 'mini barrows') on Salthouse Heath and monitor their condition. Overall, this collaboration with field survey projects has been extremely fruitful for the Norfolk NMP, not only in providing on-the-ground corroboration of possible new earthwork sites, for example, but also by providing a direct means of disseminating NMP data.

An adjunct to this collaboration has been the two-way flow of information between the NMP team and Sarah Bates (NAU Archaeology) regarding the results of recent excavations along a gas pipeline between Bacton and Great Yarmouth (Bates & Crowson 2004; Bates in prep.). The pipeline cut through a significant portion of northeast and east Norfolk, and cut across several pre-NMP cropmark sites. These were made the subject of trench excavations, most of which lay within the Coastal Zone. The excavation results were at the post-assessment stage and being analysed prior to publication when the area was being mapped by the NMP. The provision of basic excavation data (AutoCAD drawings of trench plans, preliminary phasing, etc.) to the NMP team, and the flow of preliminary NMP data back to the project manager, benefited the interpretation of both the excavated features and the wider cropmark landscape.

### **3.5 Topography and Soils**

Outside of the inter-tidal zone, which is discussed above, and excluding World War Two military sites, which have a very different form, much of the archaeology mapped in the Coastal Zone has been visible as cropmarks at 'inland' coastal sites. The processes and conditions which lead to the formation of cropmarks, and the different geologies and soils on which they can be seen, are described elsewhere (e.g. Wilson 2000, 67-86; Chapter 2 above). The significant fact, in the context of the project reported on here, is that the varied topography, geology and soil background encountered along the Norfolk coast means that there are inevitably biases in the evidence. Specifically, the Greensand Ridge of west Norfolk and the loams of northeast and east Norfolk have long been known to be particularly conducive to the formation of cropmarks. In east Norfolk, for example, on the Lothingland peninsula to the south of Great Yarmouth, this has produced a phenomenal cropmark landscape which in its extent and complexity is unparalleled in the country. The problems caused by these biases in the attempt to reach some kind of overall understanding of the NMP results are discussed in more detail on a case-by-case basis in the following chapters.

Conversely, the build-up of alluvial, colluvial and marine deposits in river valleys, estuaries and other areas of low-lying land, particularly around the edges of the Broads, is likely to have

masked much of the evidence for early (i.e. pre-Roman or, in all probability, pre-medieval) activity in these areas. Such areas do not usually provide the right conditions for cropmark formation anyway, mainly comprising saltmarsh, mud flats, grassland and rough wetland vegetation. In general, only small portions have been converted to arable, and even then only relatively recently. On the drained marshland surrounding the Broads and Breydon Water, the extensive soil-, vegetation and cropmarks of former drainage systems are visible. These often encompass sinuous channels, which are remnants of the natural drainage system, as well as straighter, man-made elements. Most of these probably developed from the medieval period onwards and often elements of them are depicted on 19th-century maps. These features and the water-lain deposits they cut through hide any archaeological evidence of an earlier landscape. As drainage systems of this type are only found on the periphery of the Coastal Zone, and as they are not inherently coastal in nature, they will be discussed in more detail in a subsequent report covering the results of ongoing NMP mapping in the Broads Zone.

### **3.6 Land Use**

Norfolk is an overwhelmingly arable county; indeed, in many areas agriculture is practiced at an industrial scale. This has resulted in surviving earthworks being a rarity, but under the right conditions cropmark sites can be numerous. This bias towards cropmark (and, to a lesser extent, soilmark) evidence brings with it a range of problems associated with interpretation and dating: these effects are discussed in relation to specific periods in later chapters of this report.

There is little woodland in the county to mask archaeological sites, and extensive areas of permanent pasture are also scarce – landscape parks provide a useful snapshot of the range of earthwork sites that might once have been more widespread. Heathland is a more prominent feature of the coastal landscape: on the heaths of north Norfolk in particular, large numbers of prehistoric and World War Two sites have been recorded. In some cases, early photographs may record surviving earthwork barrows on heathland, which are later visible as soilmarks or cropmarks as portions of heath are converted to arable.

The urban centres of the Norfolk coast form a radically different environment for an NMP project to those just described. The modern remnants of historic towns such as Great Yarmouth, King's Lynn and Cromer, may mask evidence of earlier settlements or activity. The modern urban sprawl that surrounds them hides those archaeological sites visible on the earliest consulted photographs. Unsurprisingly, the towns have often proved to be fertile ground in terms of 20th-century military archaeology: in the quarter sheet covering the larger part of Great Yarmouth over 400 archaeological sites were recorded, the vast majority of which were of World War Two date. A notable aspect of modern development along the Norfolk coast is the growth of sites associated with the tourist industry: holiday camps, caravan parks and campsites are a typical feature of the coastline, and although relatively insubstantial they too have had an impact upon the results of the NMP project. For example,

some of the older camps became foci for military activity during World War Two, often providing accommodation for troops. More recent developments of caravans or chalets can mask areas of cropmarks, but may also harbour surviving 20th-century military structures. Some confusion can be caused by the similarity in plan of the toilet and shower blocks provided at modern campsites and surviving World War Two military buildings; both may be concrete, rectilinear and flat-roofed, and possess entrances screened by traverses, and it is not always easy to distinguish between the two.

## 4 Neolithic (4000 – 2351 BC)

### 4.1 Introduction

Sites of Neolithic date represent (as far as we can tell) the earliest features to be recorded by the NMP. In total, approximately 102 sites of known or potential Neolithic date were recorded by the project within the Coastal Zone, including probable examples of causewayed enclosures, long barrows and cursus monuments. Thanks to their distinctive morphology, ceremonial and funerary sites such as these are the aspects of the Neolithic that can be most readily identified – and studied – from an aerial perspective. This bias towards what we can loosely term ‘monuments’ is clearly problematical, not only for those undertaking aerial photographic analysis but for the study of the Neolithic as a whole. Regionally, settlement evidence for this period often appears to be unenclosed (see, for example, Garrow et al. 2006), and while there is plentiful evidence for the existence of sizeable active communities in the form of finds distributions (e.g. Ashwin 2005a, 18; 2005b, 20), these are generally difficult to link to the monuments known from aerial photographs. It is of course possible that some of the enclosures and field systems of Bronze Age and later date described below, had their origins in the Neolithic, but it is undoubtedly also the case that at present we are unable to recognise these more mundane sites on aerial photographs. Despite these limitations, aerial photographs have been, and will continue to be, one of our principal sources for this period, particularly in a highly agricultural county like Norfolk where few earthworks survive.

It has long been noted that one of the features of the prehistoric period in East Anglia is a scarcity of large field monuments, and particularly a lack of upstanding remains of the type known from Wessex (Lawson et al. 1981, 21-2; Bradley 1993, 8; Ashwin 1996). While it is clear that the county’s history of industrial-scale agriculture is in part to blame for this, there has been a suspicion that such monuments were never numerous. While aerial photographs and their analysis have added to the numbers of such sites known from the county, this relative scarcity, and the small size of the sites that are known, is still regarded as a distinctive feature, deserving further study (Ashwin 1996, 57, after Bradley 1993). Quite why this regional tradition should exist is not known. Perhaps the region’s insularity played a part, or it may reflect the size, mobility and dispersal of the communities living here. Certainly, rather than being seen as miniature versions of the ‘real thing’, Norfolk’s monuments might be better understood as a reflection of local concerns, values and histories. The standardised and comprehensive dataset provided by the NMP will be a crucial tool in developing a better understanding of these regional traits.

General overviews of the Neolithic in Norfolk have been given elsewhere (Ashwin 1996; 2005a; 2005b) and this report will instead focus on the monuments mapped by the project.

These are described below, grouped into conventional classes of monument for the purposes of comparison. In reality the classification of sites has been less clear-cut. This is largely because of the dichotomy within the evidence for the Neolithic from Norfolk: by and large only 'monuments' are visible on the aerial photographs but few such sites have been excavated within the county; on the other hand there is a wealth of material recovered as surface finds, as well as a growing number of excavated settlement and activity sites, but these are not visible on the aerial photographs. This situation is aggravated by the fact that there is no hard line between the late Neolithic and the early Bronze Age, nor for that matter between different site-types, such as long barrows, mortuary enclosures and cursus monuments which all share a similar shape in plan. Consequently, the date, function and character of many of the sites described below remains open to question, and their classification somewhat fluid.

The distribution within the Coastal Zone of the principal types of Neolithic site mapped by the project is shown in Figure 4.1. (A number of unconvincing examples of some types are not illustrated.) It can be seen that they are found across most of the project area but there is a marked concentration towards northeast Norfolk, and an apparent scarcity to the west where the damp, low-lying landscape of the Fens begins. The first of these two trends must at least in part be due to the responsive soils of the northeastern part of the county, which are very conducive to the formation of cropmarks. Despite this, the increase in possible Neolithic sites from this area has been startling, and it is possible that there was a genuine preference for the area's fertile, loess-rich soils (Ashwin 2005a, 17). That this distribution appears to contrast with that of at least some classes of Neolithic material (*ibid.*, 18) is a matter that requires further investigation.

The pattern described above is accentuated by the fact that the prehistoric ceremonial and funerary complex at Hanworth/Roughton lies within this northeastern area. This complex, which is described in more detail in Case Study I below, provides the most notable demonstration of a trait evident at many of the Neolithic sites mapped by the project. Few occur as isolated monuments. Often they occur in pairs or clusters, and even those which appear isolated on Figure 4.1 in several cases appear to have become the focus for later funerary activity. The prevalence of ceremonial/funerary or 'ritual' complexes is something that has been noted elsewhere in East Anglia (Loveday 1989, 71-77; Jones 1998, 101; Buckley et al. 2001, 158; Ellis 2004, 99).

It is also notable that most of the monuments are located close to watercourses, often the tributaries of major rivers: there are particular concentrations around the headwaters of the Ant and the Bure which drain into what is now the Broads. A relationship between Neolithic monuments, or monument complexes, and watercourses has been noted elsewhere (Buckley et al. 1988, 87; Jones 1998, 101; Ellis 2004, 100). Although it in part reflects the responsiveness, in terms of cropmark formation, of the soils within river valleys, it has been

demonstrated that some patterns at least may still be archaeologically significant (e.g. Loveday & Petchey 1982, 18). This pattern and the apparent preference for northeast Norfolk are both evident not only within the Coastal Zone but also further inland, suggesting that they do not simply reflect a bias towards those areas already completed by the NMP.

## **4.2 Causewayed Enclosures (Fig. 4.2)**

It is thought that the majority of causewayed enclosures were created in the fourth millennium BC (Oswald et al. 2001, 3), making them one of the earliest site-types identifiable on aerial photographs. Two possible examples were mapped by the project within the Coastal Zone: at Roughton (NHER 13358) and Salthouse (NHER 36398). A third possible site lies at Buxton with Lammas (NHER 7690), some distance inland. All the sites are plough-levelled and known only from aerial photos. None has been excavated, nor have any finds been recovered from the overlying ground surface at any of the sites. They have been interpreted as causewayed enclosures of the earlier Neolithic period principally on the basis of their morphology, but also with regard to their landscape setting, both in terms of natural topography and their relationship with other archaeological sites.

All three of the Norfolk sites are relatively small and circular in comparison to other causewayed enclosure sites in England, and they also lack the substantial, multiple ditches evident at many sites. This contrast in morphology has caused some to question their date and relationship to other causewayed enclosures, and to suggest that the Norfolk sites have more in common with hengiform monuments of the later Neolithic and Early Bronze Age (Ashwin 1996, 46). Without excavation, these questions as to the chronology and nature of the sites discussed here are difficult to answer. It can be said, however, that while the Norfolk examples may represent a 'local tradition', it is not necessary to assume that this occurred later than elsewhere in Britain. Groupings of 'normal' causewayed enclosures with shared characteristics have been identified in the Thames Valley and in the valleys of the Nene and Welland (Oswald et al. 2001, 108-112). The smaller dimensions of the Norfolk sites may be a reflection of the size and dispersal of the communities creating, maintaining and using them.

During the course of the project a number of other enclosures were mapped which might have their origins in the Neolithic. These lack the distinctive causeways evident at Roughton and Salthouse, however, and cannot be closely dated, although a prehistoric date is suspected on the basis of their morphology. They are discussed in more detail below (Section 5.4).

### **4.2.1 Roughton (NHER 13358)**

The site at Roughton is perhaps the best example of a causewayed enclosure from Norfolk; it was certainly the first to be formally identified as such (Edwards 1978, 93-4). It is part of an extensive landscape of ceremonial and funerary monuments of Neolithic and Bronze Age



date located in this part of northeast Norfolk (Case Study I below). Two probable long barrows or mortuary enclosures and at least one possible oval barrow/enclosure lie less than 40m to its northeast. The spatial relationship between causewayed enclosures and other earlier Neolithic monuments has long been recognised (Oswald et al. 2001, 114), in particular the close positioning of some enclosures and long barrows. Its occurrence at Roughton reinforces the Neolithic date suggested for the enclosure. The presence of a possible cursus a short distance to the north (Oswald et al. 2001, fig. 6.7) was not confirmed during the mapping. The enclosure occupies one side of a slight knoll on the lower slopes of a spur of land overlooking the confluence of two minor tributaries of the River Bure. A valley location, close to a stream or river, is a common feature of other causewayed enclosures (Oswald et al. 2001, 91-6), again supporting the suggested date and interpretation of the site at Roughton.

The enclosure consists of a single circuit of causewayed ditch, defining an area measuring 105m long and 92m wide. A narrow curvilinear cropmark visible just inside this circuit probably marks a palisade trench. A pair of particularly short and broad ditch segments on the northwest side of the enclosure may have defined an entrance (Oswald et al. 2001, 52, fig. 3.16), although it appears to be at least partially blocked by the palisade. A number of small pits may form part of the enclosure, while a larger pit may represent a contemporary internal feature. Externally, a possible annexe to the west and pairs of short ditch segments or elongated pits to the east might be contemporary but could equally be a product of later activity. Variations in the strength and outline of the cropmarks of the ditch circuit may reflect the reworking of ditch segments: the recutting of individual elements at different times, and the addition and removal of causeways.

#### **4.2.2 Salthouse (NHER 36398)**

The second potential causewayed enclosure lies on former heathland at Salthouse. It was photographed by Derek Edwards in June 1996, and subsequently recorded by the NMP (Brennand et al. 2002). Consultation of historic vertical photography has revealed that the site may have survived as a low earthwork until at least 1950, after which this part of Salthouse Heath was converted to arable. The monument is approximately circular, with a diameter of 60m. The ditch circuit appears to be made up of at least eight separate lengths; two large and amorphous pit-like features on its north side may represent further segments of ditch, which were perhaps disturbed or dug into at a later date. Traces of a low inner bank are visible. There are no obvious entrances, although its ditch circuit is perhaps slightly flattened on the southeast side, where a wide causeway corresponds with a break in the possible bank.

The site's topographic position differs from that seen at Roughton (and Buxton) in that it lies on an elevated south-facing slope rather than in a valley bottom. Nevertheless, the site does appear to be oriented towards a nearby watercourse, in this case a tributary of the River Glaven to its south. As at Roughton, the enclosure was part of an extensive prehistoric

funerary and ceremonial landscape; a probable long barrow or mortuary enclosure lies 335m to the southwest of the site (NHER 27173), while the heathland to the north became home to a dense concentration of round barrows. The latter are thought to be mainly of Bronze Age date but some may have originated in the late Neolithic (see Case Study II below).

While several features of the Salthouse site – its inner bank, its valley-side location and its proximity to other prehistoric monuments – are characteristic of causewayed enclosures, there is still some uncertainty as to its interpretation. At 60m in diameter the enclosure is extremely small, even by Norfolk standards. It is also markedly circular in plan, although this may be exaggerated by the fact that its north side is rather unclear and may have been disturbed by quarrying or 20th-century military activity. It does, for example, bear a striking resemblance to the late Bronze Age enclosed settlement at Springfield Lyons in Essex (Priddy et al. n.d., 11, fig. 2). There are as yet, however, no obvious examples of this type of settlement known from Norfolk (Ashwin 1996, 54), and no material of this date has been found in the vicinity of the site. At the same time, similarly small and circular causewayed enclosures are known from elsewhere, e.g. Radley (Oxfordshire) and Great Wilbraham (Cambridgeshire) (Oswald et al. 2001, fig. 4.22; fig. 4.6), and therefore although the date and nature of this site must remain open to question, the interpretation outlined above is currently preferred.

### **4.3 Long Barrows, Oval Barrows and Mortuary Enclosures**

As is the case with other types of Neolithic monument, there are few examples of surviving earthwork long barrows in Norfolk, or indeed in the Eastern Region as a whole (Lawson et al. 1981, 21-2). Aerial survey has swelled the numbers of possible funerary sites known from the county by recording the soil- and cropmarks of a moderate number of plough-levelled examples and, in particular, of a group of elongated ditched enclosures whose plan resembles that of long mounds. The NMP has itself mapped twenty-two previously unrecorded examples of such sites within the Coastal Zone (out of the forty sites mapped in total) but there is still no evidence that such monuments were ever very numerous.

In the absence of further information, from excavation for example, the interpretation of these sites remains far from clear-cut. In only a very few cases are traces of an inner mound or bank evident (they are more generally visible as ditched enclosures), and none has produced any dating evidence. It is clear that in some cases there was no inner mound, as was almost certainly the case at Weasenham Lyngs, although this site did possess an internal bank (Petersen & Healy 1986). There is also no positive evidence, either from Norfolk or nationally, that such enclosures had a mortuary function. Consequently the date of these sites, their original appearance, and the ways in which they might have been used remains open to question. Analysis of their form, location and context, however, suggests that most can be

regarded, at least provisionally, as probable examples of Norfolk's Neolithic funerary tradition. Their distribution reflects that of the mapped Neolithic monuments as a whole.

Several presumed mortuary enclosures or long barrows have been excavated in the Eastern Counties in recent years. While in most cases this work has provided dating evidence to confirm their Neolithic date, it has generally failed to identify any evidence of funerary activity (Petersen & Healy 1986; Buckley et al. 1988; Wallis 1998; Robertson 2003). The morphology of these sites, however (i.e. their similarity in plan to confirmed burial mounds), points to an association with the dead. A trapezoidal enclosure at Eynesbury (Cambridgeshire), the plan of which conforms fairly closely to that of a 'typical' long barrow, was found to contain significant ritual deposits of various different materials, including human remains (Ellis 2004). This may be due in part to better preservation at the site, but probably also reflects monuments of this class being used in a variety of ways.

#### **4.3.1 Site Morphology (Fig. 4.3)**

The sites described below fit the pattern of supposed funerary sites typical of the Eastern Region, consisting of small (relative to the long barrows of Wessex), elongated or oval enclosures defined by a (more or less) continuous encircling ditch, with or without a mound (Lawson et al. 1981, 21-2; Jones 1998). A continuous ditch, rather than flanking side ditches, is a typical feature. It is seen at Norfolk's only excavated earthwork long barrow at West Rudham (NHER 3611; Hogg 1940), a site which produced only ambiguous evidence for burial (Ashwin 1996, 45). Among the sites mapped by the NMP a variety of different plans are evident, ranging from small oval enclosures as little as 16m long, to elongated oblong enclosures extending for more than 84m. Although there is a considerable difference between these two morphological extremes, overall they appear to represent a continuum within a single, wide-ranging class of site (Loveday & Petchey 1982). Examples of ring ditches and circular enclosures of possible Neolithic date, which might also have been used for funerary ceremonies, are discussed separately below.

The sites mapped by the NMP can be grouped according to their morphology, along the lines set out by Jones (1998). A basic distinction can be made between curvilinear and rectilinear plan forms: had they once possessed internal mounds, the former may have surrounded oval barrows (nationally a rare monument type), the latter long barrows. A number of good examples of oval barrows, such as Barrow Hill, Radley, and Maxey, appear to date to the Middle Neolithic, suggesting that there may be a chronological distinction between the two forms (Trevor Ashwin, pers. comm.). The curvilinear enclosures mapped in the Coastal Zone include both oval and ovoid (as in egg-shaped) plans; the rectilinear enclosures can be divided into oblong/rectangular and trapezoidal plans, and these then further subdivided according to whether they have rounded or straight terminals (Fig. 4.3). There is no clear pattern in the distribution of the two forms: both are found in greater numbers in the northeast

of the county. Amongst the rectilinear enclosures an orientation between westnorthwest-eastsoutheast and northwest-southeast seems to have been preferred, although five of the more doubtful sites (not illustrated) were oriented between northnortheast-southsouthwest and northeast-southwest. A similar preference may also be apparent amongst the curvilinear enclosures (Fig. 4.3), but in this case it is notable that the two surviving oval barrows (NHER 6292 and 6300) are oriented northeast-southwest. This is a more typical orientation for such monuments, and one that is evident amongst the Lincolnshire sites, for example (Ellis 2004, 104; Jones 1998, 91). Several of the Norfolk enclosures appear to have made use of distinctive local topography: the enclosure at Cley (NHER 27173) is located just below the summit of a slope, in a position where it could be viewed from the valley floor. To its west a gully leads down into the valley, allowing a good view of the area to the northwest.

Eleven rectilinear enclosures were identified, together with a further seven examples where either the archaeological origin of the cropmark or the interpretation of the feature is doubtful. Their subdivision into oblong and trapezoidal forms, and rounded or straight ends, is shown in Figure 4.3. Three of the enclosures – Weybourne (NHER 22883), Bradwell (NHER 43603) and Warham (NHER 38428) – are extremely long, measuring no less than 60m up to at least 84m; the only complete example, at Weybourne, is 72m in length. Their size and elongated plan suggests that they may represent long mortuary enclosures, a median group of monuments within the ‘cursus continuum’ advanced by Loveday and others (Loveday & Petchey 1982, 18; Jones 1998, 98-9). The remaining enclosures measure between 21.5m and 72m long, and their width is greater relative to their length. The example at Roughton (NHER 38485) is the most substantial, measuring 72m by 24m and defined by a cropmark ditch up to 2.5m wide. This has an uneven appearance, suggesting that it has been recut or that it was excavated as a series of pits; both practices are evident at excavated sites (Wallis 1998; Ellis 2004). The example from Cley next the Sea (NHER 27173) is more diminutive, measuring only 21.5m long and 11.5m wide, and it is oblong rather than trapezoidal in shape. The ditch around its southeastern end appears to be wider than the rest of the monument; this could parallel the more substantial ditch, containing numerous artefacts and structured deposits, that surrounded the northeast end of the Eynesbury long barrow (Ellis 2004, 16-23).

Twenty-one sites of curvilinear enclosures were identified, eight of which are dubious. To this number should be added Howe’s Hill oval barrow at Sheringham (NHER 6292); this still survives as an earthwork but was obscured by tree cover on the consulted aerial photographs and consequently could not be mapped. The group includes a second ‘acknowledged’ oval barrow at Bodham (NHER 6300), while traces of a mound were also evident at Titchwell (NHER 17738). As with the rectilinear enclosures, a variety of different plan forms is evident, while their size ranges from 16m by 13m (Southrepps, NHER 38903) to 49m by 40m (Ormesby St Margaret, NHER 33744). Two additional possible funerary sites are ‘oddities’, fitting neither the rectilinear nor curvilinear classification. One, NHER 29763 at Sheringham, is

defined by a C-shaped ditch, possibly the curved part of a sizeable D-shaped enclosure. Its proximity to several ring ditches suggests a probable funerary function, and it is comparable to a much larger D-shaped enclosure that appears to form part of an extensive funerary and ceremonial landscape at Markshall (NHER 9583; Wade-Martins 1999, 30). Within the Coastal Zone, a smaller D-shaped enclosure at Roughton (NHER 38674), close to the prehistoric monuments of Roughton Heath, could also represent a Neolithic mortuary site, although its interpretation remains very much open to question. It appears to have been double-ditched, with an inner bank and possible central partition, and is again reminiscent of the Markshall enclosure, albeit at a much reduced scale.

As has already been discussed, many of the possible Neolithic sites mapped by the project appear to have spatial, and therefore presumably also conceptual, relationships with other prehistoric monuments. This is certainly the case with many of the funerary sites described above, several of which appear to have become the focus for later activity of a similar nature, namely the construction of Bronze Age round barrows. The trapezoidal enclosure at Belton (NHER 43604) appears to have had a ring ditch added or incorporated into its northwest end, although the archaeological origin of this feature, as well as its chronological relationship with the main enclosure, is uncertain. The oval barrow of Howe's Hill (NHER 6292) is overlain by a bowl barrow located towards its eastern end (Schedule Entry for SM 115). Many of the enclosures mapped at Roughton and Hanworth were sited in close proximity to the possible causewayed enclosure and cursus monument located there. These are discussed in more detail in Case Study I below.

#### **4.4 Cursus Monuments**

Cursus monuments are one of the most varied, and most enigmatic, types of Neolithic site to be identified from the air. Most are thought to date to the second half of the fourth millennium BC, although two recently excavated examples at Eynesbury (Cambridgeshire) have produced particularly early dates around 4000 BC (Ellis 2004, 100). At the time of writing six possible cursus monuments are recorded in Norfolk, one of which (Hanworth, NHER 18190) lies within the NMP's Coastal Zone. A possible seventh example at Rollesby in the Broads Zone (NHER 40655) has been dismissed during more recent work by the NMP. As discussed above in the section on burial mounds, it has been suggested that long barrows, long mortuary enclosures and cursus monuments form a 'cursus continuum' of related forms, and their classification into different monument types can be somewhat arbitrary (Loveday et al. 1982, 18). Conversely, their superficial similarity of form may hide a variety of chronological and functional distinctions (Trevor Ashwin, pers. comm.). This needs to be borne in mind in discussions of the possible cursus at Hanworth, described below, which is diminutive in the extreme when compared to 'classic' sites, such as the Dorset Cursus. In the absence of other evidence, particularly from excavation, it is impossible to tell whether the 'minor cursus' at

Hanworth had more in common with long mortuary enclosures of the type described above than with the major cursuses of Wessex and elsewhere.

The Hanworth site lies 1.5km to the northwest of the probable causewayed enclosure at Roughton, and forms part of an extensive prehistoric funerary and ceremonial landscape (see Case Study I below). (As described above, a second possible cursus immediately to the north of the causewayed enclosure [Oswald et al. 2001, fig. 6.7] was not confirmed by the NMP mapping.) At Cardington (Bedfordshire) and Springfield (Essex) cursus monuments are located a similar distance away from causewayed enclosures, while at other sites the former have been shown to overlie the latter (Last 1999, 88).

The possible cursus at Hanworth is visible as the cropmark of a rectangular ditched enclosure with square ends, aligned northeast to southwest (Fig. 4.4). It measures 55m wide, and may be up to 380m long, but its northeastern end is not clearly visible. Its topographical location and orientation are likely to have been significant: it occupies a ridge of high ground almost equidistant between two minor tributaries of the River Bure, and may be aligned on the higher ground of Roughton Heath to its northeast. Its northeast-southwest orientation is one that is shared by other Neolithic monuments, including long barrows and mortuary enclosures (Ellis 2004, 104; Jones 1998, 91) and also the early Bronze Age timber circle at Holme-next-the-Sea (Brennand & Taylor 2003, 66-8). It equates approximately to the direction of the mid-summer rising sun and the mid-winter setting sun (*ibid.*).

The cropmark of the cursus ditch is masked in places, but a genuine break appears to exist at the southwest end of the Hanworth site, forming an entrance 6.5m wide. The possession of entrances at their terminal ends is not typical of cursus monuments, but examples are known from elsewhere (Jones 1998, 98), including the southern end of the north cursus at Eynesbury (Ellis 2004, fig. 4; 100). Two ring ditches at its southwestern end (NHER 11685) and a third at or within its northeastern end (NHER 38477) are likely to represent the remains of round barrows. Their size and elaborate form could reflect a Neolithic date but this is not necessarily the case (see below). They are arranged on a similar alignment to the cursus, but their chronological relationship with the larger monument is not clear. A small oval enclosure within the cursus (NHER 38478) may also be of Neolithic date and seems likely to have had a ceremonial or mortuary function. It is perhaps comparable to curvilinear enclosures or ring ditches at Brampton (Cambridgeshire) which include a small, penannular ring ditch within a Neolithic long mortuary enclosure and two curvilinear enclosures on the line of the outer ditch of the cursus (Malim 1999, figs 7.4a & b). Without closer dating evidence it is impossible to identify a chronological sequence for any of these features, but it is worth noting that a timber circle at the eastern end of the Springfield cursus (Essex) was thought to be a contemporary feature, albeit one that may have been constructed at a slightly different time (Buckley et al. 2001, 154-5).

#### **4.5 Ring Ditches, Polygonal Enclosures and Hengiform Monuments**

In addition to the monuments already discussed, the project mapped a variety of probable ceremonial and/or funerary sites for which a later Neolithic to Early Bronze Age date can be suggested. These include a number of large and, in most cases, complex ring ditches which may once have surrounded Neolithic round barrows. Although their size and elaborate form does not necessarily reflect an early date, often these appear to have become a focus for the construction of further small round barrows, presumably during the Bronze Age, suggesting a chronological distinction. It may be the case that some of these postulated early barrows were originally small, and were only enlarged over a period of time (Trevor Ashwin, pers. comm.), and they are discussed in more detail in the section covering the Bronze Age. They include the sizeable ring ditches within and at the southern terminus of the Hanworth cursus (NHER 11685 and 38477), as well as a very large ring ditch at Hopton (NHER 43526; Fig. 5.4) and another at Somerton (NHER 43425), which possess diameters of 82m and 70m respectively. The latter two sites are likely to belong to a class of giant ring ditch known from Cambridgeshire (Wilson 2000, 110). Their function is not entirely clear but traces of a probable central mound were visible within the Hopton example, which lies at the eastern end of a group of sixteen smaller barrows.

A ring ditch mapped at Southrepps (NHER 12850) is equally enigmatic. Here two relatively small ring ditches are visible, each with an external diameter of approximately 15m (Fig. 4.5). Ordinarily these would be interpreted as the probable remains of Bronze Age round barrows. The presence, however, of a polygonal enclosure around the southwestern ring ditch makes the site unusual. There is no obvious entrance in the outer ditch circuit; a slight weakening of the cropmark on the inner ditch's southeast side may mark a causeway that was either added or removed during the lifetime of the monument. A trio of pits has been mapped just inside the outer ditch but the background geology of the site is such that the archaeological origin of these features is uncertain. The pattern of a smooth, regular circular enclosure within an irregular or polygonal outer enclosure is associated with certain henges and hengiform monuments (Wilson 2000, 92). While it is not unusual for round barrow ditches to have a somewhat flattened or polygonal appearance, this trait is far more pronounced in the Southrepps example. Neolithic axeheads have been found nearby, and a very similar site has been mapped at the Thornborough henge complex (Matt Oakey, English Heritage, pers. comm.), suggesting a Neolithic date for the site. In the absence, however, of a visible bank or a clear entrance the morphology of the site cannot be described as truly hengiform. It could instead represent an elaborate Bronze Age barrow, or one that has later been enclosed for some reason. (It has been suggested as the site of a beacon but there is little evidence to support this association.) A similar site with a more substantial inner ditch has been mapped more recently at Aldeby (NHER 45032) in the NMP's Broads Zone.

As with other classes of Neolithic monument, few henges have been recorded in the county. Norfolk's best-known example of a henge (or at least a henge-like monument) lies at Arminghall, to the south of Norwich (NHER 6100). This site, which had an external diameter of approximately 90m, comprised a substantial bank flanked by a wide inner ditch and narrower outer ditch. At its centre was a horseshoe-shaped arrangement of post holes. It was first identified from cropmarks by a pioneer aerial photographer in 1929, and was excavated soon after (Clark 1936). With the exception of the postulated causewayed enclosure on Salthouse Heath, with its hengiform properties (see above), nothing on this scale was mapped within the Coastal Zone. Instead a number of much smaller possible hengiform monuments were mapped, including the polygonal example described above. By national standards, such monuments, which should be 20m or less in diameter, are characterised by their external banks, together with a single causeway or two opposed entrances (English Heritage 2007). They are generally thought to date to the later Neolithic to Early Bronze Age but a recently excavated example at Eynesbury (Cambridgeshire) produced an exceptionally early date in the early fourth millennium BC (Ellis 2004, 7-8; 102). In the absence of any evidence of a bank at most of the cropmark sites mapped by the NMP, the possession of a relatively substantial ditch, two opposed entrances, and/or swollen ditch terminals was used to distinguish possible hengiform monuments from 'ordinary' ring ditches. It should be noted, however, that at no site was such an interpretation felt to be certain. Often the difference between a hengiform ring ditch and a 'normal' ring ditch was far from clear-cut. Even when a site does appear to be characteristically hengiform, a degree of caution is necessary as it may not have a Neolithic ceremonial origin. Of a group of four henge or hengiform cropmark sites excavated in Essex, only two proved to be prehistoric in date (Brown & Germany 2002).

Excluding the Salthouse enclosure, four hengiform sites were mapped within the Coastal Zone. Three of these (Trunch, NHER 36492; Rollesby, NHER 38636; and Snettisham, NHER 39824) are of similar size and shape, measuring around 25m in diameter. The site at Snettisham appears to have opposed entrances; Trunch and Rollesby have just one entrance, defined in both cases by swollen or bulbous terminals. A more substantial double ring ditch at Stiffkey (NHER 27074) is bisected by a modern field boundary, exaggerating its hengiform appearance, but at least one of the breaks in its ditch circuits (that to the south) seems to represent a genuine entrance. A further two sites, at Burnham Thorpe (NHER 1020) and Burnham Norton (NHER 27051) are both defined by relatively narrow ditches and may instead represent the remains of round barrows. Five additional sites, measuring from 12m to 24.5m in diameter, were also recorded, but at these the hengiform characteristics are less pronounced and they are difficult to differentiate from normal ring ditches. One of these sites, at Witton (NHER 39221), was partly excavated (Lawson 1983, 20-1) but the results of this work were inconclusive. A possible circle of pits or post holes, which could plausibly date to the Neolithic, was mapped at Ormesby St Margaret (NHER 27403). It is sub-circular in plan, measures approximately 23m by 18m, and lies close to a probable barrow cemetery. Even if



a proportion of the sites just described do represent henge-like monuments dating from the Neolithic, which is far from certain, how such sites relate to the much larger complex at Arminghall is extremely unclear. The discrepancy in size alone would suggest a very different function or social context for the smaller sites.

An interesting adjunct to the sites described above is an unusual site (NHER 38501) which formed part of the extensive prehistoric complex at Roughton and Hanworth (see Case Study I below). It consists of a wide ditch with swollen terminals, forming a rather flat 'C' shape measuring 23m by 9m in plan. Its function is unknown, but it is assumed to be ceremonial or funerary in nature as it is surrounded by the cropmarks of several, probably Bronze Age ring ditches. Its hengiform qualities (i.e. its wide ditch and bulbous terminals) suggest that a late Neolithic or Early Bronze Age date is plausible. A very similar feature is known from aerial photographs of a barrow cemetery at Wormingford in Essex (Brown et al. 2002, fig. 5), where the prehistoric features are more nucleated than at the Norfolk site. There is another probable example at Lound in Suffolk, photographed by Derek Edwards in 1986 (NAPL ref: NHER TM 5199M-R). C-shaped ditches have also been identified close to the causewayed enclosure and cursus monuments at Fornham All Saints, Suffolk (Dyer 1996; Oswald et al. 2001, fig. 4.25; Martyn Barber, English Heritage, pers. comm.): while many might represent the partial remains of ring ditches, at least one (a horseshoe-shaped enclosure with pit-defined terminals and an entrance flanked by pits or large post-holes) resembles the C-shaped enclosure at Roughton. It has been interpreted as a plough-levelled barrow or hengiform enclosure (Dyer 1996, 14). A C-shaped arrangement of pits or post holes known from Helpston (Cambridgeshire) could represent a related monument type (Wilson 2000, col. pl. 12). Wilson (ibid., 107) notes that interrupted ring ditches are often incomplete, and that whether they represent a distinct monument type or simply incomplete round barrow ditches is not known. The 'finished' appearance of the site described here suggests that it was not simply left partially complete.

This loosely affiliated group of monuments is too varied, and the interpretation of individual sites too uncertain, for there to be much value in any overall analysis of their distribution and shared characteristics. It is worth noting, however, that in common with many of the other Neolithic sites mapped by the project, those just described often appear to have been sited in topographically distinctive locations. The probable hengiform monument at Stiffkey (NHER 27074), for example, occupies a valley floor location alongside a tributary of the River Stiffkey. In contrast, the C-shaped hengiform site at Roughton (NHER 38501), lies on the southeast-facing slope of a spur of land, surrounded on three sides by tributaries of the River Bure. The latter site also lies close to other prehistoric monuments, again a common feature of this group of sites: it overlooks Roughton causewayed enclosure and its associated Neolithic barrows 640m to the south, while a nucleated round barrow cemetery is visible 160m upslope

to the northwest. Associations of this type reinforce the Neolithic to Bronze Age date postulated for this class of cropmark site.

### **Case Study I: Neolithic Monuments at Hanworth and Roughton (Fig. 4.6)**

The parishes of Hanworth and Roughton in northeast Norfolk are remarkable for the extensive prehistoric ceremonial and funerary landscape evident (mainly as cropmarks) on aerial photographs of the area. As well as Neolithic long and oval barrows, a causewayed enclosure, and a cursus monument, numerous round barrows are known from the area, together with several Iron Age or Roman square barrows.

The complex lies about 6km inland of the modern coastline, on the dip-slope of the Cromer Ridge. It is an area of fertile, loam-rich soils which have proved highly productive in terms of cropmark sites. Like much of the county outside of the wetlands, the topography is gently undulating and commands wide views towards the south. The area covered by the Neolithic monuments measures approximately 1.36 sq km (Fig. 4.6), although by the Bronze Age its extent was considerably greater. It is bounded to its east and west by two substantial tributaries of the River Bure.

None of the Neolithic sites within the complex has been excavated, and dating evidence is scant. Consequently, establishing a chronology for its development is at present impossible, particularly given the extremely early dates derived from a recently excavated site in Cambridgeshire (Ellis 2004). Nevertheless, the siting of the individual monuments provides some clues to the relationships between them.

The earliest features of the monument complex may have been the causewayed enclosure (NHER 13358) and accompanying barrows (NHER 38485) at its southeastern extremity. It is tempting to speculate on the possible significance of the locale to Mesolithic populations, and material of this date has been recovered from the area. As described above (Section 4.2), the causewayed enclosure occupies one side of a low knoll, on the lower slopes of a spur of land jutting out into the river valley. Although they are now minor drains and beckes, in its original setting the enclosure was probably surrounded by water or damp ground for two thirds of its circuit. Its 'landward' side, to the northwest, coincides with the possible entrance identified by Oswald et al. (2001, fig. 3.16). The approach to this postulated entrance would have been constricted, and (if they had mounds) perhaps obscured by the line of burial mounds or mortuary enclosures to its northeast. This comprises what appears to have been two substantial long barrows or mortuary enclosures, together with a possible oval barrow or enclosure at the southeastern end of the group. Their chronological relationship with the enclosure is not known but it is difficult to believe that these monuments were not deliberately constructed in sight of each other. The apparent effect of the barrows on the possible approach to the enclosure may indicate that they are the later feature. Two further possible

oval barrows on the enclosure's west side (NHER 38496) could also have been placed to narrow the approach to the monument, but the archaeological origin of these features is far from certain.

The siting of a small cursus monument (NHER 18190) on higher ground 1.5km to the northwest of the causewayed enclosure may represent a break with tradition, but in the absence of a chronology for the complex, and given the generally enigmatic nature of cursus sites, this is not necessarily the case. Besides, the cursus may not have been sited in new, 'unconsecrated' ground, as a number of possible barrows or mortuary enclosures are visible in the area stretching from west of the cursus site, close to the western tributary, to the causewayed enclosure to the east. For the most part, the interpretation and even the archaeological origin of these features is uncertain, but finds of prehistoric date have been made across much of the area.

The morphology, dimensions and alignment of the cursus have been described above (Section 4.4). More can perhaps be said of the numerous cropmarks that surround it, although it is not clear how many of these are contemporary and/or related features. Chief among the recognisable elements are several ring ditches sited along – or incorporated into – its length. NHER 11685 comprises two ring ditches at the cursus' southwest end. These appear to be slightly off-centre and out of alignment with the cursus, but the southwestern ring ditch is in fact in line with the entrance in the monument's terminal end. The ring ditches are reportedly visible on the ground as low mounds, suggesting that they surrounded round barrows rather than hengiform monuments. They are large and relatively elaborate, and could be of Neolithic rather than Bronze Age date. They are both of roughly equal size (approximately 40m in diameter), of somewhat irregular shape, and defined by a ditch 3–4m wide. The southwestern ring ditch contains an inner concentric ditch and central cluster of three possible pits or post holes. The northeastern ring ditch is less elaborate, but also surrounds a number of pit-like features, which could have held posts or sepulchro-ritual deposits.

The ring ditches are matched by a second double ring ditch at or within the northeast end of the cursus (NHER 38477). This is again defined by a substantial ditch and is similarly irregular in plan. It surrounds a central pit or post hole and at 30m in diameter it is slightly smaller than the other two features. A more irregular, oval ring ditch that appears to be centrally positioned within the cursus is visible as a less substantial cropmark. It could have surrounded an oval barrow or mortuary enclosure, or perhaps held a timber setting, and it is comparable to the internal features evident within both the Brampton cursus in Cambridgeshire (Malim 1999, fig. 7.4a) and the cursus at Springfield in Essex (Buckley et al. 2001, fig. 34). It may have been an early, isolated monument, later enclosed by the cursus, or a contemporary construction. In contrast to the more substantial ring ditches, its morphology

and positioning in relation to the cursus do not suggest a Bronze Age date. Other features visible in the vicinity include a probable pit or post alignment, and a trackway leading up to the cursus from the east. Both of these, and many of the other cropmarks in the area, are probably of later date, although the trackway at least must have been laid out when the cursus still survived as a significant earthwork.

Ritual complexes of the type seen at Hanworth/Roughton, are a notable feature of prehistoric landscapes in the Midlands and East Anglia (Loveday 1989, 71-7), although in Norfolk and Suffolk these may be less numerous than elsewhere (Trevor Ashwin, pers. comm.). In general, they comprise at least one minor cursus, one or more long barrows or oblong mortuary enclosures, and one or more hengiform monuments or elaborate ring ditches. Large henge monuments are notably absent. Whether the monuments at Roughton and Hanworth represent a single complex, or two distinct but related sites, is not clear. At Springfield (Essex) and Bures (Suffolk), the complexes occupy sites in the middle reaches of their respective river systems (Buckley et al. 2001, 158). By contrast the Hanworth/Roughton complex is bounded by the headwaters of the River Bure. Further work by the NMP in other parts of the county could establish whether this pattern is widespread within Norfolk.

Although the major monuments of the area are (apparently) of Neolithic date, the significance of the locale as a funerary and ceremonial landscape continued well into the Bronze Age and perhaps beyond. This is particularly the case for the cursus complex, with isolated round barrows and cemeteries (some, perhaps, with Neolithic origins) visible within approximately 1km of the earlier monument in all directions. The high ground of Roughton Heath, 2km to the northeast, also became home to a large dispersed group of Bronze Age barrows. Fragments of a settlement, field systems and long-distance trackways, all probably of later Bronze Age or Iron Age date, are also visible as cropmarks across much of the area, the tradition of constructing funerary monuments continuing in the form of square barrows of Iron Age or Roman date. Whether such 'domestic' activities took place here in the Neolithic and earlier Bronze Age is not clear; at other funerary/ceremonial complexes in the county there is evidence to suggest that they were not wholly ritual landscapes (Ashwin 1996, 58).

## 5 Bronze Age (2350 – 701 BC)

### 5.1 Introduction

As with the preceding Neolithic period, the majority of the monuments attributed to the Bronze Age are related to funerary activities. Ashwin's 1996 synthesis of Neolithic and Bronze Age Norfolk highlighted the fact that one of the major problems with reaching any kind of understanding of the Bronze Age in Norfolk is the inability to recognise, from aerial photographic evidence, the enclosed settlements, field systems and land boundaries of the period, if these types of sites ever existed (Ashwin, 1996). The NMP mapping, combined with recent excavations on the line of the Bacton to Great Yarmouth pipeline by NAU Archaeology (NHER 33954 and 33959), has hopefully started to shed some light on many of these issues. At the very least it has provided a set of morphological characteristics for possible Bronze Age sites that now need to be further evaluated by excavation.

### 5.2 Barrows

The plough-levelled remains of round barrows, visible as ring ditches, were a common feature of the mapping in most areas. Several distinct concentrations were identified, in particular in the central and northeastern part of the Coastal Zone. A total of 373 sites containing one or more ring ditches of probable Bronze Age date were recorded within the Coastal Zone. Only ninety-one of these sites existed on the NHER prior to the NMP mapping, indicating that 282 new sites have been recorded. It must be noted, however, that some of the 'new' ring ditches are the product of the reclassification or renumbering of previously recorded multi-phase sites that included one or more ring ditches. The actual number of ring ditches mapped is considerably greater than the total number of sites, as approximately half of the 373 sites refer to more than one ring ditch, and twenty-six of the sites are recorded as being barrow cemeteries.

Although the majority of the ring ditches recorded were assumed to be the remains of round barrows, only fifty actual earthwork barrow sites were recorded within the Coastal Zone. These surviving earthworks are largely preserved on the extensive heaths of north Norfolk, as at Salthouse Heath, and within areas of woodland. In contrast to the large number of new ring ditches only fourteen potential new earthwork barrow sites were found. These were mainly identified within rough ground and gorse on the heaths at Salthouse, Kelling and Roughton. The earthworks recorded at seven of these possible new sites were identified on historic aerial photographs and have since been plough-levelled, as have four other barrow sites. Six possible new sites, however, all located on Salthouse and Kelling heaths, may still survive as earthworks. These identifications are at present only tentative: the problems caused by vegetation cover, combined with the presence of World War Two earthworks in close

proximity, has meant that the archaeological significance of these possible barrows is not currently known for certain. To date only one of the barrows has been proven to exist on the ground (NHER 6212).

The majority (c. 80%) of the ring ditches measure between 10m and 45m in diameter and this size range is consistent with national standards (Wilson 2000, 101). The ring ditches smaller than 10m may also represent barrows of possible Late Bronze Age, Iron Age or even Saxon date. Late Bronze Age cremations excavated on Salthouse Heath had been covered by small mounds, 3–5m in diameter, and it is therefore possible that some of these smaller ring ditches, in particular those located within larger Bronze Age cemeteries, may represent the remains of this type of barrow. A number of these smaller ring ditches are located within sites that include possible square barrows and it is therefore possible that some may represent Iron Age barrows (see Section 6.3 for discussion). The majority, however, of the small (<10m in diameter) ring ditches identified were recorded within an Iron Age to Roman settlement context and are therefore likely to represent the remains of round houses (see Section 7.1.2).

Although it has been assumed that the majority of ring ditches in the 10–45m range represent the remains of plough-levelled Bronze Age round barrows, recent excavations have revealed a number of ring ditches of this size to be much later and this must stand as a reminder of the potential pitfalls in interpreting such sites. Ring ditches visible on aerial photographs at Trowse, on the line of the Norwich Southern Bypass excavations (Ashwin & Bates 2000), were initially thought to be Bronze Age in date but turned out to be the remains of World War Two searchlights (NHER 9589). A ring ditch (NHER 16167) excavated at Hopton-on-Sea, located on the edge of a possible Bronze Age barrow cemetery (NHER 43527), may instead be the remains of a post medieval mill (Penn 2002).

A total of eleven ring ditches that exceeded 50m in diameter were recorded. The majority of these measure between 50m and 60m across and are still likely to represent broadly Bronze Age date barrows, although it is possible that some of them are Neolithic in date, following the pattern indicated by excavation in areas such as East Yorkshire (Stoertz 1997, 33). Although at present evidence for large barrows dating to the Neolithic in Norfolk is limited and these larger sites could represent extension and addition to the barrow mounds over time (Trevor Ashwin pers. comm.). The extremely large and elaborate ring ditches, those over 60m, could represent hengiform monuments and are discussed in Section 4.5. Many of these larger barrows appear to act as foci for later barrows, suggesting a relatively early date, although these could be Early Bronze Age and not necessarily Neolithic in date. The ring ditch of 50m diameter at Browston Hall, Belton with Browston (NHER 17225) sits in a group of three barrows, which is itself part of a chain of barrows located on the eastern side of a plateau defined by the 15m contour. The round barrows are all positioned on or near to this contour,

either on the plateau edge or valley side. The large barrow sits at the head of this linear group and may represent one of the earliest components of the cemetery.

It is interesting to note that the ring ditch at Browston has two internal features, a small kidney-shaped enclosure and a C-shaped ditch, which may relate to contemporary activity within the enclosure, perhaps associated with mortuary rites. Another large ring ditch, measuring 52m in diameter, recorded at Sedgeford (NHER 33599) also has a small rectangular enclosure at its centre, although it is not clear whether the two features are contemporary. The fact that the ring ditch is marked on a map of 1630 (Chris Mackie pers. comm.) could suggest that it is actually a later feature or else an earthwork barrow that was fossilised within the medieval field layout. It is possible that the internal features indicate that these large circular enclosures are in fact domestic, although their positioning within funerary contexts would not necessarily support that interpretation, (see Section 5.4 for a discussion of possible prehistoric circular settlement enclosures).

### **5.2.1 Distribution and Landscape Setting**

As has been mentioned above, the distribution of surviving or recently destroyed earthwork barrows reflects that of areas of heathland, woods and rough ground in the vicinity of the coast. This distribution reflects the fact that these poorer, podzolised soils were not taken into arable agriculture until recently (if at all) and therefore escaped the plough (Lawson et al. 1981, 56-8). Numerous cropmarks of other plough-levelled barrows and ring ditches can be seen surrounding the remaining heaths. Despite this bias, there is some evidence that the lightest soils, which were most susceptible to podzolisation, were preferred for siting barrows (Lawson et al. 1981, 63). An analysis of the distribution of ring ditches in relation to soil types was undertaken by Lawson in 1981, and this highlighted several themes: that there was a close correlation between ring ditches and the soils associated with the chalk scarp, that few ring ditches were located on the Greensands and sands and gravels, and that the coverloams of northeast and east Norfolk support the densest area of ring ditches (Lawson et al. 1981, 45).

Generally speaking, the NMP results (Figure 5.1) have followed most of the patterns identified by Lawson. Only a limited number of ring ditches have been recorded along the Greensand Belt of west Norfolk. The responsive cropmark formation conditions in this area would indicate that this distribution is reflecting an archaeological pattern rather than one caused by the nature of the aerial photographic evidence. A distribution map of various sites and finds dating to the Early Bronze Age also demonstrates a relative scarcity in this area (Ashwin 2005b, 20). The correlation between the chalk and the ring ditches can still be identified, with a particular concentration towards the western part of the chalk escarpment. A number of sites were

identified on gravels associated with the Cromer Ridge, in particular in the arable areas surrounding the remaining areas of heath. The greatest concentration of ring ditches was located on the coverloams of northeast and east Norfolk, with particular concentrations visible at Roughton, Witton, Flegg and north Lothingland. This is unsurprising given the light and freely draining soil conditions, which generally produce a good cropmark response, but it also coincides with noticeable concentrations of other types of prehistoric monuments. This would suggest that this distribution reflects both the favourable cropmark conditions and a human preference for these areas and soils.

The landscape contexts of the ring ditches and barrows suggest that a variety of topographic settings were selected for barrow sites and further analysis may reveal distinct regional trends. For the purposes of this report, however, only preliminary analysis of the landscape setting has taken place and additional analysis of topographic setting in the field would be required to form any detailed understandings of the setting of these monuments. The topography of Norfolk is relatively subtle compared to some other British counties, but the national trend for barrows to be placed at prominent and elevated locations can also be identified amongst the Norfolk sites. The majority of the sites are located on moderate slopes and often on valley sides, in particular overlooking the confluence of streams or the heads of valleys. Statistically it is the barrow cemeteries, rather than single barrows, that are more likely to be positioned on slight promontories or spurs and overlooking valleys systems. The central part of the dispersed linear cemetery at Fring (NHER 45008) is located on the northwest-facing slope of a small headland or spur of higher ground. This group overlooks the point at which a small dry valley divides to its northeast and south. A single ring ditch cropmark (NHER 43337), marking the southern limit of the cemetery, also lies at the head of the southern fork in the valley. Three single ring ditches are present to the north of the central group (NHER 12830 & 43346-7) and are located across the northeastern fork in the small valley. The northeastern valley fork divides again and has three small ring ditch cropmarks located at its northern limit (NHER 12831).

A linear group of barrows was also identified at Roughton (NHER 6738-40, 38632) (Fig. 5.2). This linear barrow group forms part of a much wider distribution of large round barrows straddling the ridge overlooking one of the upper tributaries of the River Bure. This positioning would potentially have visually skylined these monuments when viewed from the valley floor, which would have been a main routeway through the area. Field visits would be required to assess whether this would have been the case. This apparent landscape setting of barrows appears to be mirrored on the opposite side of the valley and others nearby. It is quite common for linear groups of barrows to be positioned on the contour along a valley side or just below a plateau, as described earlier with the Browston Hall group (NHER 17225).

It is important to note that there are a significant number of ring ditches and barrows that were positioned in more low-lying and even valley-floor locations. On the lower slopes of the



valleys and former estuaries of east Norfolk a number of ring ditches are positioned below the 5m contour. These are often positioned just above the margins of the fens and former estuaries, as at Hickling (NHER 29749 & 36106) and Filby Broad (NHER 27716 & 27650). During the earlier prehistoric periods the estuary, fens and freshwater lagoons would have provided a valuable resource for fishing, wildfowl exploitation and hunting, with many groups possibly still leading relatively mobile lifestyles. It is possible that these barrows positioned at the edge of this wetter and more marginal landscape played a role in the negotiation of and access to the fen resources.

The setting of the monuments in terms of the inhabited landscape also needs to be considered. Many of the barrow cemeteries, as shall be discussed below, are located at or near earlier monuments of Neolithic date, in particular monuments associated with communal mortuary or ceremonial activity. The barrows appear to be placed along routes of human movement and communication and possibly also on the edge of territories or marginal landscapes, as suggested for the fen-edge sites. It must be noted that excavations in Norfolk in the last twenty years have revealed some limited evidence for barrows being constructed directly on top of earlier occupation sites (Ashwin 1996, 51). As shall be discussed later, barrows themselves become focal points in the landscape, with trackways, fields and possibly settlements being located alongside them.

### **5.3 Barrow Cemeteries**

The development of barrow cemeteries demonstrates a desire to connect both with a particular place, but also with an ancestral lineage or narrative. A total of twenty-six barrow cemeteries were recorded within the Coastal Zone. Most of these had less than eight components, however three sites stood out in terms of size. NHER 43526 at Hopton-on-Sea had sixteen smaller barrows, which were clearly focused upon a larger and probably Neolithic barrow with an enormous encircling ditch measuring 80m in diameter (see below for discussion). Another of the large cemeteries, the linear group at Fring (NHER 45008), represented a more dispersed arrangement of barrows. Here fourteen ring ditches or barrows form a roughly north-to-south aligned linear plan extending for 1.23km. The largest cemetery within the Coastal Zone is at Salthouse Heath (NHER 38629), where over sixty barrows have been recorded, potentially spanning the Late Neolithic to the Late Bronze Age, many of which survive as earthworks (see Case Study II for details).

As mentioned briefly above, many of the Bronze Age cemeteries possibly develop around Late Neolithic or Early Bronze Age barrows or hengiform monuments. This pattern of development is common and has been identified elsewhere (Brown et al. 2002, 17-18). At some sites the later and smaller barrows are positioned like satellites around a central focus, as at Roughton where three relatively small ring ditches cluster around a larger hengiform ring ditch measuring 60m in diameter (NHER 36477-9 & 38500; Fig. 5.3).

The Bronze Age cemetery at Hopton-on-Sea (NHER 43526), discussed earlier, also appears to develop around two earlier monuments of potential Late Neolithic to Early Bronze Age date (Fig. 5.4). The large size of the internal mound, 30m across, and almost henge-like dimensions of the 80m ring ditch, could indicate that this barrow is Neolithic in date. This immense monument appears to have acted as a focus for a later cemetery of sixteen smaller barrows, which range in diameter from 12m to 19m. It is possible that these smaller barrows are Middle Bronze Age in date, although an Early Bronze Age date is also possible. Eight of the rings form a linear arrangement running for 350m. This line of barrows appears to link the large eastern barrow with another relatively large concentric ring ditch at the western end of the cemetery. The cropmarks show two full rings, 24m and 31m in diameter, plus traces of a third outer ring around the southern side of the monument. A small C-shaped ditch, 15m long, is located to the north of this monument and may represent a small funerary enclosure of the type discussed in Section 4.5. This western cluster of four ring ditches is separated from the main group to the east by the shallow end of the Fritton valley. It is possible that this group may have formed a separate cemetery to that on the eastern side of the valley, although they appear to follow the same roughly linear arrangement. Another barrow group is located to the south (NHER 43527) within which two groups are separated by the narrow and shallow end of the Fritton Valley, which forks in two directions at Hopton House.

#### **Case Study II: Salthouse Heath Cemetery (NHER 38629)**

The barrow cemetery at Salthouse Heath, centred on TF 0733 4213, probably represents the largest barrow group recorded in Norfolk (Fig. 5.5). The dispersed cemetery covers approximately 1.6km by 1.2km. The mapping has also revealed the soilmarks and cropmarks of former barrow sites on the arable land that now surrounds the heath. Many of these sites are consistent with former barrows known from antiquarian records and plans, which have since been destroyed by the plough (Lawson et al. 1981, pl. xi). The surviving earthworks include two extremely large embanked barrows, disc barrows and a linear barrow cemetery. A number of these barrows have been excavated, and the results, combined with the NMP mapping, can be used to reconstruct the development of the cemetery.

The main area of the cemetery is located on an elevated plateau of the Cromer Ridge, just to the south of an area of higher ground, which overlooks the coast. Only two barrows actually sit on this higher ground, which slopes very gently to the south. Despite the panoramic views available over the coastal plain to the north, the focus of the cemetery appears to be directed to the south, towards a network of river valleys. Several possible Neolithic monuments have also been identified to the south of this area (NHER 27172 & 36398), suggesting that the positioning of the round barrow cemetery was drawing upon the existing history of the place. However, it must be noted that the main focus of the cemetery is slightly removed from the

Neolithic monuments and therefore may represent a shift away from these earlier sites and associated traditions and practices.

The barrow cemetery at Salthouse appears to have developed very gradually over nearly 2000 years. It is possible that some of the large and elaborate barrows within the cemetery have Late Neolithic origins. The recovery of fragments of Beaker pottery within the barrow on Three Farthing Hill (NHER 6203) could indicate a later Neolithic date, however the stratigraphic context and significance of these finds is uncertain (Trevor Ashwin pers. comm.). A collared urn of an Early Bronze Age type has also been found 'near the surface' of the large embanked bowl barrow at Three Halfpenny Hill (NHER 6202). This may suggest an Early Bronze Age date of the monument or alternatively it is possible that this represents a secondary internment within an earlier barrow. Late Neolithic to Early Bronze Age material (NHER 6227) has also been found close to the Gallows Hill barrow group (NHER 6201) on the eastern edge of the cemetery and is thought to have come from the one of the barrows. The Gallows Hill group forms a nucleated cluster within the more dispersed cemetery. The main focus is a large bowl barrow, the mound measuring 25–27m in diameter. To the immediate south of this large barrow are eight smaller barrows arranged in two rows. A tenth barrow, cut by the road, was possibly also visible on the aerial photographs, although checking on the ground has not identified any satisfactory sign of the mound. These smaller barrows range in size from 13m to 16.5m in diameter and are likely to be Middle Bronze Age in date. However, it must be noted that Iron Age pottery has been found in association with the site (NHER 6201).

The coarse bucket urns found associated with barrows within the western part of the cemetery could also indicate its use in the Middle Bronze Age (NHER 6212) (Lawson et al. 1981, 39). This part of the cemetery certainly continues in use into the Late Bronze Age, as it becomes the focus for a cremation cemetery, with at least thirty small, closely spaced barrows being constructed. These later mounds measure approximately 0.3m high and 3–5m in diameter, and were located in the 1930s in the area of NHER 6212 (Lawson et al. 1981, 39). Several have been excavated and were found to contain cremations within vessels described as 'degenerate bucket urns' of Late Bronze Age date (ibid.). Fieldwork by Ray Loveday continues to locate further examples of these small and ephemeral barrows on the heath (NHER 6212). Cremation or bucket urns were also inserted into the mounds of the earlier round barrows during this period. The development of this cemetery reveals a constant reworking and negotiation of ancestral relationships, both real and aspirational.

#### **5.4 Enclosures and Settlement**

The identification of domestic sites dating to the Bronze Age was much more problematic than the funerary evidence. There are no excavated or securely dated examples of enclosed settlement from Norfolk to provide an indicator of the likely morphology or characteristics and

it is possible sites of that type did not develop in Norfolk during this period. The majority of evidence for Bronze Age domestic activity in Norfolk suggests open settlement and is characterised by clusters of pits and working areas. Although possible traces of circular post-built structures have been identified during excavations, evidence for actual Bronze Age settlement structures is scarce in Norfolk (Ashwin 2005b, 21). In the Neolithic and Bronze Age synthesis produced in 1997 for the Regional Archaeological Research Framework (Brown & Murphy 1997), Norfolk was characterised as having only sparse evidence of Neolithic and Bronze Age occupation, in contrast to the other Eastern Counties. As recently as 2005 it was felt that Bronze Age settlements and major land divisions were still elusive in Norfolk (Ashwin 2005b).

In other East Anglian counties, and elsewhere in Britain, there is a growing body of evidence of enclosed Bronze Age landscapes and settlements. Extensive excavations at Fengate (Cambridgeshire) have revealed Late Neolithic and Bronze Age settlement and field systems. The settlement consisted of two sub-rectangular fields or enclosures, associated with a droveway. Occupation during the later part of the period was associated with a circular enclosure measuring 25m across (Pryor 1976). Late Neolithic domestic structures have also been excavated within a circular hengiform enclosure measuring approximately 40m across at Lawford in Essex (Priddy & Buckley n.d., 10), and Late Neolithic to Early Bronze Age settlement and fields have been revealed at Sutton Hoo (Copp 1989; Hummler 1993). At Fengate during the Middle Bronze Age the site developed into a series of rectangular and coaxial field boundaries and enclosures, defined by double ditches and trackways (Pryor 1980). A Middle Bronze Age rectangular field system was also identified at Mucking, Essex (Jones & Bond 1980, 471). Several enclosed Late Bronze Age settlements have been excavated in Essex, including a double-ditched sub-rectangular enclosure, 48m across, at Lofts Farm (Brown 1988), a circular defended enclosure, 60m across, at Springfield Lyons, and the large double-ditched circular hengiform enclosure, 83m across, at Mucking, South Rings, which overlies part of the Middle Bronze Age field system (Jones & Bond 1980, 471). At Game Farm, Brandon, on the Norfolk/Suffolk border, excavations revealed a series of roundhouses dispersed throughout a complex field system and stock enclosures dating to the Middle to Late Bronze Age (Gibson 2004, 52-6). The excavation suggested four possible phases of boundary creation or recutting events, which eventually formed a grid-like system of fields and enclosures (ibid. 53).

This therefore indicates that within East Anglia a significant number of late prehistoric and Bronze Age settlements were being enclosed by ditches. There is, however, no obvious regional trend with regard to the morphology of these enclosures; for example, during the Late Bronze Age in Essex both circular and rectangular enclosures are common. This means that there is not a characteristic Bronze Age enclosure type against which to compare the NMP mapping and, as stated above, Norfolk at present stands out within East Anglia as being

the only county with no known enclosed settlements or field systems. As a result the dating of any of the cropmark enclosures to the Bronze Age, as presented in the following section, is at best tentative and relies heavily on extremely limited excavation results, associated finds and more often on morphological analogy with other possible East Anglian examples. Despite these severe limitations and potential pitfalls, the identification of the possible Bronze Age enclosures and field systems discussed below still potentially represents extremely significant advances in our knowledge of this period.

#### **5.4.1 Cropmark Enclosures of Possible Bronze Age Date**

Out of the ninety-seven enclosures given a probable late prehistoric date, only eleven appear to represent potential domestic sites of possible Bronze Age date (Fig. 5.6). The majority of the remainder are likely to be Iron Age or to have had a funerary function. Only two of the eleven sites have visible evidence of possible internal round houses (NHER 27240 & 33526), although two other sites (NHER 29753 and 12828) have penannular ring ditches (of a relatively small size range) in close proximity to the enclosure. In the absence of internal features the majority of the sites have been interpreted as domestic enclosures, farmsteads or small settlements, based on the appearance of the enclosure ditches. Many of the sites have a well-defined and clearly demarcated enclosure boundary and, with the exception of the Witton enclosure (NHER 29753), this boundary is of greater width than would be expected around an agricultural field or paddock.

The majority of these eleven enclosures have no dating evidence and have been assigned a Bronze Age date on grounds of either morphology or their relationship with other sites, in particular those which appear to form earlier components of Iron Age sites. Only one of the enclosures, at Witton (NHER 29753), has been dated to the Late Bronze Age through excavation, but it is still possible that the Bronze Age material was residual. The ditches of an enclosure at Nova Scotia Farm (NHER 12828) contained quantities of worked flints and the enclosure was associated with a field system of possible Middle Bronze Age date (see Case Study III). Two of the enclosures (Heacham, NHER 13032 & Hopton-on-Sea, NHER 43500) have been interpreted as being of possible Bronze Age date due to their relationship with features dating to the later Iron Age, although a Middle Iron Age date is also possible. In both cases the enclosures, or parts of them, appear to have been incorporated into later field systems and enclosure complexes. Three others (NHER 27240, 27331 & 27337) have been interpreted as being Bronze Age as they appear to be associated with, or broadly contemporary with, other known Bronze Age sites or finds scatters. This discussion aims to highlight a potentially hitherto unrecognised body of Bronze Age settlement evidence, however further investigation and excavation is essential before any of these interpretations and suggested chronologies can be taken further.

### 5.4.2 Enclosure Characteristics

The enclosures that have been interpreted as being possibly Bronze Age in date exhibit a variety of different features (Fig. 5.6), but a number of broad characteristics can be identified. The majority of the sites are polygonal or trapezoidal in shape and many also incorporate curvilinear elements. An irregular or asymmetric shape is common, as is an irregular outline to the enclosure ditches. Half of the enclosures are noticeably larger in size than the remainder of the group, measuring in excess of 70m across. It is worth noting that the more irregular enclosures are the largest. This may reflect a different function or perhaps a different date. However a number of the enclosures are quite small and sub-rectangular in shape. These are also associated with regular and coaxial field systems and trackways. Generally these are characteristics that would more normally be attributed to Iron Age to Roman enclosures, although this may also be due to a lack of knowledge of the potential characteristics of Bronze Age fields in Norfolk (see Section 5.5). It could be the case that these more regular enclosures have been misinterpreted, but it is interesting to note that the three enclosures that have been associated with Bronze Age material, either directly or indirectly, are also the sites that exhibit the more regular plans. These fields and enclosures compare well with the coaxial fields and enclosures at Fengate and the double-ditched rectangular enclosure at Lofts Farm. It is therefore possible that many of the other rectilinear enclosures identified from aerial photographs may also have Bronze Age origins.

The majority of the sites are located on slight slopes of varying aspects. With the exception of two sites (NHER 13032 & 33526) all of the enclosures are located on the light and freely draining loamy soils of the northeastern part of the Coastal Zone. This would have represented prime agricultural land and appears to have had a general concentration of many types of prehistoric monument, although, as discussed in Section 3.5, this may also be a reflection of the favourable cropmark conditions in this part of Norfolk. The preference for lighter soils in the later part of the Bronze Age is not necessarily reflected in the distribution of finds for this period, as it is characterised by a dispersal away from the lighter soils and river valleys and onto the clays (Ashwin 2005b, 19-20).

A high proportion of these enclosures are associated with extensive field systems, although at most of the sites the dates of the field system are also unknown and it is possible that the enclosures pre-date them. At two sites (NHER 12828 & 27337) the origin of the fields themselves can potentially be pushed back to the Middle Bronze Age. (See Section 5.5 for a full discussion of these field systems.) Three of the sites appear to be closely related to trackways (NHER 29753, 45225 & 43500), which have also been interpreted as being late prehistoric in date (Section 5.5.1). Another common association is with ring ditches and round barrows. The large enclosure at Letheringsett (NHER 33526) is located on the western edge of the large barrow cemetery on Salthouse Heath (Case Study II). Seven of the sites are located in close proximity to cropmarks of former round barrows and excavated evidence of

funerary activity. This kind of physical relationship between secular and funerary sites is not unusual in the Middle and Late Bronze Age (Bradley 1998, 150; Woodward 2000, 49-72), an example being South Lodge on Cranborne Chase (Barrett et al. 1991, 146-7).

#### **5.4.3 Late Prehistoric Circular and Curvilinear Enclosures**

A number of curvilinear and circular enclosures of potential late prehistoric date were mapped (Fig. 5.7), although at present no dating evidence exists to suggest a specific period, apart from two enclosures which may in fact be post medieval in date. The enclosures can be characterised by their curvilinear outline, and all measure at least 55m across. Six possible sites stand out amongst the many possible circular and curvilinear enclosures mapped as being possible settlement sites, although at least two of these six, NHER 33599 and 36398, may not be domestic in nature. The Sedgeford enclosure (NHER 33599), with its central rectangular structure, has already been discussed with reference to barrows and may in fact be post medieval in date. The circular enclosure at Salthouse (NHER 36398), described in Section 4.2, may have more in common with the Neolithic causewayed enclosure tradition. However it is worth noting the similarities in plan between this site and the Late Bronze Age defended settlement enclosure at Springfield Lyons, Essex. The enclosures are both 60m across and constructed with a causewayed ditch and internal banks. However there are two noticeable differences between the plans of the two sites: the ditches of the Salthouse site are quite narrow and the ditch segments are quite short when compared to the enclosing defences at Springfield Lyons. While it is possible that the Salthouse enclosure also represents an enclosed settlement, there is to date no evidence to suggest this and the context of the site would appear to be funerary or ceremonial, rather than domestic.

The remaining four enclosures are all 75–85m across and are circular or sub-circular in shape. One of these has an internal rectangular enclosure conjoined to the enclosure ditch (NHER 26687). No other internal features were noted at the other sites. Two of these sites (NHER 26687 & 26940) are located in close proximity to one another, 170m apart, and are located within Hunstanton Park (Fig. 10.11). It remains a possibility that these enclosures relate to post medieval park features. Unfortunately none of the 18th-century maps reproduced by Williamson (1998, 124) covers this area of the park. It is worth noting that these enclosures are quite close to a number of Bronze Age metalwork finds and flintworking sites, and 2km to the north of the prehistoric site at Redgate Hill (NHER 1396) which revealed evidence for Neolithic to Bronze Age settlement, including possible structural remains and round houses.

A semi-circular enclosure at Burnham Market (NHER 27002) is located to the immediate south of several large multi-period finds scatters (NHER 25918, 29185 & 29624), all of which include some prehistoric pottery. The site is also located approximately 500m from a group of round barrows and a possible hengiform monument (NHER 1020). The possible sub-circular

enclosure identified at Sustead (NHER 38658) also lies in an area of known prehistoric ceremonial and funerary activity. The cropmark of the Sustead enclosure is, however, rather narrow and faint, and it is also visible on only one set of vertical aerial photographs. There is a possibility, therefore, that it is a geological rather than an archaeological feature. Three other enclosures were identified at East Ruston (NHER 38728 & 38714) and at Sustead (NHER 38660). These were much smaller than the other enclosures within this category, but had some shared characteristics. It seems likely that these may also relate to late prehistoric settlement or activity of some sort.

## **5.5 Field Systems and Trackways**

Coaxial field systems of Bronze Age date are well attested in other parts of the country – the Dartmoor Reaves, for example, and at Fengate. The recent excavations at Brandon (see section 5.4) attest to the existence of Middle to Late Bronze Age rectilinear fields and stock enclosures on the Norfolk/Suffolk border (Gibson, 2004). The NMP mapping has revealed huge swathes of fragmentary field systems within the Coastal Zone, the majority of which are located over the light loamy soils and gravels of northeast Norfolk and to a lesser extent on the Greensands of west Norfolk. Without additional chronological information nearly all of these field systems have been interpreted as being of probable late prehistoric date, more specifically Iron Age to Roman (see Chapter 7). However comparison of some the NMP mapping and recent results of excavations undertaken by the NAU has revealed some surprising findings and may shed new light on the possible presence and character of Bronze Age field systems in Norfolk, in particular in the northeast of the county.

The two field systems with almost certain Bronze Age origins are within 2.5km of one another at Hemsby (NHER 27338) (Fig. 5.10) and at Nova Scotia Farm, Ormesby St Margaret (NHER 12828) in northeast Norfolk (Fig. 5.9). Another field system at Martham (NHER 27331) is associated with Bronze Age finds (Fig. 5.8), although the relationship between the cropmarks and the finds has not been securely established. All three sites have been mentioned in association with the enclosures discussed in Section 5.4, and are located on the same light, free-draining soils of this part of Norfolk. Both excavated sites lie on the route of the Bacton to Great Yarmouth gas pipeline and were targeted for archaeological excavation by NAU in 1999 (Bates & Crowson 2004; Bates in prep.). The pipeline excavations have provided valuable dating evidence for a small sample of these areas. The dating of some elements of the field systems to the Bronze Age is significant and may suggest that further examples are present. Further excavation on similar large field system complexes would be needed to establish whether these examples reflect a general trend towards an early date for the establishment of many of these field systems and boundaries. It is worth noting that significant numbers of surface finds of lithics were associated with the field system at Nova Scotia Farm (Bates and Crowson, 2004, 18) and could provide an indicator of a potentially early date to other cropmark field systems.



### **Case Study III: Nova Scotia Farm (NHER 12828)**

The cropmarks at Nova Scotia Farm (NHER 12828) at Ormesby St Margaret (Site 10 on Bacton to Great Yarmouth pipeline route) represent a massive, multi-phase field system and enclosure complex that extends for over 1000m by 880m and is dominated by ditches on southwest-to-northeast and northwest-to-southeast alignments (Fig. 5.9). The majority of the ditches on these alignments appear to be part of a fragmentary coaxial field system. The field system continues to the immediate south (recorded under NHER 12996) and here the coaxial plan can be seen much more clearly, as it has not been overlain by seemingly later or obtrusive elements. The field boundaries are extremely straight and regular and divide the land into neat rectangular and square parcels of varying sizes, although 100m by 60m is a relatively common dimension. A number of trackways and double-ditched boundaries are visible running in between different enclosures (Fig. 5.9).

The southeastern part of the cropmark complex contains a number of smaller and less regular fields and enclosures. However, their overall alignment is similar to that of the coaxial field system and they are likely to be contemporary with it. Ditches defining a group of small fields at TG 5054 1342 and TG 5055 1340 contained Middle Bronze Age pottery and flints when excavated in advance of the gas pipeline (Bates & Crowson 2004, 18, 30). Comparison of the NMP mapping and excavation plans would indicate that the boundaries dating to the Bronze Age have a wider and more irregular appearance than the surrounding straight and narrow ditches. This noticeable difference in the appearance of the ditches may indicate that these boundaries, plus the polygonal enclosure (Fig. 5.6 & 5.9) are of a different date to much of the surrounding field system. However it is important to note that these Bronze Age field boundaries follow the same alignment as the rest of the coaxial fields. To the north is another broader ditched and curvilinear boundary that appears to form another early component of the field system. It is probable that this is another Bronze Age boundary that has persisted. Some of the field boundaries respect it, whilst others cut across it. The western end appears to be incorporated into the field system, whilst a rectangular enclosure of probable Iron Age to Roman date overlies the eastern end (see Section 7.1.2). Three ring ditches, almost certainly the remains of Bronze Age barrows, are located within the field system (NHER 27605-7). The boundaries associated with this phase of the field system do not cross the barrows. This may suggest that the field system was established around the barrows, and these land divisions formalised existing understandings of the landscape, previously negotiated through the siting of barrows. A similar relationship was identified between barrows and the Middle Bronze Age field system at Mucking (Jones & Bond 1980, 471).

It is likely that many of the boundaries of the coaxial field system post-date the Bronze Age. These earlier ditches, however, obviously played an important role in the structuring of the later landscape and many appear to have continued in use for a significant period. The dominant alignment expressed by the fields continues over several kilometres of fragmentary

fields (NHER 12997), many elements of which represent relatively long-distance boundaries. This suggests a possible marking out of the land in the Middle to Late Bronze Age period and indicates that these boundaries persisted and continued to evolve. This possible structuring of the later prehistoric and early Roman landscape is also possibly suggested by cropmark and excavation evidence at Witton (NHER 29753). Here, an enclosure (Fig. 5.6), and possibly also an associated long-distance boundary, have been tentatively dated to the Late Bronze Age period. Their alignment appears to be reflected in the surrounding fields and trackways, suggesting again that the later prehistoric fields were established around earlier Bronze Age features.

#### **Case Study IV: Hemsby (NHER 27338)**

The other possible Bronze Age field system identified during NMP and the Bacton to Great Yarmouth pipeline excavations is at Hemsby (NHER 27338) (Fig. 5.10). The field system forms part of a larger cropmark complex (NHER 27259) comprising field systems, enclosures and trackways of various dates. Excavation at Site 7N on the pipeline route recovered small quantities of Bronze Age pottery from part of the field system described here and from other nearby features (NHER 12165; Bates & Crowson 2004; Sarah Bates (NAU), pers. comm.). Worked flint characteristic of the Late Neolithic to Early Bronze Age was also recovered from the site. In places, it was demonstrated that the features thought to be Bronze Age were stratigraphically earlier than parts of a second field system of probable Iron Age to Roman date (NHER 27339).

The postulated field system appears to have been laid out around a pre-existing round barrow cemetery (NHER 27342) and in places it appears to deliberately incorporate these earlier features, such as diverting around ring ditches (NHER 27343 & NHER 27348). Its principal element is a wide, braided and re-cut ditch which follows a rather irregular course and runs along the middle of a low spur, surrounded by lower ground to its north, west and south. It may have acted as a drainage ditch as it was observed during the excavation that it was permanently filled with water. Its size would suggest that it acted as a significant boundary. Numerous narrower ditches come off this central feature at irregular angles, meeting other elements to form a characteristically random group of fields, boundary ditches and trackways. Overall, the site has the appearance of having developed over a lengthy period of time, perhaps comprising several different phases of construction and disuse. Its irregular morphology and plan are in distinct contrast to the later, more regular field system that overlies it (NHER 27339).

Although the Hemsby field system has markedly different characteristics to the more regular and coaxial fields at Ormesby (see Case Study III above), the pronounced irregularity of the field boundaries at both sites could be seen to be characteristic. This trait has already been identified as being typical of the enclosures thought to date to this period. This irregular

appearance is also common with the trackways that have been interpreted as being late prehistoric in date, the irregular and braided ditches being caused by the recutting of the tracks over time.

### **5.5.1 Long-Distance Trackways and Boundaries**

A total of 126 trackways of probable prehistoric date were identified within the Coastal Zone, although many of these are associated with settlement and fields of Iron Age and Roman date. However, a number of possible major long-distance trackways or boundaries of an earlier date have also been identified. The most significant group of trackways was identified at Hopton-on-Sea (NHER 43529 and 43544), where a system of several long-distance tracks was recorded (Fig. 5.11). The group consists of up to six long-distance trackways or boundaries, three of which are likely to originally have been part of the same linear feature. The trackways form two groups, 1.6km apart, and appear to represent quite early features in the landscape. A later Bronze Age or Early Iron Age date seems most likely. These features compare well other examples known from Lincolnshire and East Yorkshire where a Late Bronze Age date has been established through excavation for some examples (Boutwood 1998, 37-39; Stoertz 1997, 40).

#### **Case Study V: Hopton-on-Sea**

Norfolk Archaeological Unit excavated small sections of one of the trackways (NHER 11788) in 1998–9, but a definite date for the feature was not established. The inclusion of a Beaker sherd within the same fill as Iron Age pottery has led to some suspicion that these finds may be residual and do not accurately date the trackway (Timms & Ashwin 1999, 9). A considerable amount of Bronze Age material has been recovered near to the trackway (NHER 11788). Additionally, fieldwalking and excavations to the immediate west have revealed later Neolithic and Bronze Age activity, possibly indicating an area of open settlement, although the nature of this is not clear as the assemblages were considered to be more representative of structured deposition rather than typical 'domestic' refuse (Timms & Ashwin 1999, 17).

The excavation clearly illustrated that the ditches of the trackway had been recut and potentially represented a long history of use. The trackway runs for approximately 1km and varies in width from 13m to 29m. The width of the ditches themselves also varies considerably from approximately 1m to 4m. The trackway follows a sinuous course and is defined by two parallel ditches for most of its recorded length, although some sections appear to be marked by interrupted ditch segments and pits (Fig 5.11). The excavation evidence suggests that these may be earlier than the ditches (see below) and may indicate that the trackway was in places originally defined by a pit alignment rather than a continuous ditch.

The trackway runs across a slight plateau, with the land gently sloping down to the southwest towards the Fritton Valley. The trackway appears to head towards a former river valley, which ran southwest-northeast across the area to the south. The course of the former channel is clearly visible on the aerial photographs. The southern part of this trackway appears to have been incorporated into an Iron Age to early Roman settlement and field system (NHER 43494). Another sinuous trackway is visible to the south (NHER 43501) and it is possible that the two trackways were originally part of the same network (the potential point of convergence is obscured by modern A12 road). The course of this southern trackway mirrors that of the more substantial northern linear feature: both have an almost S-shaped route.

The other sinuous long-distance trackway (NHER 43544), located approximately 1.6km to the west of this group, has very similar characteristics. The trackway runs for a total of 1.5km and varies in width from 4m to 15m. The character of the trackway changes along its entire length (Fig. 5.11). Continuous double ditches define the eastern end. The remainder of the trackway is defined by causewayed sections of ditch or elongated pits, often linked by a narrow ditch. In the central section continuous double ditches are often interspersed with a broad hollow-way. Towards the northwestern end of the trackway some sections appear to be entirely formed by a pit alignment. The track runs along the southeastern edge of a plateau of land defined by the 15m contour and crosses the far ends of the minor branches of the Fritton Valley.

Both these long-distance tracks appear to be sited upon Bronze Age round barrows. This part of Lothingland has produced masses of cropmark evidence for Bronze Age barrows, including two major cemeteries to the south (NHER 43526-7). The northern part of the eastern trackway (NHER 43529) appears to run in between a possible Bronze Age barrow group (NHER 43551). The course of the trackway also runs past a number of potential Bronze Age barrows (NHER 43516 & 43552-3). The western trackway (NHER 43544) also appears to run alongside a large and dispersed group of Bronze Age round barrows (NHER 45168-72) and in between another major barrow group (NHER 17225). This indicates that the trackway is later than the barrows, but may potentially still be Bronze Age or Early Iron Age in date. These trackways appear to be dividing the landscape of the former island or peninsula of Lothingland, from which coastal and marshland resources would be easily accessible, and which also possessed light and free-draining soils. The siting of these trackways upon the earlier monuments would potentially have drawn on existing understandings of territory and ancestry associated with the burial mounds. It is interesting to note that a cluster of Late Bronze Age metalwork finds are recorded in this part of Lothingland (Ashwin 2005b, 19-20).

## 6 Iron Age (800 BC – AD 42)

### 6.1 Introduction

The Iron Age in Norfolk is best known for its impressive metal finds, such as torcs, coins and terrets, and for a number of exceptional sites, namely hillforts and the large ritual complex at Fison Way, Thetford (NHER 5853). It is also commonly understood in terms of being the tribal home of the Iceni and Boudicca. To date, little evidence relating to settlement and agriculture has been recorded in the county; this has begun to be altered, however, through the ongoing results of developer-funded archaeological work. Unfortunately, the NMP has been unable to contribute much to the growing number of known Iron Age settlements, as few of the sites mapped by the project can be dated specifically to the Iron Age or Roman periods. They are therefore discussed in a more general chapter covering both periods (Chapter 7 below).

The possibility that substantial remnants of Iron Age coaxial field systems survive within Norfolk has been suggested for several areas, most famously the area around Scole and Dickleburgh in the south of the county (Williamson 1987). However, the extent to which these actually relate to Iron Age field systems is debatable (a summary of the argument is provided in Section 7.2). It is likely that many of the coaxial and rectilinear field systems mapped from aerial photographs within the Coastal Zone originated in the Iron Age, and possibly earlier (see Section 5.5), although this is hard to establish from the aerial photographic evidence alone, and these sites are again discussed more generally in Chapter 7. It has been suggested that a number of major linear earthworks in Norfolk also date to this period (Davies 1996, 75-77, Ashwin & Flitcroft 1999). No definite evidence of such features was recorded by the Coastal Zone NMP, although the long-distance trackways discussed in Section 5.5.1 may well be Iron Age in date. Part of a possible multi-ditched boundary, comparable to those identified in Lincolnshire (Boutwood 1998) and on the Yorkshire Wolds (Stoertz 1997, fig. 43 n. 11), was mapped at Gimingham in northeast Norfolk (NHER 31746) but its date and interpretation are far from certain. A number of possible Iron Age square barrows or square-ditched funerary enclosures have also been identified, but without further evidence it is impossible to draw any definite conclusions as to their date and function; they are discussed in detail in Section 6.3.

Two enclosures were recorded within the Coastal Zone that have comparable plans to the rectangular multiple-ditched ritual complex at Fison Way (NHER 5853), although this site is quite exceptional, and therefore it may be unlikely that three sites are necessarily of a comparable nature or function. Also, as discussed below, the interpretation of both of these sites is not certain. A triple-ditched rectangular enclosure at Burnham Thorpe (NHER 1788) measuring 125m by at least 110m has some morphological similarities to the Fison Way site.

The possible presence of a Roman barrow within the centre of this enclosure, as was suggested by an antiquarian excavation, could indicate that this is a ritual or funerary site (Lawson et al. 1981, 25), but the dating and archaeological significance of the mound are not certain. It is also possible that the ditched enclosure may pre-date the mound. Another possible multiple-ditched enclosure was mapped on a small hill at Sedgeford, West Norfolk (NHER 18237). This enclosure, approximately 260m by 190m, appears to be defined by up to six parallel ditches, but as it is located on the edge of the chalk escarpment, it is possible that some of the dark bands, interpreted as internal ditches, are geological in origin. Similar geological cropmarks were identified on the escarpment edge to the south. The outer ditches of the enclosure are extremely broad and appear to link up with medieval to post medieval boundaries, which formed part of the open field system depicted on the 1630 Le Strange Estate map. The interior of the enclosure is marked as a close or enclosed area within the strip fields and it is likely given the topography that it represents a small wood or area of pasture. It has been suggested that this parcel of land has been kept separate from the open fields due to the presence of earlier earthworks, perhaps relating a large Iron Age enclosure (Chris Mackie, Sedgeford Historical and Archaeological Research Project, pers. comm.), although without further archaeological evidence the significance of the site must be regarded as uncertain.

## **6.2 Settlement**

The character of Iron Age settlement in East Anglia as a whole is poorly understood when compared to other regions, such as Wessex and the Thames Valley (Bryant 2000, 14). It has been suggested that for much of the period a preference for unenclosed settlements and the apparent location of a significant number of sites on clay soils has resulted in an inability to detect these sites from the air in East Anglia (*ibid.*). The extent to which this pattern can be applied to Norfolk is unclear, as the clays do not appear to have been extensively utilised during much of the Iron Age (see below). There is also a relative paucity of excavated Iron Age sites in Norfolk, other than the large hillforts, or unusual sites such as the ritual complex at Fison Way, Thetford (NHER 5853). Consequently, our understanding of Iron Age domestic sites is limited (Ashwin 1999, 105). Those sites that have been fortuitously encountered during developer-funded archaeological work have suggested that the character of settlement during this period varies and that both enclosed and unenclosed settlements existed (*ibid.*, 119). An enclosed occupation site dating to the Early Iron Age has been excavated at West Harling (NHER 6019). The site consisted of two circular embanked enclosures, each approximately 40m in diameter and each surrounding a post-built round house (*ibid.*, 109). Excavations at Trowse, near Norwich (NHER 9589), revealed a series of Early to Middle Iron Age ditched enclosures, field boundaries and numerous pit clusters, suggesting occupation (Ashwin 1999, 112-3; Ashwin & Bates 2000, 159-169, 186-190).

Much of our current understanding of Iron Age settlement is constructed from the analysis of finds distributions. On the basis of this evidence it has been suggested that there is an Early Iron Age concentration of activity in the west of the county, especially on the Fen edge and the lighter, sandier soils of Breckland and the Greensand Belt (Davies 1999, 18). Dense settlement is suggested for west Norfolk in the Middle Iron Age, spreading out to the east but still avoiding the heavier soils. A significant increase in population has been suggested for the Late Iron Age, with many more known settlement sites, some located on the heavier clay soils of central and southern Norfolk (*ibid.*). It must be noted, however, that much of this hypothesis is based on the distribution of metalwork, and the extent to which material from possible structured deposits reflects actual settlement patterns is questionable. The number of actual excavated settlement sites is quite low, but nevertheless these do tend up to uphold the general pattern (Ashwin 1999, 117).

### **6.2.1 Defended Sites**

There are five known Iron Age defended or fortified sites in west Norfolk and two of these, Holkham (NHER 1776) and Warham (NHER 1828), are located within the NMP's Coastal Zone. These have in the past been referred to as 'hillforts', although only one of the Norfolk forts can be described as having a hilltop location: that at South Creake (NHER 1910), which lies just outside the Coastal Zone. The majority are located within river valleys or in low-lying marshy locations (Hutcheson & Ashwin 2005, 25); both of the coastal forts are positioned below the 15m contour. It has been noted that most of the Norfolk fortified sites are located at the boundary between the lighter, free-draining soils of the west and the heavier clay soils of central and southern Norfolk (Davies 1999, 30). Evidence of actual occupation within the enclosures is limited and comparable sites in Essex and Cambridgeshire have also produced little evidence for permanent internal settlement (*ibid.*, 32).

The fort at Bloodgate Hill, South Creake (NHER 1910) has recently been evaluated by NAU (Penn 2004). The site is almost entirely levelled although the ramparts are clearly visible on aerial photographs. A single massive circular bank and ditch defines the hillfort, which dates to around 280 BC, although there is evidence of it being re-cut (*ibid.*). A large ring ditch visible at the centre of the site has been variously interpreted as a Bronze Age round barrow or an Iron Age structure or enclosure. Excavation of the ring ditch revealed a deep, pronounced V-shaped cut, which contained Iron Age pottery although the radiocarbon date produced was Early Bronze Age. Further fieldwork is obviously required at this site to elucidate the dating and function of the internal feature.

The site at Warham (NHER 1828), which lies within the Coastal Zone, is located on the lower slopes of a spur of land forming part of the valley of the River Stiffkey. It is defined by two large, circular bank and ditch ramparts, which measure 215m in diameter externally and 135m internally (Fig. 6.1). The site would have been surrounded on three sides by marsh and

by the river to its west, which would have provided some natural defence. The eastern side, which is overlooked by higher ground, had superior ramparts to compensate for its greater vulnerability (Davies 1999, 31). Originally, the southwestern quadrant would also have been defined by earthworks, but these were levelled during the mid-18th century to improve the view from a nearby house (Warham Grove House) and to straighten the course of the river. Excavations at the site revealed evidence of both Iron Age and Roman occupation and activity, although the nature of this occupation is not clear. The fort at South Creak is located on higher ground 11 km away (on the 60m contour), and positioned overlooking the River Burn valley. These two forts thus occupy strategic positions in relation to two of the principal river valleys flowing out to the north Norfolk coast. Their circularity, together with that of another fort at Narborough (NHER 3975), distinguishes them from the other Norfolk forts, which are all more irregular in plan. The more elongated and curvilinear form of the forts at Thetford (NHER 5747) and Holkham (NHER 1776), for example, follow the national trend of reflecting the local topography (Hutcheson & Ashwin 2005, 25).

The fort at Holkham (NHER 1776) is located amongst saltmarsh on a curving sandspit promontory. It lies below the 5m contour and would presumably have been surrounded by open water and tidal creeks. The site, which measures 260m by 195m, is bounded to the east by two banks. There are a number of causeways in the banks and some of these may be original features (Fig. 6.1). The western portion is partially defined by a meandering creek. The location of the site is reminiscent of the large Iron Age fort at Stonea Camp, in the Cambridgeshire Fens, which is situated above the marshy ground, on a promontory of a low island with an active watercourse running alongside. The Iron Age fort at Thetford also used the bend of a major river to define the southern part of its defences. It would appear that riverine and marshy locations were of significance in the siting of these forts.

### **6.2.2 Settlements and Farmsteads**

As discussed above, evidence suggests that the nature of Iron Age settlement varied. Although it is thought to have been largely unenclosed, some sites were surrounded by banks and ditches, as the West Harling and Trowse excavations have demonstrated. The Early to Middle Iron Age rectangular ditched enclosures excavated at Trowse (NHER 9589) had no obvious characteristics that would enable the identification of this particular class of site on the basis of plan-form alone. Their morphology is similar to a number of sites mapped in the Coastal Zone by the NMP, which are generally considered to be Late Iron Age to Roman in date. These are discussed in more detail in Section 7.1 but it is possible that many of these 'later' enclosures are in fact of wholly Iron Age in date. In addition to these sites, a number of small enclosed farmsteads or settlements were mapped (such as the site at Heacham, NHER 13032, see Case Study VI), which are likely to have originated in the Late Iron Age, although few have any direct dating evidence. See Section 7.1 for discussion.



### **6.2.3 Rectangular Thornham-Type Enclosures**

Iron Age studies within Norfolk frequently discuss a postulated group of Iron Age rectangular enclosures, known as 'Thornham'-type enclosures, found in west and north Norfolk (Gregory 1986c, 32-35; Davies 1996, 77-8; Davies 1999, 32). These have been characterised as being ditched, rectangular, having a single entrance, and enclosing an area of c. 0.25ha measuring approximately 60–80m across (Davies 1999, 32). Three examples of this enclosure-type have been excavated (Gregory & Gurney, 1986), but the majority are known only from aerial photographs. The excavations have generally pointed to a Late Iron Age or early Roman date. One of the sites, Warham Burrows (NHER 1827, Fig. 6.1), which has been dated to the Late Iron Age (Gregory 1986b, 17-21), is located immediately to the northeast of Warham hillfort. The Thornham enclosure (NHER 1308), which gives its name to the group, appears to have been a defended Roman site (Gregory 1986a, 1-13).

The Thornham-type enclosures grouped together by Gregory (1986c) do not appear to represent a coherent class of monument when their differing dates and the varied types of activity taking place at the sites (indicated by the excavation results) are taken into consideration. Although the plans of some of the sites appear to have shared characteristics, there are also many differences both in plan and scale. Four sites are roughly square in plan and measure approximately 50m across, and these differ markedly in size and shape from the other enclosures (see Section 7.1.2 for further discussion of some of these sites). Three of the enclosures – Thornham (NHER 1308), Warham (NHER 1827) and Wighton (NHER 2072) – share a similar size and plan-form. A search of the NMP dataset for sites with similar morphological characteristics to these enclosures suggests that ten further examples may have been mapped within the Coastal Zone. However, given the lack of coherence within the excavated examples, there is no convincing evidence to suggest that any of these cropmark examples will be contemporaneous or have a comparable context. These sub-rectangular enclosures are instead discussed more broadly in relation to settlement of non-specific Iron Age/Roman date (Section 7.1).

### **6.3 Square Barrows or Square-Ditched Funerary Enclosures**

NMP mapping within the Coastal Zone has identified a number of small, square-ditched enclosures. It is possible that these represent new square barrow sites of Iron Age date, although the exact nature, date and contemporaneity of these sites has not yet been established. The square barrow tradition is generally characterised by the Arras burials of East Yorkshire, which date to the late 5th to 1st century BC (Stead 1979, 64; Dent 1995, 87). The barrows generally measure 7–18m across (Whimster 1981, 11). Similar sized enclosures are recorded on aerial photographs in many locations in England and Scotland, although the current lack of comparable excavated sites would suggest that the Arras barrow tradition was not widespread outside East Yorkshire. Within East Anglia, however, there is increasing evidence of a tradition (or several) involving the construction of square-ditched enclosures,

which appear to have had a funerary, mortuary or 'ritual' function. The dating of these features is as yet uncertain, although an Iron Age or Roman date is indicated by the limited excavations that have taken place. A review of the regional evidence for these sites is included below.

### **6.3.1 The NMP Evidence**

A total of twenty-four possible square barrows are recorded across Norfolk in the NHER, although some of these, such as the earthwork within Westacre Priory (NHER 16580), are unlikely to be Iron Age in date. Apart from the Westacre site, and a second site at Longham (NHER 13025), which was discovered during an excavation and will be discussed later, all of these sites were primarily identified from aerial photographs. Nine possible square barrows or square-ditched funerary enclosures have been identified within the Coastal Zone. To date, another three sites have been recorded by on-going NMP mapping within the Broads Zone (NHER 25647, 44854 and 44980). At three of these sites (Roughton, NHER 38476, Hanworth NHER 13027 and 38470, and Kirby Cane, NHER 25647), more than one enclosure is visible, giving a total of seventeen possible examples mapped to date in the both the Coastal Zone and Broads areas (Fig. 6.2).

The sites exhibit a number of key characteristics. They are all square, sub-rectangular or (in two cases) slightly trapezoidal in plan, and they measure between 8m and 16m across. An 18m wide trapezoidal enclosure identified at Roughton (NHER 6747) may also be a related site, although its archaeological origin is doubtful. Just under half of the enclosures have a pit within the interior, possibly representing a central grave or cremation deposit. The majority have rounded corners. Only one site, which is not in the Coastal Zone, has a pronounced angular shape (Kirby Cane, NHER 25647). This site is reminiscent in size and shape to a Romano-Celtic temple, and is also comparable with one of the square-ditched enclosures excavated at Harford, near Norwich (NHER 9794) (see Section 6.3.2 for details). A number of the enclosures have breaks or causeways in the ditch. In some cases this may represent a break in the cropmark response, rather than an interrupted ditch, but some of the causeways do appear to be genuine.

### **6.3.2 Summary of Evidence for Square Barrows or Enclosures in East Anglia**

There have been relatively few excavations of square barrows or square-ditched enclosures in East Anglia. A number of square-ditched enclosures were excavated near to the Maxey henge, Cambridgeshire. These measured 8m - 11m across. No evidence of internal features or graves was recovered, although this was felt to be a result of severe surface stripping levels. The possible remains of a gravel mounds or internal banks were possibly indicated (Pryor & French 1985a, 237, 1985b, 260). Ditches dating to the later Middle Iron Age cut two of the enclosures, whilst ditches and pits dating to mid-1st century AD cut other examples. Another possible site, measuring 9m by 7m, was excavated in the Ouse Valley, Cambridgeshire (Jones 1997) and was dated to the Middle Iron Age. During a recent

Monuments Protection Programme project in Cambridgeshire, which reviewed the evidence for possible square barrows, only two of the ten previously recorded sites were considered to be of this monument class (Thoden van Velzen 2003, 22-3). Three of the sites were reinterpreted as square enclosures, due to the presence of entrances and the lack of visible grave-shafts (*ibid.*) (See Section 6.3.3 below for discussion of visible grave pits).

Evidence for the existence of similar features in Suffolk is scant. A few small rectangular or square enclosures have been recorded from aerial photographs in Suffolk, although none has been excavated. Two possible examples, one in Bucklesham (SSMR BUC 026) and another in Trimley St Martin parish (SSMR TYN 071), have both been reinterpreted as part of recent NMP work as being probably medieval to post medieval in date (Cain Hegarty, formerly Suffolk County Council, pers. comm.). A square ditched enclosure, 5m across and with rounded corners, has recently been excavated at Brandon in Suffolk, on the Norfolk/Suffolk border (Gibson 2004, 25, 58). The enclosure was tentatively dated to the Late Bronze Age due to its shared alignment with field boundaries of this date, although the ditches produced no dating evidence. No internal features or evidence of a mound was recovered.

The only comparable square-ditched enclosures excavated in Norfolk were located at Harford Farm (Caistor St Edmund, NHER 9794) and Trowse (NHER 9589), near Norwich, overlooking the Yare Valley, and at Longham in central Norfolk (NHER 13025). One characteristic of all these sites is that they are aligned on or near to the cardinal points. At Harford Farm six square enclosures formed a line running north-to-south. The enclosures ranged in size from 10m to 17m across (Ashwin & Bates 2000, 117-123). One was surrounded by a possible palisade trench and has been likened to a Romano-Celtic shrine. However, it must be noted that the plan of this palisaded enclosure differs slightly from the other examples, in that it had a narrower ditch and the inner enclosure was quite regular. No central graves or funerary deposits were found, but evidence of an isolated cremation of probable early to mid 1st-century AD date was found close to one of the enclosures (*ibid.*, 125). The lack of funerary features within the enclosures may be a result of plough damage, as some of the graves belonging to the Bronze Age round barrows evident at the same site are thought to have been destroyed in this manner (Ashwin & Bates 2000, 52). No definite evidence of central mounds was revealed either, although an internal bank or rampart may have existed within at least one of the enclosures (Ashwin & Bates 2000, 138). All of the enclosures appeared to post-date the Middle Iron Age settlement at the site. A 3rd-century AD coin was recovered from the upper fill of one of the ditches, suggesting that they were still partially open at this date.

The two square enclosures excavated at Trowse (NHER 9589), 2.8km to the northeast of the Harford site, measured 6.5–9.0m across (Ashwin & Bates 2000, 80). The disappearance of a later ditch within the centre of the one of square enclosures suggests the original presence of an inner mound or bank, although no definite sign of one was recorded during the excavation.

No internal features were detected, although again many of the features at the site had been heavily truncated by recent agriculture (ibid., 163). A small amount of Iron Age pottery was found within one of the enclosure ditches, although this was considered to be residual by the excavators. It is interesting to note that the alignment of the square enclosures mirrors that of Early to Middle Iron Age boundary ditches to their immediate north. At the Longham site, central Norfolk, a square enclosure measuring 10m across with a central pit measuring 2m by 1.5m was excavated (NHER 13025). It was thought to probably be of Middle to Late Iron Age date (Ashwin & Flitcroft 1999, 253) and was sited in close proximity to the Launditch, a linear earthwork of possible Iron Age date (Davies 1996, 75-77). No evidence of an interment or cremation was recovered from the central pit, although both this and the enclosure's ditches were heavily eroded by ploughing.

### **6.3.3 Discussion of Sites within a National Context**

The East Anglian evidence would therefore appear to suggest a tradition of square ditched enclosures, potentially with either an internal rampart or mound, dating broadly to the Iron Age or Roman period. The Harford Farm and Trowse sites do appear to closely resemble a group of square enclosures, known only from aerial photographs, located in the East Midlands, Essex and the Welland Valley (Whimster 1981, 121-3). In particular, the plan and linear arrangement of the enclosures at Harford Farm mirrors that of a group of enclosures at Greatford, Lincolnshire (Ashwin & Bates 2000, 138). The excavators of the Harford and Trowse sites felt that a number of enclosure groups excavated in Essex, in particular at Mucking and Verulamium, were the strongest parallels for the Norfolk sites. These comprised linear groups of small, conjoined square enclosures containing a central cremation (Whimster 1981, 126-8; Ashwin & Bates 2000, 138). It has therefore been suggested that the East Anglian sites may fit into a Late Iron Age – early Roman tradition of cremation, influenced by contact with Northern France.

It is not immediately obvious how, if at all, these East Anglian sites relate to other British square barrow sites. An inner bank rather than a central mound was suggested by Stead for some of barrows at Garton Station, East Yorkshire (Jones 1997, 11). The lack of 'prominent central grave-shafts' characteristic of Arras burials (Ashwin & Bates 2000, 138) has been cited as revealing a regional difference or perhaps being indicative of a non-barrow origin. However, a substantial grave cut is often only a feature of the later, smaller square barrows, which form densely populated cemeteries. The larger and earlier barrows tend not to have a deep central grave, the body being placed on the former ground surface or in a very shallow cut. Many of the large barrows within one of the Burton Fleming groups (East Yorkshire) contained no trace of a burial (Whimster 1981, 88-9).

### **6.3.4 Discussion of NMP Sites**

It would appear that the small square enclosures mapped within the Coastal Zone (and beyond) share many characteristics with the sites excavated to date in East Anglia. It must be

noted, however, that there is at least one potentially important difference. The NMP sites do not demonstrate the linear arrangement and shared orientation common at excavated sites, and at those in the East Midlands, Essex and the Welland Valley which are known from aerial photographs. Only two sites (NHER 38476, Hanworth, and NHER 25647, Kirby Cane) have a comparable layout, although it is not as pronounced as at other sites. The significance of this difference is not clear from the current evidence, but it may be indicative of a chronological or functional distinction.

The NMP mapping has highlighted some clear spatial relationships which may have chronological implications. Half of the sites are located immediately next to, or within a group of, one or more ring ditches. The remainder lie within 500m of the same. This relationship is mirrored both at Harford Farm and at Maxey in Cambridgeshire. Three of the ring ditches are quite large, measuring 15–25m in diameter, and are likely to represent the remains of Bronze Age barrows. However, the majority of the ring ditches are quite small for barrows of this date, ranging instead from 7m to 15m in diameter. Three of these smaller ring ditches have central pits, which may indicate graves or cremations. Ring ditches of comparable dimensions have been interpreted as late prehistoric or Roman date roundhouses (Section 7.1), largely due to their size and their positioning within enclosures of similar date. However, none of the square-ditched enclosures, with the exception of NHER 26626 (Ingoldisthorpe) and possibly also NHER 44980 (Wheatacre), appears to be located within a settlement context. Although it is possible that the small ring ditches and their accompanying enclosures are the remains of unenclosed settlements, the positioning, arrangement and context of the ring ditches would suggest a funerary function and probably of Middle Bronze Age date. However it is possible that some of the ring ditches may themselves represent barrows of Iron Age or Roman date.

Given the relative scarcity of these sites within Norfolk it is important to note that a significant number are geographically clustered together. Seven of the sites are located in the adjacent Hanworth and Roughton parishes and are within 2.5 km of one another. Two other square enclosures are located in the Filby parish and are approximately 500m apart. Both of these clusters are located within landscapes dominated by earlier prehistoric funerary and ceremonial monuments, in particular at Roughton, see Case Study I above.

Five of the NMP sites appear to be positioned alongside trackways, and it is interesting to note that these are amongst the sites not located directly adjacent to ring ditches or round barrows. Although the date of the trackways is not known for certain, a late prehistoric or Roman date has been suggested for all of them. Whether the trackways and the square-ditched enclosures are contemporary is also uncertain, although at two sites in the neighbouring parishes of Hanworth and Roughton (NHER 13027 & 38470; NHER 38476) the enclosures appear to have been deliberately positioned alongside the trackways, or perhaps vice versa. If the Launditch was a major Iron Age boundary, then the Longham enclosure may

have had a similar setting. This association with earlier funerary monuments, major boundaries, and trackways is extremely reminiscent of some of the square barrows of East Yorkshire (Bevan 1999, 85). The landscape setting of the NMP sites is also similar to that of the Harford and Trowse enclosures, which are located on higher ground overlooking river valleys, most notably the confluence of the Yare and Tas. Most of the sites mapped by the project are located in elevated positions within the landscape, often overlooking minor valleys and streams. In the case of NHER 44980 at Wheatacre (outside the Coastal Zone) the square enclosure was positioned on the edge of slightly higher land on the southern side of the Waveney Valley, overlooking former fen and estuarine marshes.

The NMP mapping completed to date, together with the excavated evidence, seems to suggest that within Norfolk there was a tradition of constructing square-ditched enclosures, probably for funerary-related purposes, and that these are of Iron Age or, in some cases, perhaps Roman date. The presence of central pits in some of the mapped examples suggests the possible presence of graves or cremation deposits. No evidence of a central mound is visible at the NMP sites, but this does not necessarily point to the original absence of such a feature, or a secular or domestic use. Only a small fraction of the ring ditches recorded as probable prehistoric round barrows have visible mounds, or even central grave pits, yet this is not generally seen as an indicator of a non-funerary context.

## 7 Iron Age and Roman (800 BC – AD 409)

### 7.1 Settlement

#### 7.1.1 Introduction

The increased visibility of evidence relating to settlement and agriculture during the later Iron Age and Roman periods is in stark contrast to the preceding prehistoric periods. Recent evidence, however, indicates that this may be a product of our interpretative frameworks and the tendency to assign an Iron Age to Roman date to any undated rectilinear enclosure complexes and fields on the basis of their morphology alone. As outlined in Sections 5.4, 5.5 and 6.2, recent excavations are providing evidence that at least some of these enclosures and fields possibly originated in the period spanning the Bronze Age to Middle Iron Age, although there is too little evidence as yet to speculate on how common a trait this is across Norfolk. Until additional excavation evidence proves this pattern to be more widespread it must be assumed the vast majority of the rectilinear enclosures and fields recorded by the NMP project are likely to date from the Late Iron Age to Roman period. This is due to the increasing enclosure of domestic and agricultural sites from this period, which makes them more easily detected on aerial photographs. At the same time, while a higher proportion of settlements in the later Iron Age appear to have been enclosed, large unenclosed sites were still common in Norfolk (Davies 1996, 70; Bryant 1997, 28); some of the open settlements may represent the continuing use of Middle Iron Age sites, as at Park Hill, Wymondham (Davies 1996, 68).

Enclosures and settlements of the Late Iron Age and the Roman period are morphologically very similar, and without surface dating evidence or excavation it is extremely hard to assign either date to a site with any certainty. Only when there is clear evidence of one set of rectilinear enclosures overlying another, as at Hopton-on-Sea for example (discussed in Case Study IX), can any real attempt be made at separating Iron Age sites from those that are Roman. The enclosures and settlements of probable Iron Age to Roman date will therefore be dealt with together. A clear divide between the two periods may not even exist at many sites; excavation evidence from Norfolk indicates that a significant number of sites represent continuations from the Late Iron Age to the Roman period, such as Spong Hill in central Norfolk, which remained in use from the Late Iron Age to the 4th century AD (Davies 1996, 70).

The regional study of Roman rural settlement in East Anglia has concentrated on that associated with villas and small towns, and this means that there is only a limited understanding of the smaller villages, hamlets and farmsteads that would have represented

the bulk of domestic settlement during this period (Going 1997, 38). Within Norfolk, the excavation of a number of settlements at Snettisham, Downham Market, Brettenham, Kilverstone and Watlington has now started to provide a clearer understanding of rural settlement (Gurney 2005, 28). Metal detecting and fieldwalking in Norfolk suggests that potentially it is reasonable to expect almost one Roman 'site' per square kilometre (*ibid.*), although the extent to which this can be translated into actual settlement density is limited as many 'sites' may relate to activity rather than occupation. The NMP evidence does not appear to indicate such a blanket distribution of sites for this period (see Section 7.1.2 and Fig. 7.2).

### **7.1.2 The NMP Evidence**

A total of 373 sites of probable Iron Age to Roman date were mapped within the Coastal Zone. This figure includes features such as salterns, Roman roads and military sites (the latter two groups are discussed in Chapter 8), as well as the evidence relating to settlement and agriculture, which constitutes 236 sites. The large number of sites that potentially date to this period means that they cannot realistically be analysed in detail within the scope of this report. Instead, the types of sites mapped will be summarised, and some of the main themes outlined and illustrated with case studies.

A total of 210 enclosures (or rather 210 sites with at least one enclosure) of probable Iron Age to Roman date were mapped. The vast majority of these sites (190) consisted of one or more rectilinear enclosures; fifty-seven of these also had rectangular enclosures, twenty had square enclosures, fourteen had double-ditched enclosures, and twelve had trapezoidal enclosures. Although a small number of polygonal and curvilinear enclosures were also recorded, a broadly rectilinear plan was much more typical (Figure 7.1 illustrates a sample of the enclosure forms recorded). The enclosures were often located within or near to other ditched features, such as field boundaries and trackways, but a number of sites appear to have been isolated. When an enclosure was considered to be part of a significant group of settlement features, it was recorded as a farmstead or settlement; forty-seven such sites were identified. A total of 148 field systems were also recorded, many of which were associated with enclosures of a probable domestic nature, although at some there was no apparent evidence of an association with enclosed settlement.

#### *Site Distribution*

The sites recorded as being Iron Age to Roman in date are quite clearly clustered on the northeast coast and in west Norfolk (Fig. 7.2). This distribution plainly corresponds to the Greensand Belt of west Norfolk and the light loamy soils of the northeast and east of the county, including the former islands of Flegg and Lothingland. Obviously, it is partly a product of the soils and geology of these areas, which provide excellent conditions for cropmark formation. However, the distribution is also likely to reflect a real archaeological trend with regards to preferred settlement location. A gap in the distribution of sites along the north coast is clearly delineated by the Chalk Escarpment. It is possible that this is due to less favourable



cropmark conditions and a general bias in the flying patterns of aerial photographers, but the distribution is so clustered towards the northeast that it seems likely that cropmark conditions are not the only factor.

### *Settlements and Farmsteads*

A total of forty-seven settlements and farmsteads of probable Iron Age to Roman date were mapped within the Coastal Zone. The settlements were generally characterised as medium to large areas of enclosures, fields and trackways, either conjoined or clustered together. Those at Snettisham (NHER 26626) and Hopton-on-Sea (NHER 43494) are the best examples of this type (Figs 7.3 & 7.6). Farmsteads were defined using similar characteristics, but represent domestic and agricultural sites constructed on a smaller scale, often based around one main domestic enclosure. The farmsteads at Heacham (NHER 13032) and Hopton-on-Sea (NHER 43528) provide the best examples of this site-type (Fig. 7.3). It should be noted, however, that not all of the sites interpreted as farmsteads had definite evidence of domestic structures, e.g. round houses, but rather the arrangement of the site was taken to indicate a domestic function.

One of the main characteristics of the settlement sites is a nucleated plan, usually focused around one or several conjoined enclosures. These enclosures are generally square, rectangular/rectilinear, or polygonal in shape. They are often well defined, with broad ditches, and they frequently possess one main entrance. The majority of settlements are associated with a trackway leading into the centre of the site or its main domestic area, as at Hopton-on-Sea (NHER 43494), Heacham (NHER 13032) and Nova Scotia Farm (Ormesby St Margaret/West Caister, NHER 12828). The size of the enclosures varies from site to site. Of the six main small settlements identified (Fig. 7.3), two definite trends can be identified; that the enclosures are either small and roughly square, measuring 40-50m across or are much larger and more rectangular or rectilinear in shape, such as Nova Scotia Farm, Hopton-on-Sea (NHER 43494) and Trunch (NHER 11867). Although it is worth noting that the internal enclosure at Trunch is the same size and shape as the square enclosures at Heacham and Hopton-on-Sea (NHER 43528), see below for discussion of other square enclosures.

The rectangular enclosure at Nova Scotia Farm, Ormesby St Margaret/West Caister (NHER 12828), and the main enclosure at Hopton-on-Sea (NHER 43494) are surprisingly similar in size, both measuring approximately 130m by 65m. The enclosures at Trunch (NHER 11867) and at Hopton-on-Sea (NHER 43494) both appear to have a higher degree of internal subdivision than usual. It is likely that this relates to the separation of domestic space from other activities, such as industry or stock management, although it must be noted that the internal enclosures at Trunch may represent an earlier or later phase of the site. The enclosure at Hopton-on-Sea (NHER 43494) has the clearest evidence of formal internal

subdivisions. A number of these have possible round houses within them and it is likely that many of these internal subdivisions relate to different households living within the settlement.

As the above discussion implies, a feature of the settlements and farmsteads is the presence of penannular ring ditches, interpreted as round houses. A total of fifty-two possible round houses have been recorded by the project. These, with one exception (NHER 33526, Cley next the Sea), are all under 20m in diameter. Just over half measure 10–20m in diameter. The lack of dating and excavation evidence for the majority of these features makes it impossible to discern any possible chronological trends in the data.

Not all the sites interpreted as being domestic had obvious evidence of structures; these were generally only found on particularly productive soils and geologies, such as the coverloams and the Greensand Belt. Again with reference only to the six main settlements identified (Fig. 7.3), two broad patterns can be identified. The smaller square enclosures at Heacham (NHER 13032) and Hopton-on-Sea (NHER 43525) have relatively large round houses, measuring 12–17m in diameter. The round houses within the larger enclosure at Hopton-on-Sea (NHER 43494) and Bradwell (NHER 45052) are considerably smaller, ranging in size from 4m to 9.5m. It is probable that the difference in size reflects a chronological or functional difference. It is worth noting that a number of Middle Iron Age eaves-drip gullies, suggesting structures 4–10m in diameter, were excavated at Harford Farm, near Norwich (Ashwin & Bates 2000, 97), and these were interpreted as being from relatively temporary or insubstantial structures, which were possibly agricultural in nature. Slightly larger round houses, 12m in diameter, were also excavated at this site; these were identified from a ring of postholes rather than an eaves-drip gully (*ibid.*, 95). The fact that the larger ring ditches at Heacham (NHER 43535) and Hopton-on-Sea (NHER 43525) were also located within enclosures of a different style could appear to point to a chronological difference.

The square Hopton-on-Sea enclosure (NHER 43525) is possibly associated with early Roman material, dating from the mid to late 1st century AD, and later material dating to the 2nd century AD, although the relationship between the finds and the enclosure is not clear. A total of twenty square enclosures of possible Iron Age to Roman date were located within the Coastal Zone (Figure 7.4 illustrates a sample of the square enclosures recorded). These range in size from 30m to 100m, although the majority fall between 30m and 50m. Four are located within a settlement at Snettisham (see Case Study VII below), and are likely to be Roman in date. The square enclosures at Stiffkey (NHER 38628) are also associated with Roman material. Although the Heacham enclosure (NHER 13032) is potentially Iron Age in origin, suggesting that not all of these sites are Roman. The similarity in size and shape and the clear presence of the roundhouses at the Heacham site could that all of these small square enclosures represent Iron Age to Roman farmsteads.

### *Settlements and Farmsteads of Possible Iron Age Date*

Many of the possible Iron Age to Roman settlements and farmsteads recorded by the project have no associated finds or dating evidence and have been assigned this date on the basis of their morphology. Consequently the opportunities to make a chronological distinction between the Iron Age and Roman sites are quite limited. However, the Heacham farmstead (NHER 13032) may have Iron Age material associated with it (see Case Study VI below). The settlement and fields at Nova Scotia Farm, Ormesby St Margaret/West Caister (NHER 12828), which are described in detail in Case Study III, may also be of Iron Age date. Although the main elements of the site are Middle Bronze Age, some of the ditches appear to relate to a later phase. In particular, the rectangular enclosure discussed above, and the trackway at the centre of the site, seem to be later elements. Iron Age material has been recovered from some of the ditches associated with the enclosure (Bates & Crowson 2004, 30). However, there is also evidence of Roman activity in the area of this enclosure, including a cremation urn (*ibid.*, 33). The cropmarks of a field system and possibly also domestic enclosures recorded at Caister-on-Sea (NHER 27513) are overlain by part of the vicus associated with Caister shore fort. The latter probably dates to the mid-2nd to mid-4th centuries AD (Gurney 2002, 21-31), suggesting a relatively early date for the underlying features. The postulated pre-Roman parts of the site are quite fragmentary and include few distinguishable 'domestic' features; it is possible that the majority of the enclosures are agricultural.

A similar relationship can be established at the Hopton-on-Sea settlement (NHER 43494), which has been discussed above in relation to enclosure characteristics and internal structures. The site appears to be overlain by a planned Roman field system (NHER 43495), which is undated but probably relates to the mid to late Roman period. Iron Age material, comprising a 1st- to 2nd-century BC brooch and terret fragment, has been retrieved from the area of the settlement (NHER 11788). A total of eight domestic or agricultural structures are visible, all within the main enclosed area, which is positioned alongside a major trackway. In addition to the main enclosures there are a series of smaller conjoined enclosed areas, many of which are likely to have been stock enclosures and paddocks. Surrounding the main focus of the enclosure is a series of fragmentary rectilinear and coaxial field boundaries. This relatively large settlement lies only 1km to the northeast of the other Hopton-on-Sea farmstead (NHER 43525). It is likely that the two sites were broadly contemporary and both appear to be overlain by elements of the later Roman field system.

### **Case Study VI: Heacham (NHER 13032)**

The farmstead or small settlement at Heacham represents a fine example of a nucleated domestic and farming complex (Fig. 7.3). The site is associated with either Iron Age or Roman pottery (the identification is uncertain). The complexity and multi-phase nature of the cropmarks would suggest that the settlement was relatively long-lived. It may have originated

in the Iron Age and developed through to the Roman period. It has been tentatively suggested that the double-ditched D-shaped enclosure at the centre of the site, interpreted as one of the earliest elements, could even be Bronze Age in origin (see Section 5.4).

The main focus of the settlement in the Iron Age to Roman period was a square enclosure measuring 50m across, defined by a substantial ditch up to 4m wide and an inner bank. The enclosure is approached by a wide, well-used or surfaced trackway. Within the interior of the enclosure are three round houses, each measuring 12–17m in diameter. It is interesting to note that the entrance into the main domestic area appears to be blocked by the line of the inner bank, and a ditch also cuts across this point on the inside of the bank. The track or droveway leading to the enclosure appears to feed into a conjoined enclosure to the north, which then leads to the main domestic enclosure along an extremely narrow walkway or corridor. This suggests an extremely elaborate and formal entrance to the domestic part of the site.

The land surrounding the enclosure was heavily enclosed. Two 'styles' of enclosure are evident. To the west the enclosures are quite large, ranging from 30m to 90m across, and they have a series of trackways running through them. To the east of the site the land was divided into narrow strips, 4–8m wide. It seems likely that the larger enclosures, which are associated with trackways, represent stock enclosures and paddocks; the smaller strip fields may have been used for cultivation. It is clear that the cropmarks reveal more than one phase of enclosure and it is likely that the site plan represents a palimpsest of several layouts to the settlement. It is worth noting that the presence of pits within the less enclosed area to the northeast of the site could represent the remains of former open settlement or some sort of industrial activity.

The Heacham site is located on the coastal saltmarsh zone, at just below 5m OD. It would have been ideally situated to utilise both coastal and marshland resources. The cropmarks of tidal creeks meander across the site, suggesting that the area has been subject to some degree of coastal change throughout its history. It is not clear whether any of these creeks were active during the Iron Age to Roman period, although the relationship between the enclosures and the channels would suggest that they were not. It may be inferred that sea-levels were slightly lower at the time this site was occupied, or that this area was somehow protected from major influxes of tidal waters.

#### *Settlements and Farmsteads of Possible Roman date*

As has been stated above, the settlements at Heacham (NHER 13032) and Hopton-on-Sea (NHER 43525) probably continued in use into the Roman period. A total of eleven further possible farmsteads can also be associated with finds of Roman date (Figure 7.5 illustrates a sample of these sites). The fragmentary cropmarks of a rectilinear enclosure at Sedgeford

(NHER 13070) are associated with Roman pottery, including 3rd- to 4th-century mortaria fragments. A square enclosure at Brumstead (NHER 38536) is also associated with Roman pottery. A large enclosure or farmstead at Happisburgh (NHER 38744), consisting of enclosures, trackways, ditches and field boundaries, is also possibly associated with Roman pottery and a 3rd-century coin. At Witton (NHER 38866) a fragmentary rectilinear enclosure is located in close proximity to finds of Roman pottery and undated flint and mortar foundations, and further pottery and a kiln have been recorded nearby (NHER 7023). The cropmarks of a farmstead or enclosure complex at Paston (NHER 39016) are located near to finds of Romano-British pottery, as are the rectilinear enclosures at Ringstead (NHER 43352).

All of these enclosures are particularly rectilinear and rectangular in shape, and are characteristically regular in plan. One site, Burnham Overy (NHER 12984), exhibits a little more irregularity in its layout, although this site also shows possible evidence of having more than one phase. This suggests that the more regular and rectangular the enclosure, the more likely it is to be of a Roman date, although excavation of some of these sites would obviously be required to ascertain whether this is actually the case. Only one large Roman settlement site within the Coastal Zone (NHER 26626, Snettisham) has been the subject of significant excavation. This is described in Case Study VII below.

#### **Case Study VII: Snettisham (NHER 26626, also NHER 18236, 21846, 30303–4, 36211 & 38288–90)**

The Late Iron Age to Roman settlement at Snettisham is located on the Greensand Belt in west Norfolk (Fig. 7.6). This is a band of sands and gravels that runs from the parish of Dersingham to the south, through Ingoldisthorpe and Snettisham and into Heacham to the north. This area appears to have been particularly favoured for settlement in this period, and the legacy is a complex series of multi-phase cropmarks. The geology and soils in this area have produced superb cropmarks and reveal an exceptionally complex settlement spreading for almost 2km. It is situated on land between the 10m and 35m OD contours, taking advantage of the zone between the saltmarsh to the west and the chalk ridge to the east.

The excavated parts of the settlement suggest that it was established in the mid-1st century AD, and that it continued to expand throughout the late 1st and 2nd century, reaching its greatest extent by the end of the 2nd century. After this the site appears to have declined gradually, eventually being abandoned at the end of the 3rd century (Flitcroft 2001, 79). However, the excavations took place within the northeastern part of the site, where the system of fields and tracks does not appear to be as complex as other areas to the south. The cropmark evidence from unexcavated parts of the site seems to indicate several phases of activity, and it may be that some elements of the site date back to the Iron Age. Late Iron Age finds appear to be relatively widely distributed across the site, suggesting pre-Roman activity and settlement.

The archaeological context for this large and complex site has been published elsewhere (Brennand 2004). The cropmarks reveal evidence of ditched enclosures and fields, with a series of trackways or droveways running through the site. The general alignments within the system of fields and droveways can be traced over distances of up to 1.5km, although a more detailed analysis would suggest that there was not one single planned system of land division. The inter-cutting nature of many of the ditches, and the variable size of the fields and enclosures, suggests a more piecemeal development following only approximate alignments.

There is also evidence for the significant alteration and realignment of field boundaries throughout the life of the settlement. Within one part of the site (NHER 1554) three separate phases of enclosure are visible. Many of the fields and enclosures appear to have been laid out respecting the multiple double-ditched tracks or droveways that join dispersed and separate areas of fields (Fig. 7.6 inset). These trackways obviously acted as a means of access between individual houses and fields, but also provided a means of passage across the field systems, from the chalk upland to the east onto the saltmarsh to the west. The trackways incorporate a series of funnels that are likely to relate to the movement and management of stock. It is probable that the uplands and the saltmarsh were each being exploited for grazing at different times of year, and the droveways would have acted as seasonal routes for the movement of stock. On the saltmarsh to the west, several mounds and soilmarks have been identified that correspond with finds of briquetage contemporary with this settlement; these have been interpreted as 'red hills', i.e. mounds of debris derived from salt production (Fig. 7.6 inset). This would suggest that the saltmarsh was being used for salt production in tandem with grazing and, presumably, wild fowling. Salt production during this period is discussed in more detail in Section 7.3 below.

Within the settlement four square enclosures are visible, positioned in an approximately northwest-to-southeast alignment, between 275m and 450m apart (Fig. 7.6 inset). Each of the enclosures has a slightly different appearance; one is defined by a broad ditch, one is embanked, and the other two are double-ditched. Each enclosure has an internal area of approximately 30m by 30m and, most significantly, all the enclosures share the same orientation. Despite the different means by which they are enclosed, the similarity of their plan and positioning would appear to suggest that they are all contemporary with one another. This in turn might indicate that each enclosure operated as a nucleus of settlement, a special site or corral for a specific area of land. One of the enclosures has numerous pits within the interior and this may indicate domestic activity. Other square enclosures of this size within Norfolk are discussed in Section 7.1.2.

## *Roman Villas*

Norfolk does not have an abundance of known Roman villa sites and those that are recorded lie mainly in the west and south of the county (Gurney 2005, 29). Although eight possible villas are recorded on the NHER as lying within the Coastal Zone, many of these, on closer inspection of the evidence, are more likely to be farmsteads than true villas. In addition, some of the sites of known villa status, such as Park Farm (Snettisham, NHER 1514), did not produce any cropmark evidence. A small group of rectilinear enclosures were recorded at Kelling (NHER 27951) adjacent to the site of the Six Acre Valley villa (NHER 6228), but it was unclear whether the two were directly associated. The only definite Roman villa site was mapped on the very edge of the Coastal Zone at Fring, with a second probable site lying a short distance to its northwest.

### **Case Study VIII: Fring Roman Villa Sites**

The main villa site at Fring (NHER 1659) lies immediately to the east of the Peddars Way Roman road (NHER 1289) on the east-facing slope of a small dry valley and is protected as a Scheduled Monument. It was first discovered by aerial photography in June 1974 (Edwards 1977, 234-6). The villa complex comprises a rectilinear double-ditched enclosure lying on a southwest to northeast axis (Fig. 7.7). A trapezoidal annexe enclosure is present on its southeast side.

Cropmarks of the masonry walls or foundations of three buildings were recorded in the central part of the main enclosure. Two of the buildings are rectangular in plan and are likely to have had a domestic function. They both comprise a large central room with smaller rooms at each end. Further small rooms are also visible in the corner of one of the buildings. To the north of these two buildings are cropmarks of a hexagonal structure, possibly a small Romano-Celtic temple or shrine.

The northeastern part of the double-ditched enclosure contains cropmarks of a further possible rectangular structure attached to a curvilinear enclosure. The cropmarks possibly relate to the foundation trenches of a timber structure or the robbed-out masonry walls of another rectangular building on a similar alignment to one of the two buildings in the main enclosure. These cropmarks are likely to relate to a different phase of Roman activity to that represented by the buildings in the main villa enclosure.

A rectilinear pattern of ditch cropmarks is present to the southwest of the main enclosure. It is possible that these relate to part of a field system associated with the villa. The cropmarks associated with the villa show a marked difference in alignment to Peddars Way and the overall appearance is that the road might cut across the enclosures. However, there is no cropmark evidence to suggest that the villa complex continued to the west of the road. It is more likely that the alignment of the villa enclosure was governed by the topography.

The second possible villa site at Fring (NHER 1661) is located 500m to the northwest on the west side of the Peddars Way (Fig. 7.7). The site was first discovered in the late 18th century when a tessellated pavement was found. It comprises a long rectangular double-ditched enclosure that is aligned along a small dry valley rather than in relation to the adjacent Roman road. The enclosure is cut lengthways by a modern road and no significant internal features are visible as cropmarks. A linear ditch extending north to the Peddars Way at a right angle to the enclosure may mark the line of a track linking the two. Other parallel linear ditch cropmarks on a similar alignment cut across the enclosure and appear to relate to trackways of earlier or later date than the possible villa. Also immediately to the north of the villa enclosure are cropmarks of numerous enclosures and possible round houses. The appearance of these cropmarks suggests an Iron Age predecessor for the Roman villa. This is supported by discoveries of Iron Age artefacts at the site including a hoard of 1st-century BC coins. The identification of this site as a villa is not certain, although it is clear from the discovery of the tessellated pavement and Roman artefacts that a significant building was located there. It is possible that the site could be a religious complex, perhaps with Iron Age origins, rather than a villa.

## **7.2 Field Systems**

The NMP mapping revealed masses of evidence for field systems thought to date to the Iron Age to Roman period, although the majority are interpreted as such on the basis of their morphology alone. As discussed in Section 5.5, it is possible that some of these field systems are Bronze Age in origin, probably continuing in use throughout the Iron Age to Roman period. This model of development is suggested by excavations at Nova Scotia Farm (Ormesby St Margaret/West Caister, NHER 12828) and mirrors the development of the prehistoric to Roman date fields at and around Sutton Hoo, Suffolk (Martin & Satchell forthcoming). The possibility that the field pattern of substantial areas of the modern landscape may have been determined by a coaxial system of land division dating back to the prehistoric period has been suggested for areas of south Norfolk and north Suffolk, in particular Scole and Dickleburgh. A Roman road, the Pye Road, appears to cut obliquely across a well-developed system of coaxial fields and this relationship has been taken to suggest an Iron Age date for the fields (Williamson 1987). It has also been suggested that the coaxial fields are Roman in date and relate to a centuriation system of land enclosure (Peterson 1998, 56-8). Although there is still some debate as to the original date of the boundaries (Hinton, 1997), it is now thought unlikely that they represent the fossilised remains of a single phase of planning. Some of the fields are likely to be medieval in date and reflect a gradual development of the enclosed landscape based on the broad alignments and boundaries potentially established in the Iron Age (Williamson 2006, 49-50). It is likely that most field systems developed in this manner over several hundreds of years, with dominant alignments being established in the prehistoric period and then continuing in use. The



establishment of a planned Roman field system at Hopton-on-Sea (NHER 43495), however, on top of a late prehistoric or Iron Age settlement and field system, indicates that development of the landscape is not always continuous (see Case Study IX below).

The size and layout of the field systems mapped by the project varies from site to site, although many of them are coaxial or regular in plan. Analysis of the fields at a relatively large scale has produced particularly interesting results and suggests the possible structuring of the landscape based on a system of land division that covers huge parts of northeast and east Norfolk. The vast majority of the fields are aligned broadly northeast-to-southwest and northwest-to-southeast. At a number of sites this alignment appears to be structured by Bronze Age boundaries, as at Nova Scotia Farm (Ormesby St Margaret/West Caister, NHER 12828) and at Witton (NHER 29753), see Section 5.5.

Many of the field systems appear to be located alongside settlement, as at Gunton Park, Thorpe Market, where a fragmentary field system (NHER 38499) is positioned next to a small rectangular farmstead (NHER 17739) (Fig. 7.8). The relationship between fields and domestic sites is not always obvious from aerial photographic evidence, perhaps because the cropmarks of the domestic site have not been recognised as such, or because the settlement was open and therefore left few traces that can be identified from the air. In addition, the domestic enclosure may not have been demarcated in a manner that differs from the field boundaries.

In addition to arable fields, a number of sites appear to be structured in a manner that would aid stock management and movement, including the funnelled droveways recorded at Snettisham (NHER 26626, see Case Study VII above and Fig. 7.6). Many of the field systems mapped have trackways running through the fields. At Gimingham (NHER 31746) a multiple-ditched boundary is visible which has a series of curvilinear discontinuous ditches, appearing to form a chain of droveways and boundaries (Fig. 7.9). The principal boundary occupies a distinctive topographic position, cutting across the narrowest point of the watershed between two streams, Mundesley Beck and Brandfield Beck. Similar sites have been mapped from aerial photographs in Lincolnshire (Boutwood 1998) and the Yorkshire Wolds (Stoertz 1997). These have been interpreted as droveways for the movement of stock to and from grazing pastures

#### **Case Study IX: Hopton-on-Sea Roman Field System (NHER 43495)**

The majority of the fields discussed above are dated broadly to the Iron Age to Roman period, but a group of fields at Hopton-on-Sea (NHER 43495) appears to represent a planned field system, probably dating to the mid to later Roman period (Fig. 7.10). This regular and coaxial field system appears to have been imposed upon an earlier landscape of late prehistoric settlement and fields (NHER 43494). While its cropmarks have largely been interpreted as

fields, it is possible that parts of the site were used for settlement. A number of possible round houses or circular agricultural structures were mapped that were perhaps contemporary with the fields, although this is not certain and they may instead relate to the underlying late prehistoric settlement. Unlike the earlier phase of activity, the enclosures belonging to the planned system do not have an obvious focus, although a number do have noticeably wider ditches. One also has internal subdivisions, which suggest that this area is being used for something more specialised than agriculture and could represent a domestic site. This site has been subject to metal detecting and fieldwalking and despite this only a relatively low number of finds of Roman date have been recovered; a number of Roman coins, a small amount of Roman pottery, a 1st-century AD brooch, and a figurine of Apollo have been found (NHER 11788 and 36627). This could support the interpretation of most of these enclosures as fields and rather than settlement areas.

The planned field system is 1.7km long and up to 0.9km wide, and is partly bordered to the west by a trackway, which may be an earlier feature that has been incorporated into the fields. The northern extent of the field system is clearly demarcated by a straight ditch that has a remarkably similar alignment to a possible Roman road (NHER 43591) approximately 2km to the northwest (see Section 8.3). The northern part of the site is extremely regular and coaxial, and all the fields are parallel to either the northern boundary or the western trackway. The central and southern parts of the site are less regular and may be positioned in relation to the earlier trackway, which becomes more sinuous at this point. It is possible that these differences in layout represent two different phases of enclosure, with the southern part incorporating existing prehistoric landscape features and the northern part ignoring all these and imposing a new layout. The fact that the fields to the north of the site continue straight over the underlying enclosures and fields and make no reference to the earlier features, seems to indicate that either these boundaries are significantly older and had gone completely out of use before the new fields and enclosures were laid out or that they represent a dramatic and potentially imposed phase of re-planning.

The field system lies approximately 5km to the southeast of the Roman shore fort of Burgh Castle (NHER 10471) and it is tempting to associate the two sites, the field system perhaps being indicative of military planning in this area. It can be postulated that it is associated with the establishment of a large estate, or perhaps represents land granted to soldiers. The angle of some of the fields to the north of the site is roughly consistent with a hypothetical centuriation system suggested for South Norfolk, which is oriented approximately 11 degrees west of north (Peterson 1997). (This theory relates in particular to the Scole/Dickleburgh area discussed above, Section 7.2, but it should be borne in mind that the date of these fields is still a matter of debate.) Despite this possible shared alignment with the Peterson's hypothetic centuriation system and while the field system does show definite evidence of planning, it was not felt that this necessarily reflected an overarching scheme imposed over a significant area.

Although its relationship with the possible Roman road to the northwest (NHER 43591) would appear to be indicative of a level of local planning during this period. The incorporation of existing landscape features and topographic changes would point to a more localised understanding of the landscape than one would expect to be associated with a centuriation landscape. It is interesting to note that the alignment of the Hopton field system persists into the historic period: a post medieval boundary (NHER 45159) marked on the 1813 Gorleston Enclosure Map and the edge of Hopton Common on the 1783 Hodskinson Map of Suffolk both mirror the alignment of the Roman fields.

### **7.3 Salterns**

Salterns – sites where marine salt was produced – are recorded all around the coastline of The Wash, with numerous Iron Age and Roman examples known from field surveys and excavations (Lane & Morris 2001, fig. 2). As the process of marine salt extraction is, by its very nature, coastal, the distribution of these sites provides a useful indication of the position of the edge of the dry land, or at least the inter-tidal zone, during the period in question. Salt production during the Late Iron Age and Roman period involved the evaporation of sea-water in troughs over a hearth, leaving behind the salt crystals. Fragments of these troughs and the pedestals that supported them, collectively known as briquetage, were dumped in waste mounds. These mounds are known as ‘red hills’ because the low-fired ceramic material that they contain creates distinctive reddish soilmarks when ploughed. Red hills have been extensively studied in the Essex estuaries (Fawn et al. 1990) and several recently identified examples have swelled the numbers known from Suffolk (Hegarty & Newsome 2005, 55-6). The Suffolk discoveries have demonstrated the benefits of targeted aerial reconnaissance using colour photography when searching for these sites, with five new red hills added to the eighteen previously recorded in that county. In Norfolk only five probable Roman saltern mounds were mapped by the NMP in the Coastal Zone, all on the eastern fringes of The Wash. The mounds are visible as both earthworks and irregular light-coloured soilmarks and cropmarks. Fire-bars and pottery of 1st- to early 2nd-century AD date have been found at one large mound at Sandringham (NHER 1562 & 1563), with possible Roman pottery also recorded from a second mound to its northwest (NHER 16499). On the basis of these dated examples, two further saltern mounds mapped at Snettisham (NHER 26624 & 26625) and a third at Dersingham (NHER 26607) were also assigned a possible Roman origin. The relationship between these salt production sites and contemporary Late Iron Age and Romano-British settlement is quite revealing. They lay immediately to the southwest of the extensive settlements and field systems mapped by the NMP at Snettisham (e.g. NHER 26626, see Case Study VII above and Fig. 7.6). The cropmarks indicate that a series of trackways ran through the main settlement area, possibly leading down from the chalk upland to the east, through the fields and enclosures, extending down onto the saltmarsh and into the vicinity of the salterns. It is probable that both the chalk and the saltmarsh would have been

used for grazing at different times of the year, with salt production taking place alongside other activities on the marshland.

No definite salterns of Roman date have been recorded in the east of the county, around the former Great Estuary for example, either through field survey or by the NMP. The absence of any firm evidence for Roman salt manufacture in this area is surprising. It is possible that any saltern sites were located on the inner reaches of the estuary, in areas that now form part of the Norfolk Broads. To date, ongoing NMP mapping in the Broads Zone has not revealed any evidence for salt-making that can be dated to the Roman period; it is possible that the sites lie concealed beneath later deposits.

## 8 Roman (AD 43 – 409)

### 8.1 The Coastline of Roman Norfolk

The Roman period is probably the earliest date for which it is possible to begin to reconstruct the position of the coastline at a level appropriate for a county-based study (Murphy 2005a, 7). However, the length of the period and the environmental changes that occurred over its four centuries mean that any map is only a generalisation based on the available evidence.

Extensive fieldwork and palaeoenvironmental sampling in the Fenland basin has enabled a detailed picture of the development of The Wash coastline to be determined (Hall & Coles 1994, Waller 1994). In very general terms, there was a rise in sea level during the Iron Age, followed by a period of marine regression in the early Roman period, which resulted in occupation of the marine silt deposits (Dark & Dark 1997, 24-5). A further transgression in the later Roman period caused the abandonment of some of these sites (Hall & Coles 1994, 114).

The dynamic nature of the north and northeast coasts of Norfolk mean that they have also changed considerably since the Roman period. The position and rate of movement of the barrier beaches and spits of the north coast, such as those at Scolt Head Island and Blakeney Point, have been used to suggest that the Roman coastline may have lain 2km to the north of its present position. The high level of erosion on the northeast Norfolk coast means that the Roman coastline, and any sites associated with it, will have long been lost.

In the east of the county was the Great Estuary, which represented the confluence of the modern Bure, Yare and Waveney rivers as they flowed into the North Sea (Fig. 8.1). The only remnant of this large tidal channel in the modern landscape is Breydon Water. The main channel lay to the south of Caister-on-Sea, approximately where Great Yarmouth is now located. A large sandbank, now referred to as 'Cerdic Sand', appears to have existed in the centre of the channel. To the north of the channel was the Isle of Flegg with the Caister-on-Sea shore fort on its south bank. It was separated from the rest of Norfolk on its western side by what is now the Bure Valley and by a smaller channel to its north in the vicinity of Winterton-on-Sea. To the south of the Great Estuary was the Lothingland peninsula, a long tongue of land bounded on its west side by what is now the Waveney Valley. The shore fort of Burgh Castle is located at the northeast corner of the peninsula, protecting the south side of the estuary. Although apparently remote, both Flegg and the Lothingland peninsula have extensive areas of Roman cropmark evidence indicating a high level of activity during this period. The estuary formed much of what is now the Norfolk Broads and provided access to the important Roman town of Venta Icenorum (Caistor St Edmund, NHER 9786).

## **8.2 Military Sites**

### **8.2.1 Early Military Sites**

Very few early Roman forts are known to exist in the county and none lies within the Coastal Zone. Sites previously considered to have a Roman military origin, such as the double-ditched rectangular enclosure at Thornham (NHER 1308) have been shown by excavation to be pre-Roman in date (Gregory 1986a, 1-13). The alignment of known Roman roads leading towards the coast has also been used to suggest the location of early military sites. Although such roads are known to exist (see Section 8.3 below) no Roman sites were identified by the NMP at their coastal termini. However, a military site at Holme-next-the-Sea, at the end of Peddars Way, is a strong possibility and there are unconfirmed reports of Roman finds in the inter-tidal zone (David Gurney pers. comm.).

### **8.2.2 The Roman Shore Forts**

During the 3rd and 4th centuries AD Roman military activity on the coast became more prominent, at least in terms of the surviving evidence. In the first part of this period a system of forts was constructed around the south and east coast of Roman Britain. This was referred to in a late 4th-century document as the *Litus Saxonicum* or 'Saxon Shore' of which Norfolk formed the northern part. This network of defences, usually and somewhat confusingly referred to as Saxon shore forts, has traditionally been seen as a response to the threat posed by 'Saxon' raiders attacking this coastline. However, more recent studies of the forts and their associated civilian settlements or *vici*, have begun to cast doubt on this idea. Whilst they probably did serve an important defensive role, it is probable that they also acted as ports, controlling the import and export of goods through the eastern part of the province (Gurney 2002, 9).

The Norfolk coast has three known shore fort sites at Brancaster (NHER 1001), Caister-on-Sea (NHER 8675) and Burgh Castle (NHER 10471). They differ in their form, date of construction, degree of survival and the extent to which they are visible on aerial photographs. All three sites have been subject to partial excavation (Johnson 1983; Hinchliffe & Green 1985; Darling & Gurney 1993) and as might be expected a wealth of information is available about each. This has been recently summarised in a guidebook to the Norfolk shore forts (Gurney 2002) and this report will concentrate on the extent to which the NMP mapping has added to our knowledge.

#### *Brancaster (Branodunum) (NHER 1001, 1002, 1003, 1004)*

The fort at Brancaster is situated on the north Norfolk coast adjacent to the modern saltmarsh along the edge of the Mow Creek channel (Fig. 8.2). In the Roman period, prior to the westward migration of Scolt Head Island, the creek was a wider channel with direct access to the sea. The main fort at Brancaster, which dates to around 225-250 AD, is visible as both cropmarks and slight earthworks (NHER 1001). It is roughly square in plan with an area of

just over 2.5 ha, making it similar to contemporary forts on Hadrian's Wall (Pearson 2002, 13). Although there are no standing remains of this fort, its perimeter wall, internal earth revetment, gates and corner towers are all visible as cropmarks (Fig. 8.2). In the central area of the fort the principia or headquarters building is also clearly visible as a cropmark. In the northeast quarter of the fort, cropmarks of a second building are present. This building lies on a different alignment to the fort walls and central principia and may be the praetorium (commander's residence) of an earlier fort on the same site (ibid., 14). This suggestion is given credence by the cropmark evidence for the surrounding vicus.

The vicus at Brancaster covers at least 23ha and is possibly the most extensive recorded at any of the British shore fort sites (NHER 1002, 1003). However, this may be due to the exceptional cropmark evidence at the site rather than it being genuinely larger than those at other forts. The mapped vicus lies principally to the west and east of the fort with further evidence to its south. It has a remarkably regular and planned appearance arranged along roads leading towards the west and east gates of the fort (Fig. 8.2). However, the alignment of these roads, and that of the vicus in general, is different to the latest visible fort. The vicus does however share the same alignment as the possible earlier building in the northeast area of the fort. These two pieces of information, derived solely from the aerial photograph evidence, support the existence of an earlier fort that was in use when the vicus was laid out, possibly around the start of the third century. Both the west and more extensive east parts of the vicus comprise rectilinear enclosures laid out along main roads leading from the fort with smaller roads branching off from them. Some of these enclosures, particularly those along the main roads, would have contained shops, houses and other buildings. Other enclosures are likely to have been paddocks and small fields.

A third possible fort, of even earlier date, has been suggested to the north of the main site on the edge of the saltmarsh, where cropmarks of part of a double-ditched enclosure have been recorded. Although these have previously been considered as a possible fort, a non-military interpretation is equally plausible (NHER 1004). Although some of the cropmark evidence for the Brancaster fort and vicus has previously been manually transcribed (Hinchliffe & Green 1985, fig. 2), the NMP mapping has significantly enhanced the earlier plots by adding new features and a greater level of detail.

#### *Caister-on-Sea (?Gariannonum/Garannum) (NHER 8675)*

The fort at Caister-on-Sea was probably constructed in the early 3rd century. It has a similar square plan to the latest visible phase at Brancaster, but is slightly larger covering 3.5ha (Gurney 2002, 21). The Caister fort lies on the south side of the Isle of Flegg overlooking the mouth of the Great Estuary. The modern setting of the Caister fort differs from that of Brancaster and Burgh Castle in that much of the area of the fort and its surroundings was covered by housing developments in the 20th century. Although numerous aerial photographs

taken prior to this encroachment were examined during the mapping, cropmark evidence at Caister is sparse. No evidence of the fort or its immediate surroundings is visible on the aerial photographs, except for those taken during the 1950s excavations and those showing the subsequently consolidated remains on display. The lack of cropmark evidence immediately surrounding the fort is likely to be due in part to a thick colluvial deposit that has been identified in various excavations to its south and east (Albone 2006, 33). This deposit has buried the Roman land surface to a depth of up to 0.8m and is likely to have precluded the formation of cropmarks.

A complex group of ditch cropmarks are present 80m to the west of the fort and extend for over 700m to the southwest (NHER 27513). These include a curving ditch-defined road apparently leading to the west gate of the fort with an incomplete group of rectilinear enclosures to its south. It is clear from the form of these cropmarks that the part of the vicus to the west of Caister fort did not have a regular planned appearance like that at Brancaster. A concentration of Roman coins recovered by metal detecting prior to the construction of Caister bypass (in the vicinity of these cropmarks) dated mainly from the late 2nd to late 4th centuries, suggesting activity contemporary with the fort. A less coherent group of cropmark enclosures continue to the southwest and appear to relate to more than one period of activity. Part of a 1st-century AD enclosure was excavated just to the north of the cropmarks, suggesting an early Roman, or Iron Age date, for some of the enclosures. The presence of pre-fort settlement activity might explain the lack of a planned vicus to the west of the fort, with existing enclosures being adapted instead.

#### *Burgh Castle (?Gariannonum / Garannum) (NHER 10471, 49204-5)*

The fort at Burgh Castle is located at the northwest corner of the Lothingland peninsula on the south side of the Great Estuary (Fig. 8.1). It is structurally the most complete of the Norfolk forts with three of its walls surviving to their original height. It differs significantly from the Brancaster and Caister shore forts in that it has a trapezoidal, rather than square, plan with external bastions, six of which still survive. These differences reflect its later construction date, probably some time after AD 260, and result from advances in Roman military technology by that date (Pearson 2002, 17).

Extensive cropmark evidence has been recorded around and within the fort (Fig. 8.3). This had not previously been accurately plotted and as a result of this the NMP mapping has revealed significant new information about the site. However, the presence of both Saxon and medieval activity at the site makes some of the cropmark evidence difficult to interpret.

Some details of the interior of the fort are visible as cropmarks, mainly on CUCAP aerial photographs dating from 1949–56 and 1976. Cropmarks relating to the walls of at least two buildings are present in the northern part of the fort along with ditch-defined enclosures or



further structures. The course of the road leading into the fort from the east gate is marked by cropmarks of two short sections of wall, continued by ditches. In the southeast corner of the fort is a rectangular enclosure cropmark aligned parallel to the fort walls. It is possible that this is also a Roman feature, although it could equally be of later date. Immediately to its west, filling the southwest corner of the fort, is the ditch of the medieval motte and bailey castle that was located at the site.

Outside of the fort walls large areas of complex multi-period cropmarks were mapped. The main area of the vicus appears to have been located over 200m to the east of the fort walls. This is in marked contrast to Brancaster where the vicus extended almost up to the fort. This eastern part of the Burgh Castle vicus consists of rectangular enclosures and trackways which have broadly the same alignment as the fort. This suggests a certain degree of planning in the establishment of the vicus, although it is clearly not as regular as the one at Brancaster. Further to the north a series of large rectilinear enclosures were present. These overlapped and clearly represented several phases of activity. Excavations have confirmed that Roman enclosures extended as far north as St Peter and St Paul's Church (Wallis 1998). Skirting the western edge of the vicus cropmarks is a roughly curving north-to-south aligned ditch. To the southeast of the fort, its alignment appears to continue as one of three possible trackways forming a roughly triangular group of enclosure and pit cropmarks. The other trackways lead towards the fort and the estuary. Limited excavations in this area (NHER 11605; Phillips 1999) have produced pottery and tile of 3rd- to 4th-century date suggesting that these cropmarks form a separate part of the vicus. However, their irregular form means that an Anglo-Saxon or medieval date has also been suggested. Other cropmarks of rectilinear enclosures and field boundaries are present in the area between the vicus and fort and underlying the other cropmarks. It is likely that these also relate to post-Roman, or in some cases, pre-Roman, activity.

### **8.2.3 Lost Military Sites on the Norfolk Coast**

A large and very obvious gap exists in the circuit of Roman defences on the north and northeast coast of Norfolk. The high rate of erosion along much of this section of the coast would mean that any fort or other establishment originally present would now have been lost to the sea. Although it has been suggested that another shore fort might have been present, the evidence from the *Notitia Dignitatum*, a late 4th-century document that lists the names of the forts, indicates that all of the sites are probably known. It is perhaps more likely that a series of lookout posts or signal stations covered the gap between Brancaster and Caister-on-Sea. Sites at Warborough Hill (NHER 1865, Stiffkey) and Gramborough Hill (NHER 6214, Salthouse) have produced Roman artefacts and have previously been suggested as possible locations for such installations. However, no evidence of signal stations at these sites, or anywhere else within the Coastal Zone, was visible on aerial photographs examined during the NMP mapping.

### 8.3 Roman Roads

Roman roads are one of the most distinctive pieces of evidence in the landscape relating to this period. They lend themselves well to being studied through aerial photography. Their straight alignments, usually with a ditch-defined and metalled carriageway, makes them easy to identify as cropmarks (Wilson 2000, 158-9). Because the majority of the Roman road network is, rightly or wrongly, assumed to date to the early Roman period, the main roads in the county do not appear to relate to the location of the shore forts. It is possible that some early roads led to military sites on the coast, but the location of these is not known. Two major Roman roads in the county definitely extend into the Coastal Zone with other possible routes also present.

The Peddars Way (NHER 1289), arguably the best-known Roman road in East Anglia, extends from the coast at Holme-next-the-Sea for 78km southsoutheast to Ixworth in Suffolk (Margary 1973, 258-61). The function of this road is uncertain, although it is usually assumed that it led to a ferry point for crossing The Wash to a now lost fort or town at Skegness in Lincolnshire (Whitwell 1992, 51-2).

Assuming that the road extended all the way to the modern shoreline, and this is by no means certain, just under 10km of its route lies within the Coastal Zone. Entering the Coastal Zone from the south, almost all of the first 7km of the Peddars Way is defined by modern roads and footpaths. At only one location in this area, where the modern footpath deviates from the line of the road, is its course visible as a cropmark. This is at Sedgeford where a 675m long section of the road is visible as a cropmark of a metalled surface flanked by broad roadside ditches (NHER 43419). To the north of Ringstead village the course of the road becomes uncertain and several possible routes to the coast have been suggested. No evidence of a Roman site on the coast at the end of the Peddars Way was revealed by the NMP mapping and it has presumably been lost to erosion.

Two sections of linear cropmarks on the approximate alignment of the road were recorded by the NMP. The first of these starts 170m to the north of where the road disappears at Ringstead and extends for 410m on a slightly curving course (NHER 1289). Its alignment corresponds to kinks in two post medieval field boundaries with the curve at its northern end taking the road away from its straight alignment further to the south. This cropmark corresponds to the course of the road shown on maps of Ringstead dating to 1690 and 1724, and it is probable that it represents a post-Roman alteration to the route. Further to the north a straight section of linear cropmark representing a metalled surface flanked by ditches was mapped (NHER 26906). This cropmark extends for approximately 350m on a very similar alignment to the straight course of the road further to the southeast. It lies between two of the projected routes for the road and adds a third possible course (Fig. 8.4).

The second major Roman road lies approximately 17km further to the east and forms the western boundary of Holkham Park for most of its course within the Coastal Zone. This road (NHER 1791) extends south from the coast to a settlement at Toftrees (NHER 7112, Dunton). It survives as a lane for most of its course through the Coastal Zone and, although it stops short of the coast, its northern section was not visible as cropmarks. A possible Roman road had been suggested by the Ordnance Survey (NMR Linear 439) following a mainly straight modern road between North Walsham and Mundesley in northeast Norfolk (NHER 41037). However, the cropmark evidence relating to this road was inconclusive and it was not possible to confirm its origin.

Only one possible new Roman road was recorded in the Coastal Zone. It was located in the parishes of Belton with Browston and Bradwell on the Lothingland peninsula (NHER 43591). Cropmarks of parallel linear ditches and banks or a metalled surface are visible for 1.6km on a westsouthwest to eastnortheast alignment (Fig. 8.5). To the southwest of the cropmarks their alignment is continued in the modern landscape by a minor lane. The alignment of this feature is mirrored by a large area of field and enclosure cropmarks to its north and south (NHER 43592). This similarity suggests that the fields are, in origin at least, associated with this road. Approximately 1.6km to the southeast of the road is a further area of cropmark field boundaries which share its orientation (NHER 43495). These cropmarks form an area of coaxial and planned fields, which have been interpreted as being Roman, possibly mid to late Roman, in date, see Section 7.2 and Case Study IX for details. Both the road cropmarks and the northern group of field system cropmarks are cut by Browston Lane and the main A143 Beccles to Great Yarmouth road. The Beccles road is shown on Hodkinson's Map of Suffolk dating from 1783 (Hodkinson 1783) and also appears to be marked on Robert Morden's county map produced for the 1695 edition of Camden's *Britannia* (Camden 1722). In view of this, there is every reason to assume that the Beccles road probably has a medieval origin. The relationship of the cropmarks to this road supports their early, and probable Roman, date. The function of the possible road is uncertain. Whilst it is apparent from the NMP mapping that it was associated with a landscape extensively covered by fields and smaller trackways in the Roman period, its end points are unknown. The angle of the road, cutting across the Lothingland peninsula, would suggest that it extended from the coast at Gorleston to the edge of the Great Estuary somewhere to the north of Fritton. The lack of relationship between this road and Burgh Castle shore fort to the north is not surprising. It is possible that the road was laid out in the early Roman period, by the mid 2nd century, over a hundred years before the fort was constructed. Some elements of the post medieval field pattern are also apparently aligned on the road. However, it is not unusual for the alignment of Roman roads to be preserved in later field boundaries and this does not diminish the likelihood of the road being Roman in origin.

## 9 Anglo-Saxon (AD 410 – 849)

Norfolk is of great importance to the study of the Anglo-Saxon period, not least because of its position on the North Sea coast, at the forefront of any cultural or physical migration from the continent occurring in the 5th to 6th centuries. It is slightly later, during the middle Anglo-Saxon period, that Norfolk becomes a definable entity, representing as it does the land of the 'North Folk' within the Kingdom of East Anglia. Its importance also stems from the wealth of recorded sites and artefacts of this period with chance finds and cemeteries in the county having been described since the mid-17th century (Browne 1658 cited in Meaney 1964, 184). More recently the county has benefited from a positive relationship between archaeologists and metal detector users which has led to an increase in the numbers of Anglo-Saxon period artefacts and new sites being identified.

This chapter will examine only the early and middle Anglo-Saxon periods. The late Anglo-Saxon period has more in common with the medieval period, which is dealt with in the following chapter.

Early to middle Anglo-Saxon settlements are archaeologically less visible than their immediate Roman predecessors and, although they have more in common with late prehistoric sites, they are more poorly understood. This makes them difficult to identify through aerial photography and as a result they are under-represented in the cropmark record. This is partly due to the variety of different forms of enclosure associated with Anglo-Saxon settlements still being poorly understood (Higham 1992, 127; Reynolds 2003, 98).

Grubenhauser or sunken-featured buildings are the most distinctive of Anglo-Saxon settlement evidence visible as cropmarks. These rectangular to sub-rectangular pits are present in large numbers at some sites. However, their simple rectangular form means that they can easily be confused with gravel extraction pits. Rectangular halls, the other principal early to middle Anglo-Saxon building type, only show as cropmarks in exceptional circumstances. Even when such rectangular structures are visible as cropmarks, their form is not always distinctive enough to positively identify them as being of Anglo-Saxon date.

The difficulty of identifying settlements of this period from the air is illustrated well by two excavated sites within the Coastal Zone. A total of eleven grubenhauser was excavated at Witton (NHER 1009) between 1961 and 1973 (Wade 1983). No trace of the grubenhauser or any other features that could be confidently associated with the settlement were visible as cropmarks. This would not be surprising, were it not for the cropmarks of two, probably Bronze Age, ring ditches that were clearly visible within the area of the settlement on photographs from several different years. Although localised geological changes may be

partly responsible for the invisibility of the Anglo-Saxon features, it does not appear to be the sole reason in this case. Further grubenhauser were excavated at another site at Witton (NHER 16641) where, once again, they were not visible as cropmarks. These grubenhauser were located in an area where undated, possibly Anglo-Saxon, linear ditches (NHER 39214) and a Roman farmstead and field system (NHER 39212) were present as well-defined cropmarks. The position of the early Anglo-Saxon settlement evidence within the area of the Roman field system raises the possibility of continuity of activity at this site.

Possible grubenhauser were mapped at only eight sites within the Coastal Zone including East Ruston (NHER 38600), Filby (NHER 27619) and Titchwell (NHER 26745). The identified sites vary in form, with some containing a few irregular features while others possess a higher number of more convincingly rectangular pits. There is no artefactual evidence from any of the sites with possible structural remains to support their interpretation as Anglo-Saxon settlements. Only one possible rectangular structure was recorded (NHER 49210, Burgh Castle), but it is more likely to be of Late Saxon date and is included in the discussion of Late Saxon and medieval settlement in Chapter 10.

The identification of settlement sites from aerial photographs where these structural elements are not visible is even more problematic. As mentioned above, this is mainly due to the poor understanding of Anglo-Saxon enclosure types. Cropmarks of unusual enclosure complexes were identified at several locations in the Coastal Zone including Brancaster/Burnham Norton (NHER 27060), Snettisham (NHER 27735), Stiffkey (NHER 38628) and Burgh Castle (NHER 49205, 49209). They comprised a mixture of rectilinear and curvilinear enclosures that were not characteristically Roman or Iron Age in form. Their irregularity meant that they were tentatively identified, with a fairly low degree of certainty, as possible Anglo-Saxon settlement sites. Although possible Anglo-Saxon pottery has been found in association with one of the sites (NHER 13010, Snettisham), the presence of Roman and medieval artefacts means that the dating of the cropmarks is far from conclusive.

Although numerous Anglo-Saxon cemeteries are recorded in the Norfolk landscape they proved to be as elusive as the settlements during the NMP mapping. Individual graves or groups of graves rarely show as cropmarks and such sites, even when known to exist, usually have no visible remains on aerial photographs. Possible Anglo-Saxon graves were recorded at only one site, at Holt, where the ring ditch of a probable Bronze Age round barrow (NHER 36782) was mapped at the location of a known Anglo-Saxon cemetery (NHER 31172). Cropmarks of four pits, possibly graves, were recorded inside the ring ditch. These could relate to Bronze Age burials or possibly secondary interments of Anglo-Saxon date. Anglo-Saxon cemeteries are often associated with earlier monuments, most frequently prehistoric round barrows (Williams 1997, 6-7). It is possible, but less likely, that the barrow represented by the ring ditch was itself of Anglo-Saxon rather than Bronze Age origin.

### **Case Study X: Settlement Evidence at East Ruston (NHER 38600 & 36758)**

Cropmarks of a possible Anglo-Saxon settlement are present in two areas close to St Mary's Church at East Ruston (Fig. 9.1). The best-defined area lies between 300m and 500m to the northeast of the church where over thirty rectangular and sub-rectangular pits were identified. These were clustered into four small groups scattered along a slight ridge. The pits varied in size from 2m by 1.5m up to 7.5m by 4.5m, which covers the full range of grubenhauser sizes present at excavated sites (Tipper 2004, 64). The broad uniformity of their alignment, mostly west to east, is also a feature recognised at other settlement sites. Several of the pits appear to overlap, suggesting multiple phases of activity. One of the possible grubenhauser is crossed by the cropmark of an enclosure or field boundary ditch of unknown date. The four separate foci within this area perhaps indicate that it may have been a small settlement that shifted its location over time, as has been shown to be the case at West Stow in Suffolk (West 1985) and Mucking in Essex (Hamerow 1993).

To the southwest of the church is an area of cropmarks that includes rectilinear enclosures, linear ditches and further possible grubenhauser (NHER 36758). The pits at this site are more variable than those to the northeast. Nineteen pits of sub-rectangular and sub-oval form are visible, ranging in size from 2m by 1m to 20m by 11m. They are present on a number of different alignments and it is possible that some or all are extractive pits. The position of this second group of cropmarks adjacent to the church may indicate a later phase of settlement, perhaps extending from the middle or late Anglo-Saxon period into the medieval. Because of the potentially broad date range for the site it is not possible to speculate to which phase of settlement activity the rectilinear enclosure and linear ditch cropmarks belong. However, it is tempting to suggest that these two groups of cropmarks represent a settlement that has early Anglo-Saxon origins, represented by the grubenhauser to the northeast, and has gradually shifted to the southwest to a location later occupied by the medieval church (NHER 8249). The surviving church is mainly 14th century in date, although it probably has Norman origins, and now stands in a completely isolated location.

# 10 Medieval and Post Medieval (AD 850 – 1900)

## 10.1 Introduction

For the purposes of this report, sites of Late Anglo-Saxon, medieval and post medieval date are discussed together. As with preceding periods, many of the sites mapped by the NMP cannot be dated specifically to one period or the other. Field systems, for example, may display characteristics usually associated with the medieval period even while some of their components are depicted on 19th-century maps. In any case, a substantial proportion of sites may have been in use in both periods; moats may not have been abandoned until the post medieval period (if then), and sites relating to land drainage and reclamation may be the product of centuries of piecemeal additions and alterations.

Sites of medieval and post medieval date represent a substantial portion of the NMP's work. Features of known, probable and possible medieval to post medieval date were present at 1728 of the sites mapped by the NMP within the Coastal Zone; this represents almost 40% of all sites recorded by the project. The sites are widely spread across the study area, with slight concentrations along the coastal fringes and on damp, low-lying ground, where drainage systems and other wetland features of post-Roman date dominate the aerial archaeological record. Elements surviving as earthworks were recorded at 913 sites or just over half of those mapped. Such sites are notably scarce in the northeast of the county, but overall this relatively good preservation is in marked contrast to sites from earlier periods, which are principally known from their crop- and soilmarks. It almost certainly reflects the more substantial nature of some of the medieval and post medieval features, e.g. moats and sea defences, and also their comparative youth – many have been disused for only hundreds of years or even just decades. At the same time, it should be noted that often this preservation only extended long enough for the sites to be recorded on the consulted aerial photographs (i.e. in most cases until at least 1946). It is not unusual to find that earthwork sites visible on 1940s or even 1960s photographs have been plough-levelled in the later decades of the 20th century.

With sites of this period, it has often been possible to relate the NMP mapping to earlier archaeological work at a site, documentary records or historic maps. In some cases the NMP has added significant new information to previously recorded sites. At several of the sites surveyed by Brian Cushion as part of the Norfolk Earthworks Survey project (Cushion & Davison 2003) it has been possible to add further detail or transcribe the greater extent of a site. This is either from earthworks visible on historic photographs but since levelled, or from cropmarks visible from the air but not apparent to a ground-based surveyor. This is not to say, however, that the NMP interpretation or even mapping of such sites is definitive. Certainly, the

limited scope of the project does not allow the time to fully integrate all possible sources for a particular site. The sites belonging to this period that have been mapped by the project would provide fertile ground for any further work in this respect.

The sites are discussed below, grouped into categories (industrial sites, defences, settlement, field systems and enclosures, etc.) based on their dominant character or type, for ease of reference and for reasons of clarity. This is not to say that each class of site was isolated or divorced from contemporary features of different types. Frequently evidence of settlement, for example, was found in conjunction with the remains of the agricultural landscape which once surrounded it. It is beyond the scope of this report, however, to analyse such relationships in detail for the sites overall, although undoubtedly such work would prove productive. They are summarised in the text below where relevant to the description of an individual site, or where they provide a useful example for the more broad-based discussion.

## **10.2 Medieval Religious Sites**

### **10.2.1 Monastic Sites**

The substantial nature of many religious houses, with large ranges of stone buildings for example, means that they generally survive well in the archaeological record. Aerial photography has long been recognised as a useful medium through which to study these sites, especially those with standing remains or earthworks (Knowles & St Joseph 1952). Unlike other parts of the country, such as North Yorkshire, monastic sites with standing remains are comparatively unusual in Norfolk (Williamson 2006, 132). This is a reflection of their post-Dissolution history, with the fabric of their buildings being robbed to provide a ready source of building materials in stone-poor East Anglia. However, many of the sites survive well as earthworks, with features such as fishponds being particularly prominent.

Norfolk had over 100 religious houses during the medieval period (Meeres 2001). These varied in both size and type, with all the major religious orders, and several minor ones, represented. The larger monastic sites were generally the earliest, with pre-Conquest Benedictine origins. Post-Conquest establishments usually related to the new orders, such as the Augustinians and Cluniacs (Williamson 2006, 132). As is common elsewhere, the sites were frequently located in remote, wet or otherwise peripheral parts of the landscape. The distribution of monastic sites in Norfolk is weighted towards the north and west of the county, with a greater density present in a broad band between Downham Market and Wells-next-the-Sea than is apparent elsewhere. The evidence for Anglo-Saxon monastic sites also appears to reflect this pattern (Pestell 2005, 66-7).

Eight monastic sites were recorded by the Norfolk NMP within the Coastal Zone. Five of these were priories of different orders and sizes. Augustinian priories were present at Hickling (NHER 8384), Beeston Regis (NHER 6349) and Burnham Overy (NHER 1774 and 27829),



with the latter including a hospital. More unusual orders were represented by the Cluniac Priory of Bromholm at Bacton (NHER 1073), the Trinitarian Priory at Ingham (NHER 8220) and a Carmelite Friary at Burnham Norton (NHER 1738). Enclosures possibly associated with a monastic grange, attached to the Cluniac priory at Lewes in Sussex, were recorded at Heacham (NHER 27731). The probable site of a Benedictine cell at Fring (NHER 1631) was the smallest of the monastic sites mapped in the Coastal Zone. Other small religious houses are known to have existed in the Coastal Zone, but they were not revealed on aerial photographs. Medieval monastic sites were also present within the walls of King's Lynn and Great Yarmouth. Standing remains are associated with a few of these sites (e.g. Greyfriars, Great Yarmouth, NHER 4297) but the aerial photographs added no new information and they were not mapped by the NMP.

The monastic sites recorded in the Coastal Zone are represented by a mixture of cropmarks, earthworks and standing remains. From a mapping point of view, the best results were generally achieved at the larger religious houses, such as Bromholm and Hickling (see Case Study XI below) where the cropmark evidence could be interpreted alongside standing remains. At Bromholm, cropmarks revealed ranges of buildings, enclosures and internal divisions within the precinct area. A medieval road, field boundaries, and pits or possible structures were recorded to the southwest of the precinct, providing an insight into the landscape setting of the priory.

#### **Case Study XI: Hickling Priory (NHER 8384)**

The Augustinian priory at Hickling, dedicated to St Mary, St Austin and All Saints, was founded in 1185 by Theobald de Valognes. It is situated on a low island, referred to as Erveslund, surrounded by former marshland. The polygonal, sub-circular island defines the extent of the precinct (Fig. 10.1). Although the setting of the priory is reminiscent of Anglo-Saxon monastic sites, fieldwalking of most of the island produced no evidence of this date, suggesting that the priory was a solely Norman foundation (Pestell 2004, 203).

NMP mapping of the site has revealed additional features to those previously transcribed and has altered the interpretation of some of the structural components of the site. The aerial photographs reveal the location of many of the ranges of monastic buildings. These include the cruciform church, where the nave, aisle and chapels can clearly be seen, separated by piers and arch bases, as cropmarks. The nave and aisles are 18m wide and the overall length of the church is between 60m and 65m. To the south and east of the cloister are the remains of several other building ranges, including the possible chapter house, with a possible tapered eastern end or angled east wall. The clearest of the wall cropmarks are of the southern end of the east range, which shows a rectangular block, measuring 26m by 7m, with several dividing walls and conjoined cells. To the south of the main building ranges is a smaller rectangular building measuring 22m by 12m. The cropmarks indicate a number of internal divisions,

possibly with sunken areas in between, suggested by darker cropmarks. This building appears to be linked to a pair of leats or drains and its position suggests that it may have been a latrine or possibly the kitchen range. If the latter is the case, octagonal or circular features visible built into the walls may be large bread ovens or hearths.

To the immediate north of the church and present-day farm is a series of cropmarks of probable walls enclosing a rectangular area measuring 46m by 23m. The main element, which is up to 7m wide, may represent a compacted path or walkway surrounding an area of gardens or vegetable plots. In the northwestern part of this feature are four pits or slots. A group of three extremely neat, rectangular cropmarks are visible to the south of this area on aerial photographs taken in 1954. These are referred to in the Scheduling entry as possible fishponds. Their appearance, however, gives the impression that they are actually of modern agricultural origin and consequently they were not mapped. Evidence of possible extraction or levelling is represented by the cropmarks of a series of angular and inter-cutting blocks in this area.

The precinct boundary is clearly visible as the cropmark of a ditch around the southern edge of the island. A large number of linear features are present within the precinct. It is likely that many of these were leats and drains providing the site with fresh water and removing waste. Two large parallel channels surround the eastern end of the cloisters and church, linking with the possible garden area to the north. One main water management system can be seen to the southwest of the site, on the north side of the moat-like precinct boundary. The system appears to have several channels and a possible structure associated with it. Located adjacent to the precinct boundary in the southern part of the site are a number of rectangular cropmarks, probably relating to fishponds or similar features.

To the north of the main priory buildings are a series of field boundaries and drains, including a trapezoidal enclosure. These are consistent with those marked on the 1842 Tithe Map and may have their origins in the internal layout of the precinct. Cropmarks of an apparently earlier set of enclosures and fields, oriented on a roughly northwest-to-southeast axis, have been recorded in the northern part of the site (NHER 45224). However, in the absence of any pre-medieval finds from fieldwalking this part of the island, it is not clear whether these relate to earlier, possibly Roman activity, or to an early phase of the priory's development.

The earthworks surrounding a sub-rectangular pond located within the southeastern part of the precinct were shown to be of modern origin. These were not present on 1946 aerial photographs, although it is possible that a fishpond did exist at this location. The enclosure containing the pond appears to continue on the southeast side of the precinct boundary and is associated with sunken areas, possibly relating to turf or peat extraction (NHER 43707). The surprising relationship to the precinct boundary makes the date of these features uncertain.

### **Case Study XII: Site of a Probable Benedictine Cell, Fring (NHER 1631)**

The probable site of a Benedictine cell belonging to the Cathedral Priory of the Holy Trinity at Norwich is recorded at Fring in northwest Norfolk (Fig. 10.2). It was founded in the early 12th century but its subsequent history and development is obscure (Blomefield 1809, 303). Aerial photographs show that the site survived as earthworks until at least 1964 but had been ploughed by 1973. After this date, various elements of the site have shown as soilmarks and cropmarks at different times.

The cell comprises a rectangular enclosure located on the valley floor of the River Heacham. The present route of this watercourse, along a straight drain to the northeast of the enclosure, post-dates the Fring Tithe Map of 1838. Originally it followed a meandering course through the enclosure and along the valley bottom (shown in blue on Figure 10.2). The enclosure measures 159m by at least 97m internally and appears to have been defined by walls on at least three sides.

Cropmarks of four rectangular buildings, each measuring approximately 10m by 5m, are present within the enclosure. Two of the buildings are conjoined, forming an L-shaped plan. Banks, visible as earthworks and later as cropmarks, are present on a perpendicular alignment to the southwest and northwest walls of the enclosure. These appear to represent walls with rectangular sunken areas in between. The sunken areas show as strong cropmarks after the field has been ploughed. It is possible that these relate to areas of cultivation within the walls, possibly terraced into the natural slope of the valley side. Ditch cropmarks are aligned parallel to and roughly 12.5m inside the wall of the enclosure. It is clear that they define a separate area around the inside of the enclosure walls, but its function is unknown. Other ditches appear to sub-divide the enclosure.

To the north of the enclosure are linear ditch cropmarks, possibly relating to field boundaries associated with the cell. Also present is the cropmark of a sub-oval pond. This pond is shown on the 1838 Tithe Map as being linked to the river and it could well have been a fishpond belonging to the cell.

An earthwork, and later a cropmark, of a linear bank or wall appears to continue the line of the southwest side of the enclosure to its southeast. However, it is possible that this is connected to other earthworks and cropmarks, relating instead to Fring village (NHER 43438). Although the cell's enclosure appears to lie neatly between a road and the course of the river, this is very much a product of post medieval landscape changes. The repositioning of the river from the valley bottom to its present course to the northeast of the enclosure has been mentioned above. However, the road too has 19th-century origins, and is not marked on the county map published by William Faden in 1797 (Faden 1797). At that time the road lay on the opposite side of the enclosure immediately to the northeast of the present course of the river. This

change is likely to have occurred around 1807 when the park around Fring Hall (NHER 45487) was established and the village to the southeast was re-planned as a consequence. The missing northeast side of the enclosure probably fronted onto, and was accessed from, this earlier road.

Cropmarks of two Bronze Age ring ditches lie on the valley sides to the northeast (NHER 12157) and southwest (NHER 43331) of the cell. It is not clear if either of these was still present as an earthwork barrow in the medieval period. If so, it is possible that the cell was deliberately sited in relation to these monuments, as churches and religious houses were sometimes located to suppress pagan landscape features (Aston 1985, 50).

### **10.2.2 Churches and Chapels**

At the time of the Domesday Survey, population density in Norfolk was relatively high. Unsurprisingly, medieval churches are consequently numerous, with around 1000 being constructed during the period. Although only about one third of these are recorded (in some form) in 1086, it is likely that most were in existence by that date (Batcock 2005, 58). The large number of medieval churches constructed in the county as a whole, and subsequent changes to the settlement pattern, have resulted in an unusually high level of abandonment. Within the Coastal Zone eighty-four medieval churches survive as complete, or substantially complete, buildings either in use or in a disused state. A further six survive in a ruinous condition and at least twenty-one are either lost (some through coastal erosion) or have no above ground remains.

Although a significant number of surviving churches will have undergone remodelling during their lifetime, it is surprisingly rare for evidence of their earlier plans to be revealed as cropmarks or earthworks within the churchyard. Only one instance of this was recorded within the Coastal Zone, at the former priory church of the Holy Trinity at Ingham (NHER 8220). Parchmarks to the south of the nave define part of St Mary's Chapel, which formed a south transept to the church and was demolished in 1779 (Pestell 1991, 19).

Ruined churches with standing remains produced varied results. Standing masonry was recorded at several sites such as St Mary's at Burgh St Margaret (NHER 8647) and St Margaret's at Bayfield (NHER 6162). In one case, St Mary's at Stiffkey (NHER 1887), the former church was only visible as a sub-rectangular earthwork mound within the churchyard of the surviving church of St John the Baptist. In many ways disused church sites do not provide good opportunities for the identification of archaeological features from aerial photographs. Earthworks and even substantial masonry remains are frequently concealed by vegetation due to the overgrown condition of the former churchyard, as was the case with St Peter's Church at Ringstead (NHER 1344).

The impact of coastal erosion on the archaeological record has been discussed in Chapter 2, along with the fate of St Mary's Church at Eccles on Sea (NHER 8346). Remains of this church, the most recent example in what may have been a long history of lost churches on the Norfolk coast, are present on the beach and were recorded by aerial photography following storms in 1991 (Fig. 2.3; see also Chapter 2).

It was at completely abandoned locations on land, where no surface remains survived, that the clearest results were obtained from aerial photographs. These sites are under arable cultivation and partial or complete plans of medieval churches have been recorded from cropmarks. Three such sites were located within the Coastal Zone. Cropmarks of a two-celled building, corresponding to the nave and chancel of St Peter's Church, were recorded at Burnham Thorpe (NHER 1757). A small rectangular building within a rectilinear enclosure at Witton possibly relates to the Chapel of Our Lady (NHER 27233), mentioned in a document of 1524 (Lawson 1983, 85). The most complete plan was recorded at the site of St Peter's Church, Ormesby St Margaret (NHER 8648).

#### **Case Study XIII: St Peter's Church, Ormesby St Margaret (NHER 8648)**

St Peter's Church was one of five medieval churches in the combined parish of Ormesby-cum-Scratby. Two, St Peter's and St Andrew's, were withdrawn from use at the end of the 16th century because the population was insufficient to support them. St Peter's was in use as a barn in the early 18th century but was subsequently completely demolished (Batcock 1991, 160-1). Cropmarks visible on aerial photographs taken in 1976 and 1980 clearly show the plan of the church and different phases in its development. The building does not lie on a true west-to-east alignment, but is positioned on a more northwest-to-southeast axis. It had a round west tower, a characteristically East Anglian phenomenon that is at its most abundant in east Norfolk (Williamson 2006, 90-1). The rectangular nave and chancel were 6.5m wide and measured 12m and 10m long respectively. Both show signs of external buttresses. Within the rectangular chancel are cropmarks of a smaller, and presumably earlier, chancel with an apsidal end (Fig. 10.3). This earlier plan, combining a round tower, nave and apsidal chancel, is identical to the surviving Norman church at Hales in southeast Norfolk (NHER 10523), and presumably indicates a similarly early 12th-century origin (Batcock 1991, 161). Located 10m and 15m to the east of the chancel are the cropmarks of two sub-rectangular pits, each measuring approximately 2m long. These are aligned west-to-east and may be graves associated with the church. If this is the case, it is unclear why only these two graves show as cropmarks whilst the many others that surely exist around the church do not. Although the church was surrounded by linear ditch cropmarks relating to former settlement activity, none of these appeared to clearly define a churchyard boundary.

### **10.3 Medieval Settlement**

This section takes a broad view of medieval settlement, covering evidence from the Late Saxon to early post medieval periods. This includes settlement sites that are completely

deserted or severely shrunken, perhaps surviving only as an isolated farm, but also archaeological sites on the edge of existing villages, which reflect only a relatively slight change in size or location. The distinction between deserted and shrunken settlements is a fine one, particularly in East Anglia, and both groups are considered together below.

The study and academic recognition of the very existence of deserted medieval settlements in England originated in the mid-20th century with the work of Beresford (1954) and Hoskins (1955). The relatively late genesis of the subject means that aerial photography has played an integral role in its development from the outset. Early attempts at using RAF photography, however, were considered to be 'usually very disappointing' (Allison 1955, 118). A new interest in medieval settlement sites broadly coincided with the start of St Joseph's aerial reconnaissance for Cambridge University, and he recorded numerous sites in Norfolk and elsewhere.

In the Midlands and Yorkshire, where Hoskins and Beresford carried out their pioneering work, nucleated settlement was the norm. Where these sites were abandoned they are often visible as complete deserted villages. The pattern of settlement in Norfolk was very different, with dispersed hamlets and farms scattered across the landscape. Fieldwalking surveys of several places in the county, e.g. Barton Bendish (Rogerson et al. 1997) and Fransham (Rogerson 1995), have shown that these settlements typically originated in the Late Saxon period. They were also frequently subject to a complex process of migration, changing both their form and location in the centuries either side of the Norman Conquest, often moving to the edge of greens and commons (Williamson 2006, 51-2). This settlement shift frequently left the church in an apparently isolated location in the landscape. This mobility, accompanied by a decline in population in the later medieval period, accounts for some of the 'deserted' sites. In contrast to the Midlands, where the enclosures of the mid-15th to mid-16th centuries were a major cause of desertion, landlords in Norfolk appear to have caused a gradual process of abandonment by overstocking commons and denying the peasants their pasturage rights (Allison 1955, 140). The creation of landscape parks in the post medieval period was also a cause of desertion (see Section 10.9), although this was often just the final blow to settlements that had already declined (Cushion & Davison 2003, 9).

A recent distribution map of medieval settlement desertion in the county (Davison 2005, 89) shows relatively few sites within the Coastal Zone. The majority of deserted and shrunken settlements are located in a broad corridor through central Norfolk, stretching from roughly Wells-next-the-Sea southwards to Thetford, with a further concentration to the south and southeast of Norwich. Comparatively few deserted settlements are recorded in the Fenland and Broadland areas of the county.

As might be expected, some of the deserted medieval settlements in the Coastal Zone have been lost to erosion. These include Eccles (NHER 8347), Little Waxham (NHER 11909) and Shipden (NHER 11727). On the whole such sites, where most or all of the settlement had been destroyed before the mid-20th century, offer little scope for the air photo interpreter. The only notable exception, and the only one recorded by the NMP, is Eccles, where the church tower remained standing until 1895 and masonry is still present on the beach (NHER 8346, see Chapter 2, Section 10.2.2 above and Section 12.3).

Convincing medieval settlement evidence was recorded by the NMP at thirty sites in the Coastal Zone, with several possible sites also mapped. The sites are distributed evenly but sparsely around the coastal margins, with no obvious correlation to the countywide distribution of deserted sites. The settlement remains vary significantly in their extent and form and are visible as both earthworks and cropmarks. The most extensive sites are those where the settlement was completely or largely deserted and its full area is visible on the aerial photographs. Sites of this type comprise enclosures, building platforms and hollow-ways, and include Little Ringstead (NHER 1115, see Case Study XIV below), Hardwick (NHER 38259) and a series of sites along the valley of the River Stiffkey at Wighton (NHER 1850 & 18560) and Warham (NHER 31528). In a number of cases, e.g. at Hardwick (NHER 38259), medieval settlement remains are associated with a moated site. The moats themselves are discussed separately below (Section 10.3.1).

Cropmarks of rectilinear and curvilinear enclosures relating to tofts and crofts have been recorded next to a number of isolated medieval churches in the Coastal Zone. These appear to relate to Late Saxon and early post-Conquest period settlements that were later relocated. Examples include East Ruston (NHER 8250), Mautby (NHER 42089) and Witton (NHER 27229). Late Saxon to medieval pottery has been found in the vicinity of the cropmarks at Witton, supporting the fieldwalking evidence for the origin of such settlements from Barton Bendish, Fransham and elsewhere. More extensive remains are present at surviving settlement sites. A group of enclosures at Fring (NHER 1078) lies alongside the cropmarks of a road, immediately to the west of the parish church. These too are associated with Late Saxon to medieval artefacts and relate to a part of the village that had disappeared by the late 18th century (Fig. 7.7). A more complex pattern of rectilinear enclosures was recorded, along with former metalled roads, around the site of St Peter's Church at Ormesby St Margaret (NHER 18320). In some cases the history of a settlement is very obscure and the causes of its abandonment are uncertain. Hardwick in North Runciton parish (NHER 38259) is visible on 1940s aerial photographs as the earthworks of a moat and a linear group of rectangular enclosures extending to its south. The settlement is referred to in documents from the 13th and 14th centuries, and its chapel was still standing in 1528 (Batcock 1991, fiche 8:G9), but most of its history is uncertain. In this case aerial photographs are the main source of

information as most of the site has now been built over, with the remainder under arable cultivation.

Isolated minor settlement sites were also mapped at several locations. At Halvergate (NHER 42195) a group of small rectilinear enclosures is visible on the reclaimed marshland in an area that had formerly been part of Acle parish. Their appearance is different to other enclosures in the area and it is possible that they relate to a medieval farmstead. More definite evidence of a medieval to post medieval croft and toft was recorded at Lessingham, where cropmarks of a rectilinear enclosure and building are visible (NHER 38583). A building, probably a house, was marked here on the 1840 Tithe Map, but the surrounding enclosure had gone by that date.

As with the Anglo-Saxon period, the identification of individual buildings as cropmarks within settlements is unusual. Cropmarks of a rectangular post-built structure of probable medieval date were mapped adjacent to a moated site at Roughton (NHER 6747; see Case Study XV below). A second structure was mapped in the area of the Roman vicus and Anglo-Saxon to medieval activity at Burgh Castle (NHER 49210). This possible structure comprised 25 post holes, some apparently linked by trenches, and measured 26m by 12m. It has been suggested that it could be a Late Anglo-Saxon hall, although a medieval date is also possible.

Although NMP mapping within the Coastal Zone has not recorded a large number of medieval settlements, it has added significantly to our knowledge of individual sites. As with so much of the NMP's results, the aerial photographic evidence cannot be taken in isolation; it needs to be considered alongside information from fieldwork, documentary research and artefacts. The value of the mapping lies not only in what it can tell us now, but in the ways it can be integrated into future research.

#### **Case Study XIV: Little Ringstead Deserted Medieval Village (NHER 1115)**

The site of the deserted medieval village of Little Ringstead, also known as Ringstead Parva or Barrett Ringstead, is located in the modern parish of Hunstanton in northwest Norfolk. Part of the site is designated a Scheduled Monument (SM 223). Five separate holdings are recorded at Ringstead in the Domesday Book. However, it is not clear which, if any, of these relate to the Little Ringstead deserted site. Little Ringstead was in existence by 1316, when it is specifically mentioned in the *Nomina Villarum* (a list of settlements and their lords). It seems never to have been a sizeable village, with only seventeen taxpayers recorded in 1332. The already small settlement appears to have been severely depopulated by the Black Death of 1348–9, and was one of only sixteen villages in Norfolk to have been given relief of over two thirds of its tax in the following years. It is likely that the settlement effectively ceased to exist as a village at that time, even though the name was still used in documents into the 15th century (Allison 1955, 131).



The extent of the village is visible on aerial photographs as cropmarks and soilmarks surrounding the standing remains of the church (Fig. 10.4). It comprises a group of rectilinear enclosures, arranged along a southwest-to-northeast aligned hollow-way lying roughly parallel to a small stream valley to its southeast. The enclosures represent the tofts and small fields associated with the settlement, separated by banks, ditches and sunken lanes. Some elements of village's plan survived into the 20th century as field boundaries. The main hollow-way through the settlement appears to correspond to a road called 'Bluegate' on a 1623 map of Heacham (Lewton-Brain 1967, 17). As it passes through the village it has a bank on one, and in some places both, sides of its course. The densest area of cropmarks lies at the northeastern end of the hollow-way cropmark. This part of the settlement is defined by a double-ditched enclosure, measuring 250m by 240m, which is sub-divided into four areas.

Within the western quarter of the enclosure are the standing remains of St Andrew's Chapel, the main fabric of which is of 13th-century date. It had been demoted in status from a church to a chapel by 1530, possibly following the depopulation of village in the mid-14th century. In the early 17th century it was re-roofed and used as a barn (Batcock 1991, fiche 5:E1). The church sits on a sub-rectangular mound, which measures 38m by 32m and is surrounded by a wide ditch. Rectangular enclosures defined by banks are present to the north and west of the church. The northern quarter of the double-ditched enclosure appears to be fairly devoid of features. It is not clear whether this was an open area such as a paddock or whether remains of the settlement were simply not visible on the consulted aerial photographs. Two possible tofts are present, fronting on to the main hollow-way. The area of the double-ditched enclosure to the south and east of the hollow-way contains further small enclosures and a possible building platform, which is sub-rectangular in plan and measures 21m by 37m. A series of parallel ditches are present on a northwest-to-southeast alignment leading away from the hollow-way. It is possible that these elongated strips relate to fields or crofts. The features in the southeastern part of the settlement are cut by a curving bank and ditch leading towards the chapel from the southeast. It is possible that this is a track connecting Downs Farm (formerly Barrett Ringstead Farm) to the chapel.

Surrounding the settlement are cropmarks of further enclosures and fields. Some of these, particularly those immediately to the north of the village (NHER 27160), appear to be of an earlier date. These cropmarks of curvilinear enclosures appear to be associated with a trackway leading into the northeast corner of the medieval village, but could be of an earlier, Iron Age to Roman date. Pottery and other finds of this relatively early date have been recovered from the vicinity of the cropmarks. Metal detecting has also produced artefacts of Middle and Late Saxon date from the area of the village. This suggests that the origins of the settlement lie in the Saxon period and it is possible that one or more of the Domesday Book entries could relate to this site.

### **10.3.1 Moated and Manorial Sites**

The Eastern Region possesses the highest number of moated sites in England, but they are a class of site that has received relatively little attention in recent decades (Wade 1997, 52; Shelley 2003, vii). Forty-five 'moats' were recorded by the Norfolk NMP within the Coastal Zone; the interpretation of fifteen of these sites is somewhat tentative, and eight sites were dismissed or reinterpreted. The moats mapped and recorded by the project represent only a small proportion of more than 800 known from the county, and indeed, even within the Coastal Zone itself, there are a number of additional possible moated sites where no information was recorded from the consulted aerial photographs.

The vast majority of the moats mapped by the NMP are assumed to have supported some type of settlement, although one (NHER 6394, Beeston Regis) probably surrounded a post mill. The impetus behind the construction of moats is still a matter for debate, and this preliminary assessment of the NMP data for the Coastal Zone can offer little in the way of explanation for why certain sites were moated and others not. Fashion is now generally accepted as the major stimulus to moat-construction, with a water supply for fire-fighting and a supply of fish as feasible secondary aims (Rogerson 2005, 68). Given the insecurity of the period, particularly when moat building began, the desire for defence cannot be entirely ruled out as a factor in some cases.

Norfolk's moats are concentrated in the Boulder Clay region, an area barely touched by the NMP's Coastal Zone, but they are also found in smaller numbers in most parts of the county (Rogerson 2005). Those sites that lie within the Coastal Zone are distributed fairly evenly across it, although there is a tendency for sites to be clustered in small groups. There appears to be a slightly greater number of sites in the northeastern region: this could be due to the responsive soils of the area, which may have allowed a greater number of plough-levelled sites to be recorded, but it could also reflect the fact that the area's moats have been the subject of a specific study (Dollin 1986).

It is likely that most of the moated sites recorded by the project date to the medieval period. Generally moats were constructed between the mid-12th century and the 16th century, with most being created during the 13th and earlier 14th centuries (Rogerson 2005, 68). At least one site, formerly known as Ufford's Hall (NHER 38618, Sustead), appears to have originated in the Saxo-Norman period, although the moat itself may have been a later element, added to an existing settlement (Ashwin 1994, 4). Conversely, several of the sites remained in use into the post medieval period, and some still surround medieval buildings (or their replacements), as at Hunstanton Hall (NHER 1117) and Caister Castle (NHER 8671). (The former has been substantially rebuilt; the latter survives only as a ruin.)

Like those just mentioned, many of the sites mapped may have been manorial, or certainly of high status. At the site of Hale's Manor, on the parish boundary between Warham and Stiffkey (NHER 1886), an extensive range of former buildings was mapped within the moat, adding to the plan derived from an earlier earthwork survey (Cushion & Davison 2003, 129). Some moats could relate to manors held by monastic foundations. The grange system may not have functioned as formally, or as extensively, in Norfolk as in other parts of the country, such as Lincolnshire (Andrew Rogerson, NLA, pers. comm.), and few granges are recorded in the NHER, but earthworks possibly associated with a grange site at Heacham (NHER 27731) could include a moated element. At Old Hunstanton the project recorded its only example of a possible non-moated manorial complex, comprising a rectilinear arrangement of banks or walls (NHER 17135). A probable moat at Roughton (NHER 6747) lies close to both St Mary's Church and Manor House Farm, and this too may have been a manorial site. This is not necessarily the case for all of the sites mapped, however, and some may have been fairly humble in character. The excavated moated site at Cedars Field, Stowmarket (Suffolk) was interpreted as a relatively low-status settlement on the basis of the small size of the interior island and the paucity of high-status material from the site (Anderson 2004).

Such variations in the status and rank of moated sites are difficult to gauge from aerial photographs alone, although in Suffolk it has been noted that parsonages and free tenements often occupy platforms measuring about half an acre in extent (Martin & Aitkens 1988). Fishponds recorded at or near twelve of the moats mapped by the NMP, and possible dovecotes identified at two sites, can be taken to mark these as high-status dwellings. One of the main contributions of the NMP, beyond identifying and mapping plough-levelled sites and providing a plan of surviving earthworks, has been to map such ancillary enclosures, structures and other features, often plough-levelled, which lie beyond the confines of the moat itself. Many of Norfolk's moats would have been surrounded by the buildings and yards of a demesne farm, for example, but these less substantial features rarely survive as earthworks (Rogerson 2005, 68).

The sites occupy a variety of locations. Some, such as those at Roughton (NHER 6747) and Sustead (NHER 38618), lie within villages, which are themselves surviving elements of the medieval settlement pattern. A moat mapped at North Runcton is surrounded by the earthworks and cropmarks of enclosures, probably representing the shrunken or migrated hamlet of Hardwick (NHER 38259). Other sites are more isolated, as is the case with Hale's Manor (NHER 1886) and two possible moated sites at Warham to its southwest (NHER 1850 and 13606), although even these lie close to the edge of larger settlements. At many sites the remnants of field systems and ridge and furrow of probable medieval date have been mapped, but it is often difficult to relate the moats directly to these possible relics of a contemporary landscape. At Hunstanton a large moat (NHER 1277) is surrounded by the

earthworks of a probable field system and ridge and furrow, which extend to its east across both sides of the River Hun (NHER 26865 and 28502).

#### **Case Study XV: Roughton (Fig. 10.5)**

A probable medieval moat was mapped at Roughton in northeast Norfolk (NHER 6747). It is one of several moated sites known from the area. Ufford's Hall at Metton (NHER 38618, Sustead) lies 2km to the northwest, and a third possible moat is visible at Northrepps 3km to the northeast (NHER 38799). A fourth site at Southrepps 3km to the east (NHER 23293) has been dismissed, its cropmarks reinterpreted as a product of recent agricultural activity.

The moat lies close to Roughton Common, just to the south of a now largely canalised watercourse, Hagon Beck, and less than 200m northeast of the village church. It still partially survives as an earthwork and the site was surveyed in 1983. Although there is a degree of variation in the width of the arms, morphologically the site resembles a moat, particularly in its appearance on older aerial photographs taken in 1946 and 1969. While alternative interpretations have been put forward – that it represents village shrinkage or the site of a water mill, for example – the suggestion that it is a moat is preferred. Surface finds of various dates, including medieval and post medieval pottery, have been recovered from the site.

The moat appears to have formed a four-sided, trapezoidal enclosure, although its east and north sides are difficult to distinguish from the surrounding pattern of drains and field boundaries. The central platform measures approximately 90m by 68m, and the moat itself is up to 13m wide. The causeway on its south side has the appearance of a genuine entrance. Various internal banks, mounds and ditches are visible, perhaps representing the remains of buildings and yards.

Outside the moat, specialist oblique aerial photography of the area to the south has recorded the cropmarks of a number of ancillary enclosures and boundaries (Fig. 10.5). Foremost amongst these is a large double-ditched enclosure, which is internally subdivided into a number of smaller compartments. Within it a possible post-built building, 12m long and 5.5m wide, can be seen as two rows of pit-like cropmarks. The positioning of the moat within the larger enclosure, and its shared orientation, suggests that the two were contemporary (at least in use if not in construction). Additional boundaries and enclosures visible further to the south are also likely to have been part of the contemporary landscape.

#### **10.4 Field Systems, Ridge and Furrow, and Enclosures**

The post-Roman field systems of East Anglia are regarded as one of the region's distinctive features (Wade 2000, 24). In recognition of this, they have been made the subject of their own separate study, the East Anglian Fields Project (Martin & Satchell forthcoming), in addition to being covered by the national programme of Historic Landscape Characterisation, which is still in progress in Norfolk. The most distinctive regional elements are the individual

enclosed fields typical of what Rackham has named Ancient Countryside (Rackham 1986, fig. 1.3; 4-5), or what can also be termed Woodland (as opposed to Champion) landscapes (Williamson 1988). In Norfolk, Ancient Countryside is predominantly found on the heavy soils of the Boulder Clay Plateau. This area includes the coaxial field system with possible prehistoric origins at Scole and Dickleburgh, identified by Williamson (1987) (see Section 7.2). By contrast, much of the NMP's Coastal Zone lies within Rackham's area of Planned Countryside, where a strong and long-lived tradition of open field agriculture gave way to a highly planned post medieval landscape, as a result of the Enclosure Acts of the 18th and 19th centuries. Only the easternmost part of the Coastal Zone, i.e. the area surrounding the Broads and Great Yarmouth, falls within Rackham's region of Ancient Countryside.

Unfortunately, the extent of the Coastal Zone is too narrow, and the scope of this report too limited, to make a distinction between these two broad landscape types on the basis of the current NMP mapping. It is also the case that at a local level such distinctions become less meaningful, and across large areas of Norfolk more diverse, local systems of farming and land division were developed in response to a variety of local factors (see Williamson 2006 for example), not least the region's uniquely complex manorial and tenurial arrangements, which comprised a high proportion of free and semi-free tenants (Campbell 2005, 52). It can be noted, however, that greater numbers of medieval and/or post medieval field systems are recorded on the light soils of north and east Norfolk, which are highly productive of cropmarks, and in the 'Good Sands' region in the northwest of the county (Williamson 1993, fig. 1.2). Records of ridge and furrow are more common in those areas where few field systems have been recorded. The majority of the latter are of post medieval date and closely associated with drainage (see below), so it is unsurprising to find them clustered on lower-lying ground, close to estuaries, floodplains and coastal marshes. Only when further mapping has been completed, covering a variety of different landscape types, will it be possible to detect broader patterns in the aerial photographic evidence, which can then be related to sub-regional landscape zones.

#### **10.4.1 Field Systems**

The NMP recorded 105 sites of possible, probable and known medieval and/or post medieval field systems within the Coastal Zone. Of these, seventy-eight may have been in use in the medieval period, while ten are recorded as having perhaps originated before or during the Saxon period. The latter group incorporates sites for which there is barely any dating evidence, and those for which nothing more precise than a possible post-Roman date can be given. It also includes, however, a site at Hemsby in northeast Norfolk (NHER 17673 & 27340), where a coaxial pattern of long, sinuous ditches and shorter cross divisions defines a field system evident across an extensive area. This forms part of a multi-period group of cropmark sites, and its morphology and orientation contrasts with that of other field systems of probable Bronze Age, Iron Age/Romano-British, and medieval date visible in the vicinity.

The site of a possible Early Saxon settlement was excavated only 50m to the south (NHER 34025) (Bates & Crowson 2004, 16). At Burnham Market, field boundaries and a field system (NHER 26980) of probable post medieval date surround an excavation site (NHER 32791) where it was demonstrated that a medieval coaxial furlong pattern was based upon the layout of a field system of late prehistoric or Roman date (Percival & Williamson 2005).

Only one possible example of an open field was recorded by the project. This lay on the cliff edge at Hunstanton (NHER 26939), and comprised a series of parallel ditches and banks which may represent the boundaries of former strip fields. Their spacing appears to correspond with the boundaries depicted in a Field Book of 1689, and the mapped features probably represent the first stages in the enclosure of what was previously an open field system. The majority of the sites recorded by the NMP, however, cannot be dated specifically to the medieval or post medieval period. Where their orientation and pattern is at odds with that of the surrounding modern fields, they can usually be assumed to represent the remains of a pre-Enclosure landscape. Other sites seem to fit the same pattern as that depicted on 19th- and 20th-century maps, indicating that they are either later in date – perhaps representing informal late medieval or post medieval enclosure – or that the modern landscape exhibits a certain degree of continuity with earlier field patterns. In most cases, however, the picture is not clear-cut, and what has been mapped represents a palimpsest of land division, the origins of which may date back even as far as the prehistoric period. (Enclosure of very recent date, recorded adequately on readily accessible historic maps, such as the Ordnance Survey 1st edition 6 inch series, has generally not been mapped by the NMP.)

The 100 plus sites mapped by the project encompass a range of different morphological patterns, a fact which is almost certainly a reflection of the varied topographic landscape of the Coastal Zone, and the different factors affecting land division at different sites, in different parts of the county and at different times. Thirty-four of the sites are recorded as having a broadly coaxial pattern. Others have a more regular, grid-like appearance. Six are recorded as having dominant elements which are defined by double-ditched boundaries or trackways, a characteristic which is more typical of the possible Iron Age and Romano-British field systems mapped by the project (Section 7.2).

A proportion of the sites appear to be associated with settlements, such as moated sites or villages, or with other possible elements of the contemporary landscape. Several fields of probable medieval to post medieval date are visible as cropmarks to the southwest of the Cluniac monastery at Bromholm (NHER 1073). The remains of former field systems also surround the deserted medieval village of Ringstead Parva (NHER 1115; see Case Study XIV above) and a possible manorial site at Heacham (NHER 27731). The relationship between a moated site at Hunstanton (NHER 1277) and the field system and areas of ridge and furrow

that surround it is discussed above (Section 10.3.1). In some cases, other features of the historic agricultural landscape are evident, embedded within the field systems. At Knapton, for example, the cropmarks of a medieval or post medieval post mill (NHER 39049) are surrounded by further cropmarks of various dates, including those of what was probably a contemporary field system (NHER 12818).

#### **10.4.2 Ridge and Furrow**

The NMP mapped ninety-nine sites of possible ridge and furrow within the Coastal Zone (Fig. 10.6); this figure includes four sites located along the River Babingley in west Norfolk, which were mapped as part of the Suffolk County Council pilot project but lie outside the area later defined as the Coastal Zone. Ridge and furrow is not a common feature of the Norfolk landscape, or of East Anglia as a whole (Liddiard 1999, 1). It is likely that this is partly due to the light soils that cover large parts of the county, where the earthworks of ridge and furrow can be easily destroyed by subsequent agricultural activity, and where good natural drainage may have obviated the need for this method of cultivation. It may also be the case that traditional ridge and furrow was only ever limited in its extent within Norfolk, reflecting the variety of common field systems functioning in the county compared with the classic three-field system so typical of the Midlands. Variations in ploughing technology and methods, both in the creation of the ridges and in later agricultural regimes, may also have influenced its distribution. It is generally agreed, however, that the picture remains unclear, and that the factors affecting the creation, survival and archaeological recording of ridge and furrow are both diverse and poorly understood (Silvester 1989; Liddiard 1999; Hall 1999, 38-40; Cushion & Davison 2003, 199-200).

The NMP, while mapping a number of new sites, and defining the extent of those that were already known, has done little to throw light on the issue. The distribution of ridge and furrow sites mapped by the NMP clearly shows a higher frequency in the west and northwest of the Coastal Zone. The clustering of sites in the west of the county is a pattern that has been observed before (Silvester 1989, fig. 1; Liddiard 1999, fig. 1), and for which various explanations have been put forward. The majority of the sites mapped by the NMP, however, including those found in the northwest of the county, along the north coast and around Breydon Water in the east, are thought to be of medieval/post medieval and post medieval date. This suggests that the distribution pattern created by the mapping may not reflect the occurrence and survival of medieval ridge and furrow of a traditional kind, but rather that of a variety of later methods for land drainage and cultivation: it is surely no coincidence that many of the sites occupy low-lying sites in river valleys, on coastal marshes and in estuaries (Fig. 10.6).

Of those sites recorded by the NMP, several of possible medieval date have been identified close to other sites of this period. As described above (Section 10.3.1), a contemporary field

system adjacent to a large moated site at Hunstanton (NHER 1277) includes at least two areas of ridge and furrow (NHER 26865 & 28502). Others demonstrate the disuse, or change of use, of earlier features. The Iron Age 'hillfort' of Warham Camp (NHER 1828), for example, has traces of ridge and furrow of unknown date within it. The remains of ridge and furrow or lazy beds are visible on top of a number of the medieval saltern mounds identified in west Norfolk, for example NHER 27130 at King's Lynn and NHER 27860 at South Wootton. This practice appears to reflect the exploitation of the higher ground on top of the salterns, which stood proud of the surrounding marsh, and may date to the later medieval or post medieval period. An area of probable post medieval ridge and furrow on the parish boundary between Warham and Wighton (NHER 38240) overlies the medieval crofts and tofts of a shrunken portion of Wighton village (Cushion & Davison 2003, 83-4). Some of the sites mapped by the NMP may be of particularly late date. Several areas of straight, narrowly spaced ridge and furrow on the marshland surrounding Breydon Water, near Great Yarmouth, could relate to the conversion to arable of some areas of the marsh during the Napoleonic Wars (1793-1815), when grain prices were high (Williamson 1997, 61-2). Map evidence suggests that other sites in this area may be of even later date.

Other cultivation marks mapped by the project consist of two possible examples of lynchets or similar features in the parishes of Fring and Sedgeford in West Norfolk (NHER 43437 & 45061). These might instead represent the boundaries of former medieval strip fields.

#### **10.4.3 Enclosures**

The project mapped and/or recorded 223 enclosures of probable medieval and post medieval date. More than half are visible only as cropmarks, and their distribution is again biased towards the light soils of the east and northeast of the county. The sample provided by the NMP mapping is likely to include sites with a variety of different functions, related to activities such as settlement, agriculture (both arable and pastoral), industry and religion. Thirty-four of the sites (15%), for example, have been interpreted as possible stock enclosures, and twenty-seven are indexed as possible sheep folds. A range of dates is also represented, although as ever with sites recorded from aerial photographic evidence alone, few sites can be closely or definitively dated to a specific period. Six of the sites are potentially of Saxon date, 162 are potentially medieval, and 184 potentially date to the post medieval period. A range of different morphologies is also represented.

It is beyond the scope of this report to analyse this group of sites in any great detail. Those for which a specific function is known, such as probable moats or garden features, are discussed separately in the relevant section of this document.

#### **Case Study XVI: Northrepps Field Systems and Enclosures (Fig. 10.7)**

A multi-phase cropmark site at Northrepps includes an extensive medieval to post medieval field system and associated features, together with a number of unusual enclosures which are



undated and may relate to stock management. The site lies in northeast Norfolk, on a gentle southeast-facing slope, with the head of Mundesley Beck to its east. The cropmarks extend for some 2.5km by 0.9km and reflect several phases of activity.

At the northern end of the site is a possible farmstead (NHER 13063; shown in grey on Fig. 10.7), which is tentatively dated to the Roman period on the basis of its morphology and the fact that finds of this period have been found in the vicinity. The remains of a contemporary field system (NHER 38808; also shown in grey on Fig. 10.7), with a shared northeast-to-southwest orientation, are visible to its southeast, extending (albeit intermittently) for up to 2.5km. A second field system (NHER 38807; green on Fig. 10.7), with a predominantly east-to-west orientation, is visible across much of the same area. Part of it is depicted on Northrepps Tithe Map (dated 1840) but the curvilinear or sinuous nature of several of the field boundaries and trackways that make up the field system suggest that while some elements were undoubtedly in use in the post medieval period, the origins of others may lie in the medieval period. The elongated fields marked 319 and 320 on the Tithe Map (on the upper left-hand side of Fig. 10.7), for example, have a reverse-S outline and are very reminiscent of those created by the enclosure of 'bundles' of strips within former open field systems. The field pattern depicted on the 1st edition 6 inch Ordnance Survey map, which cuts across many of the fields shown on the Tithe Map, suggests a reorganisation of land division over the northern part of the site in the second half of the 19th century.

The northern part of the site is the area most clearly visible on the consulted aerial photographs. Here, several smaller and subdivided enclosures can be seen within the medieval to post medieval field system, and these may have been used for domestic or other specialised purposes. At least three small ring ditches are also visible (NHER 38804, 38805 & 38806; in blue on Fig. 10.7). These are undated and their small dimensions (less than 10m in diameter) and position within the field systems suggest that they could be related features — perhaps stack stands or similarly agricultural enclosures, for example. Whether they are associated with the postulated Roman phase, however, or that dating to the post-Roman period, or whether they are entirely unrelated features, is not clear. (If the former is the case, they could represent round houses.) A similarly tentative interpretation is given for a possible polygonal enclosure of similar dimensions (NHER 38803).

At its southern end, the medieval to post medieval field system overlies a group of at least three rectilinear enclosures (NHER 13064; shown in pink on Fig. 10.7). Their function is unknown, but the two most complete examples possess distinctive annexes around their entrances. They are positioned close to the head of Mundesley Beck, now a dry valley, with their entrances (where visible) facing toward the watercourse. This location might suggest a pastoral function, perhaps related to the seasonal grazing of meadowland. The presence of distinctive annexes next to two of the enclosures implies a need to separate groups of

animals from each other, which in turn suggests that they may have been used for specific tasks, such as shearing, rather than simply as paddocks. Three smaller enclosures, which lie to the east of the annexed features, are also likely to have had an agricultural function. None of the enclosures is dated. While they are overlapped by the medieval to post medieval field system, however, the northernmost enclosure seems also to be respected by it, suggesting that some elements of both sites might be contemporary.

## **10.5 Roads**

Former roads of medieval and early post medieval date were identified throughout the Coastal Zone. Like their Roman counterparts, roads of this period show well as cropmarks of compacted or metalled surfaces, parallel roadside ditches or hollow-ways (Wilson 2000, 158-9). A total of ninety-five sections of former roads of probable medieval to post medieval date were mapped in the Coastal Zone. Perhaps more than any other class of site recorded by the NMP, their interpretation and dating drew heavily on information from historic maps (see Appendix 1 for a discussion of the principal sources). Without doubt the most useful source in this respect was the Map of the County of Norfolk published by William Faden in 1797 (Faden 1797). This shows the landscape of the county before the enclosure of the early 19th century – a time when the course of many roads was altered. Of the roads recorded in the Coastal Zone, thirty-four were wholly or partly shown on Faden's map but were abandoned during the following century.

Maps of 16th- and 17th-century date were available for a number of parishes in northwest Norfolk. These proved to be invaluable in identifying the position of former roads and interpreting the cropmark evidence. In some cases cropmarks which would not otherwise have been recognised as relating to roads could be accurately identified as such from the early maps (e.g. NHER 43397, Markett Way at Sedgeford). A total of twenty of the roads recorded by the NMP were shown on these early maps but most had disappeared by 1797. The evidence from the early maps in northwest Norfolk shows that major changes occurred during the post medieval period, probably as a result of the process of enclosure from the 17th century onwards. Comparison of the cartographic sources shows that the NMP mapping only reveals a small number of these changes, with many former roads not showing as cropmarks.

Several other reasons can be identified for the abandonment of medieval and early post medieval roads. Some of the mapped sections of road related to their straightening during 18th- and 19th-century improvements. Most of these resulted in short sections of former road being abandoned where unnecessary bends and corners were removed. More substantial changes occurred through the work of the turnpike trusts. At Filby cropmarks of a curving section of ditch-defined metalled road are present roughly parallel to the modern line of the A1064 (NHER 42047). The road was the main route between Norwich and Great Yarmouth

prior to the construction of the Acle New Road (now the A47) during the 1820s to the south of the River Bure. The present line of the A1064 at Filby Heath was probably established in 1768–9 when the Norwich to Great Yarmouth route was made into a turnpike road. It is likely that the road was straightened at that time with the cropmarks to its north marking its original, probably medieval to early post medieval, course.

Roads were also diverted when new landscape parks were established around country houses. Within the Coastal Zone evidence of this is present at Cromer (NHER 33460) and Holkham (e.g. NHER 27840 & 27848). In the latter case, at least ten separate sections of road were diverted when the park was laid out around Holkham Hall in the 1720s. In addition, some early diversions to roads were imposed by religious houses. Cropmarks of a ditch-defined road at Ingham (NHER 38573) are likely to represent the old road from 'Pallyng to Staleham', which was relocated in 1365 shortly after the foundation of the adjacent Trinitarian priory (NHER 8220) (cited in Pestell 1991, 13).

## **10.6 Mills and Stack Stands**

Former windmills, or their sites, were a relatively common feature of the NMP Coastal Zone mapping, with a total of forty-eight such sites (or possible sites) being recorded. (The existence of a further possible site at Belton with Browston, NHER 17226, could not be confirmed.) This figure does not include the large number of surviving mills, where aerial photographs contribute little new information and consequently NMP mapping was not undertaken. At a few of the sites where a mill structure still survives, or a late post medieval mill is recorded by maps, the traces of one or more earlier mills are visible on the aerial photographs. At Roughton, in northeast Norfolk, the remains of up to three earlier mills were mapped, in close proximity to the 19th-century tower mill that still stands at the site (NHER 6766). At Winterton-on-Sea, the cropmarks of two probable post mill sites (NHER 43398) lie only 550m to the southeast of a third post mill (NHER 12188). These sites are all presumably predecessors of the 18th-century post mill that stood at Mill Farm, a short distance to the east (NHER 13346).

The identification of windmill sites from their cropmarks or earthworks was often aided by documentary or cartographic evidence. Post mills, which frequently leave a characteristic cross-shaped mark, can be identified with a fair degree of confidence from their morphology alone. Where only an encircling ring ditch survives the interpretation is less clear-cut, and in particular there can be confusion with prehistoric funerary monuments. Hengiform monuments of Late Neolithic and Bronze Age date (discussed in Section 4.5) are of a similar size and have a similar plan to the ditches surrounding some windmill mounds; out of four such sites excavated in Essex, two proved to be possible windmill sites of early medieval date, the remaining two being prehistoric (Brown & Germany 2002). The situation is further confused by the practice – apparently reasonably common in parts of Norfolk – of re-using

prehistoric round barrows as windmill mounds. At several sites the central cross-shape left by a post mill is visible within a ring ditch that is likely to have originally been constructed in the Bronze Age. This is the case with the double post mill site at Winterton (NHER 43398, mentioned above), which encompasses four ring ditches in total, apparently representing a small round barrow cemetery. A similar situation is evident at a site 2.6km to the south in Ormesby St Margaret, where a ring ditch surrounding a cross-shaped mark (NHER 27353) is part of a large dispersed barrow cemetery. In this case the ring ditch had clearly been re-cut, seemingly some time after the ditch was originally constructed as there is a discrepancy in the positioning of the two ditches. This suggests that by the time the postulated Bronze Age mound (inferred by the ring ditch) was re-used as a post mill site, the surrounding ditch was no longer visible. The interpretation of this latter site is further confused by a 15th-century Field Book that names this approximate area 'Gallow' (John Percival, NAU Archaeology, pers. comm.); the name may denote an alternative use for the site, but it has also been interpreted as a barrow name (Cornford 1984, 22-4).

The cropmarks of a causewayed ring ditch, Gorleston-on-Sea (NHER 45050), were partially excavated in 1998 (Hutcheson, 1998) and interpreted as a barrow of either Bronze Age or Saxon date, with a central cut interpreted as the remains of a grave-robbing episode, followed by an antiquarian excavation (*ibid.*). The barrow was interpreted as possibly being Saxon in date due to the predominance of medieval finds in the slumped ditch deposits. However, the aerial photographs clearly revealed a central cross, indicating the former presence of a mill. It is therefore probable that the entire structure was medieval in date, although it is possible that an existing round barrow was used as a mill stance; the excavation revealed no conclusive evidence of any funerary activity or the re-use of the site.

A small number of features associated with watermills and drainage mills or pumps were also recorded in the Coastal Zone, but by and large such sites are adequately recorded by readily accessible historic maps and the aerial photographic evidence makes little contribution to our understanding of them. Consequently, few have been mapped by the NMP, and those that have form too small a sample to warrant further analysis here.

Forty-eight possible stack stands – small platforms and enclosures presumed to have been used for storing winter fodder – were also mapped by the project. 75% were recorded as being of medieval to post medieval date. The most significant group is represented by a cluster of such sites identified near King's Lynn in the west of the county. This comprises numerous small cropmark and earthwork circles or ring ditches, ranging from 6m to 18m in diameter. A raised circular bank with narrow external ditch, a circular platform or a single ring ditch generally defines the sites. They appear both as isolated features and in relatively large groups of up to thirty individual circles (e.g. NHER 38235). The most likely function of these features is as stack stands for either hay or corn, with the external ditch providing temporary

drainage. Similar clusters of ring ditches have long been recognised from aerial photographs of the surrounding silt fen, and a Roman date has been postulated (Riley 1946, 150-3; Silvester 1988a, 197). As a result of analysing the relationships between these circles and medieval strip fields, however, Wilson (1978, 45) has suggested a possible medieval date for them. The King's Lynn examples all appear to be situated on reclaimed land, often surviving as earthworks overlying slight traces of ridge and furrow or drainage channels. In these cases a late, probably post-medieval date is indicated. The fact that some survive as earthworks reveals a shift in land use towards permanent pasture, which has acted to preserve a normally temporary agricultural structure within the landscape.

### **10.7 Post Medieval Sea Defences and Land Reclamation**

The embankment and drainage of the coastal marshes from the medieval period onwards has altered the appearance of much of the west and north Norfolk coast. One of the earliest large-scale sea defences within Norfolk would appear to be the bank, formerly known as Roman Bank, which runs between Clenchwarton and West Lynn (Fig. 10.8). This is thought to be largely Late Saxon and medieval in date, although Roman and Middle Saxon finds have been recovered from the earthwork (NHER 2187). As will be discussed further below (Section 10.12.1), saltern mounds, perhaps of Late Saxon to early medieval date, also formed one of the earliest components of coastal land reclamation in The Wash. The earliest sea defence banks appear to be relatively piecemeal constructions running from one saltern mound to another. It is possible that some of these started out as roads or causeways leading to and from salt production areas. The incorporation of salterns into early sea banks initiated a process that resulted in several kilometres of land being reclaimed and has changed the appearance of The Wash to the outline we recognise today.

A Parliamentary Act passed in the 1570s ensured that Norfolk's sea banks would be repaired and maintained. The Act empowered local justices to put work in hand to repair the banks and highways damaged by flooding (Ringwood n.d.). This indicates that in some areas sea defences had already been constructed by this date. The records of the Sea Breach Commission testify to the large amount of bank construction and repair work undertaken throughout the 17th century. Many of the records relating to the embankment and drainage of the marshes within The Wash date to the 17th century (*ibid.*), although many of the banks may have been well established by this period. Records of this date also refer to division and embankment of the marshes at Salthouse and the Burnhams in north Norfolk (*ibid.*). (The reclamation of the Burnham marshes is discussed in greater detail in the Case Study XVII below.)

The embankment and drainage of other sections of the north Norfolk marshes continued into the 18th century, in particular on land in the Holkham Estate, owned by the Coke Family, and in the manor of Wells and Warham, owned by Sir Charles Turner. In the earlier part of the

18th century these two major landowners simultaneously enclosed large areas of marsh on either side of Wells harbour channel and within a few years the harbour started to silt up (Barney 2000, 7-11). The process carried on throughout the 18th century (Ringwood n.d.) and to the continued detriment of the harbour. The situation led to a lengthy period of court action and trials in the late 18th century (Barney 2000).

### **Case Study XVII: Burnham Norton and Burnham Overy**

The Burnham harbour channel off the north Norfolk coast currently meets the land at Burnham Overy Staithe. In medieval times, however, the River Burn was navigable right up Burnham Overy Town, a little over 1km to the south. During the 16th and 17th centuries the silting of the Burn and the extension of the saltmarsh caused the harbour to be moved to Burnham Overy Staithe (Moore 1967, 15-6). The marshes to the north of the village and around the channel were embanked and enclosed during the medieval and post medieval period. The banks were constructed around areas of saltmarsh to enclose and protect these areas of land from heavy tidal incursions. The NMP mapping has recorded several phases of reclamation (Fig. 10.8).

The earliest record of embankment in the area is the raising of a bank in Burnham Norton by the canons of Walsingham Priory in the 13th century (Francis 2003, 20). This may have been a sea defence or perhaps an early attempt to reclaim an area of coastal marsh. A Carmelite hermitage was established on the edge of the Burnham marshes in 1241 (Francis 2003, 9-10), but this was moved in 1253 and St Mary's Friary established at its present location in the Burn Valley to the southeast (NHER 1738). It is therefore feasible that some early drainage and embankment of the marshes, associated with the Carmelite house, could have taken place during this period. The Friary held lands in Burnham Norton (Francis 2003, 14) and it is possible that some of this was coastal land. In the Norfolk Broads and the marshes in Orford, Suffolk, the earliest attempts at reclamation and drainage were associated with monastic houses (Williamson 2006, 196-7).

Although some banks on the Burnham marshes may date to this medieval phase, many are likely to have been constructed in the 17th century by major landowners, trying to improve their pasture and protect their land. In 1616 Sir Richard Cornwallis, Lord of the Brancasters, embanked some of the Brancaster marshes (de Soissons 1993, 14), which lie adjacent to those at Burnham. Certainly an agreement was made concerning an embankment in the Burnhams in 1670 (Ringwood n.d.) and other banks are likely to date to this period. By 1641 local fishermen were petitioning the courts over the adverse affects of the enclosure of the marshes on common grazing land and the silting up of the harbour and havens (Francis 2003, 20).

The NMP mapping has revealed two sets of quite dilapidated embankments on the Burnham marshes, both of which are cut by a bank (NHER 26670) designed by Thomas Telford and constructed in 1822. This relates to the 1821 Act for 'embanking, draining, inclosing, and improving certain Salt Marshes and Waste Lands' in Burnham Deepdale, Norton and Overy (Ringwood n.d.). One set of pre-1822 banks runs alongside a former tidal creek known as Norton Broad. A complex series of embankments are visible at the inland end of this creek and these originally formed Norton's Staithe, to the north of Marsh Farm (NHER 26676). The eastern part of the embankment is marked as 'Pile Bank' and the western part as 'Old Bank' on Faden's map of 1797. A second set of pre-1822 banks lies to the west. To the east, on Overy marshes, a series of severely dilapidated bank sections is visible. Two of the more substantial banks are referred to as 'Old Bank' on a map of Burnham Salt Marshes dated 1822. The close positioning and the fragmentary nature of these embankments (Fig. 10.8) suggests repeated piecemeal attempts at enclosure over a period of time, with new sections of bank replacing those in need of repair, enclosing a slightly larger piece of marsh each time.

### **10.8 Water Meadows**

The project recorded forty-four examples of possible floated water meadows of post medieval date within the Coastal Zone. Several sites, however, occupy low-lying positions on marshland, where the topography would seem to be unsuitable for such schemes. These might instead represent drainage features.

In northeast Norfolk, the earthwork remains of floated water meadows were recorded at Lessingham (HER 38555, 38556 & 38560) and along a tributary of the River Ant at Dilham and East Ruston (HER 38442-4, 38446, 38449, 38451 & 39353). Parallel drains used to control the flow of water around the meadows were present in all cases, with earthwork banks visible in between these at some sites. The majority were only visible as earthworks on RAF vertical aerial photographs dating from 1943 and 1946, most being ploughed during the following three decades. Only the site at Dilham (HER 39353) still survives as extant earthworks, and unsurprisingly it was the only site to have been recorded prior to the NMP reaching this area. Additional water meadows were mapped at Roughton (HER 38468 & 38498), and sites are also known from west Norfolk, including examples between Dersingham and Heacham (e.g. HER 1534, 33387, 26837 & 2662). Floated water meadows are generally believed to have been relatively scarce in Norfolk, with those that were constructed mainly concentrated in the west of the county (Wade-Martins & Williamson 1994, 25). The fate of most of the water meadows mapped in northeast Norfolk to date, however, would suggest that their apparent rarity results from their destruction by arable agriculture rather than a genuine absence. At the same time, and in the absence of supporting evidence, whether all of these sites really were floated water meadows or whether they include a number of other site-types which are similar in appearance, such as areas of intensive drainage or former turbaries, must remain open to question.

## **10.9 Post Medieval Parks and Gardens**

NMP mapping in the Coastal Zone has recorded twenty-seven areas of garden features of post medieval date. These are all located within the grounds of country houses and halls, and within larger landscape parks. The west and north coast revealed a greater number of sites associated with landscape parks and the wealthier country houses; this corresponds with a general concentration of these sorts of estate on the less productive, lighter and more acidic soils of north and west Norfolk (Edwards & Williamson 2000, 2). The types of features mapped can be divided into two broad categories: those associated with the formal gardens of country houses, and those within large landscape parks surrounding halls.

### **10.9.1 Formal Gardens**

The large country houses and halls built by major landowners from the 15th to the 19th centuries were generally located at the centre of substantial estates, often with formal gardens immediately surrounding the house while the majority of the land was leased out to tenant farmers (Edwards & Williamson 2000, 1). Traces of garden features were identified at several sites, although only at two were the plans of the gardens clearly revealed by aerial photography.

The site of Warham Old Hall and its gardens (NHER 1843) is clearly visible on aerial photographs as a series of soilmarks (Fig. 10.9). The hall was the seat of John Turner and was demolished at the start of the 18th century when Thomas William Coke of Holkham bought the Warham estate. The outline of beds and paths belonging to a formal garden, known as 'The Lawns', is clearly visible. The rectangular garden is divided into quarters by the paths, which form a cross-shaped arrangement of paths with a pond positioned in the centre. To the north, the location of the hall itself is also visible as soilmarks. Although the spreading of material and demolition rubble has obscured many of the architectural features, some aspects of the hall's plan can be made out. A central path can be seen, leading from the gardens to the front of the house, which appears to be arranged around a courtyard.

A similar arrangement of gardens at Browston Hall is visible on the aerial photographs (NHER 11434) (Fig. 10.10). Tom Williamson (University of East Anglia) has suggested that these date to the 17th century. The cropmarks suggest a central arrangement of square parterres and beds, with either compacted or surfaced walkways or walled areas in between. The latter show as slight ridges within a sunken, darker area. To either side of these formal beds are a series of ditches and enclosures, probably revealing the routes of paths and compartmentalised and subdivided areas of the garden.



### **10.9.2 Landscape Parks**

As mentioned above, the majority of large post medieval landscape parks located within the Coastal Zone lie in north and west Norfolk. The most significant of these are Hunstanton Park, Holkham Park and Sheringham Park. It is quite common for earthworks relating to pre-park features to be preserved in large landscape parks, in particular those that became deer parks early on in their life, where in general less hard landscaping may have been undertaken. Holkham Park represents a typical example of an emparked landscape, where an established landscape of houses, fields and roads was removed to enable the creation of the park. A map of 1590 clearly records this earlier landscape (Williamson 1998, 61-2). NMP mapping within the grounds of Holkham Park (NHER 1802) identified many traces of the former fields, boundaries and roads (see Section 10.5 above, for example). A series of parchmarks on the south lawns of Holkham Hall (NHER 1801) may also reveal traces of former buildings and structures; these are likely to relate to the site of the old hall and gardens that stood on the same site as the present hall. The NMP mapping of Sheringham Park (NHER 22881) revealed few new features within this field of interest, largely as a result of the dominance of woodland belts within the park's design.

#### **Case Study XVIII: Hunstanton Park (NHER 30464)**

The walled gardens of Hunstanton Park (NHER 1117) developed from the 16th century onwards, set around a moated house with possible 14th-century origins, within a park that originated as a deer park in the 15th century (NHER 30464). The design of the walled gardens and the park were altered significantly throughout the 17th century and the park was greatly extended in the 19th century. It is now designated Historic Parkland Grade II. The NMP mapping has provided substantial evidence of landscape features (Fig. 10.11), which complements the map-based and documentary research conducted for the estate (Williamson 1988, 252-3). More importantly, the NMP mapping has recorded new evidence of a possible medieval landscape preserved within the post medieval park. In contrast to Holkham, knowledge of the pre-park landscape at Hunstanton is currently unpublished, although documentary records are likely to exist. The Le Strange estate has a substantial archive, with records dating from the 13th to 20th centuries, and therefore it is possible that potential medieval features, currently known only from aerial photographs, are depicted on pre-park maps or referred to by estate records.

To the south of the hall and gardens (NHER 1117) but still within the park (NHER 30464) numerous earthworks were identified on the aerial photographs that possibly relate to medieval activity or settlement prior to the establishment of the park. In addition, post medieval landscape features that formed part of the changing design and use of the park were identified. The park is located on Boulder Clay, which has necessitated the implementation of quite a complex drainage system. It is likely that some of the ditches

mapped are part of the post medieval drainage scheme. The hall and moats are situated on the lowest ground, fed by the drains nearest to them.

An area of earthworks is visible surrounding a banqueting or music house, the Octagon. It has been suggested that these represent the remains of a formal garden (NHER 1117), but none of the estate maps reproduced by Williamson (1998, 124) depicts any such gardens at this location; in fact, on a map of 1765, this area seems to be wooded. No mention of gardens is made in Williamson's discussion of a map of 1615, which shows the park layout. The earthworks are extremely slight and only visible on a set of oblique photographs from 2000, which were taken in low winter light. They were visited recently as part of the Norfolk Monuments Management Project (NMMP), when it was noted that the features were difficult to see on the ground. The main component is a curving hollow-way, flanked by banks on either side. Low banks and platforms are visible to the west. The earthworks are quite fragmentary and their appearance suggests that they have been levelled or altered. None is obviously associated with the landscape park or with formal gardens. It is possible that they are pre-park features, perhaps relating to an area of medieval settlement or activity cleared to create the deer park in the late 15th century. Although it is also possible that they represent medieval garden features associated with the earliest phase of the hall, which has been suggested to have a 14th century core (NHER 1117).

To the south, the curving hollow that roughly defines the eastern limit of these earthworks links up with a more substantial, long-distance hollow-way, which runs the entire length of the park and eventually lines up with the parish boundary. A broad, flat-topped bank, which acts as a field boundary, accompanies this section of the hollow-way. This bank and ditch follow the parish boundary as far as an area of woodland to the south. Where the woodland ends, a funnelled trackway measuring approximately 15m across can be seen, fossilised in field and woodland boundaries. This again follows the parish boundary. It is possible that before the creation of the park these two features were connected. The hollow-way appears to act as a boundary to various smaller linear earthworks within the park and to some areas of possible ridge and furrow. It therefore seems likely that it pre-dates the park and represents an earlier feature that has been incorporated into the park's design. It is possible that the hollow-way has very early origins. One of the suggested routes for the Icknield Way (a long-distance trackway with possible prehistoric origins, NHER 1398) is that it approached Hunstanton from the south, joining with the line of the parish boundary. At present, the line of the road north through Hunstanton is not known. It is therefore possible that the hollow-way mapped by the NMP marks the line of a prehistoric track, which could have continued in use until the creation of the park in the late medieval period.

A medieval enclosure (NHER 1284) is located within the park, and is cut by a road or additional hollow-way. The enclosure has been interpreted as a stock enclosure or pound. It

is possible that the later road was one of three removed in the 16th century when the park was expanded, although reference to the estate maps would suggest that in 1765 a fence or park pale ran along its course. On an estate map of 1820 an actual road is marked running along a similar route. It is therefore possible that this was originally a fenced boundary, which later developed into a road as the park expanded.

The remainder of the mapped earthworks are more obviously part of the post medieval landscape park, and include a former approach road to the hall. Reference to the estate maps reproduced by Williamson (1998, 124) suggests that in 1765 this route was the main road into and around the east of the park, and it remained as such until the park was expanded between 1835 and 1844. A number of large embanked enclosures are also visible within the park; these are likely to represent woodland boundaries. One matches an enclosure depicted on a map of 1765, which was removed by 1820. The southeastern part of the park contains a series of low banks. Many of these are parallel, some are also segmented, and several of the banks may originally have formed rectilinear enclosed areas. This system of closely set and segmented banks and enclosures is likely to represent hedge and fence lines, possibly dating to the early 17th century when the park had a compartmentalised design (Williamson 1998, 43).

#### **10.10 Duck Decoys**

Duck decoys are a relatively common, later post medieval feature of wetland landscapes. The decoys typically comprised a pond with multiple arms or 'pipes', into which duck and other water-birds were lured before being caught in nets. They were introduced from Holland in the early 17th century, and Norfolk is home to three of the oldest examples in the country (Baker 1985, 1-2). Eleven possible examples were recorded by the NMP in the Coastal Zone, five of which are documented in late 19th-century surveys of such sites (Southwell 1879; Payne-Gallway 1886). They include Waxham Decoy, established in the reign of James I, for which Lambridge Covert, Sea Palling (NHER 13293) had previously been suggested as the probable site. The NMP has identified a more likely site for the decoy on Brograve Levels, 1.5km to the southeast (NHER 42091). The remaining, undocumented examples comprise a variety of possible decoy sites, the date and interpretation of which is uncertain.

There is a general clustering of documented decoy sites in the east and west of the county (Thorogood 2000). The examples recorded by the NMP lie in west Norfolk (Dersingham, NHER 28166), north Norfolk (Holkham, NHER 36031), and northeast Norfolk ('Waxham', Sea Palling, NHER 42091; Winterton/Somerton, NHER 30618; and Hemsby, NHER 27213). At Hemsby nothing was identified on the consulted aerial photographs that could be associated with the decoy, but its location is indicated by the placenames Decoy Carr and Decoy Farm, and by a 19th-century description of the by then disused site (Southwell 1879, 545). At Waxham Decoy, which may have originated as a medieval peat cutting, a crescent-shaped

soilmark with several possible pipes is visible on the aerial photographs. Although several sites had been put forward, the definite location of the decoy was not known prior to the NMP mapping. Both Waxham and Hemsby are believed to be early decoys, probably simple constructions developed from existing areas of open water (Baker 1985, 2-4). This may account for their relatively poor visibility on aerial photographs. At the other documented sites a more obvious pond with pipes is visible.

#### **Case Study XIX: Winterton Decoy (NHER 30618) (Fig. 10.12)**

Known as Winterton Decoy, but in fact straddling the Winterton/Somerton parish boundary, this site is the most complete example of a duck decoy mapped by the Norfolk NMP in the Coastal Zone. It is almost certainly the two or two and a half acre decoy, notable for its small size, which was built by George Skelton in 1807 (Southwell 1879, 545; Payne-Gallway 1886, 137-8; Baker 1985, 5). (The Skeltons were a famous family of decoymen.) It was originally constructed for Mr Huntingdon, from whom it passed to Mr Joseph Hume. References to a decoy measuring approximately 30 acres, mentioned in a number of sources (e.g. Brown 2000, 73), which was also owned by Mr Hume and located at Winterton, may relate to this site, an error being made with regards to its size, or may relate to a separate site. Despite its small size Winterton decoy appears to have been a successful enterprise: in his second year working the site George Skelton took 1100 teal in seven consecutive days (Southwell 1879, 545). The decoy was abandoned in 1875 (Thorogood 2000).

The decoy, as visible on the consulted aerial photographs, was an approximately two acre (78.2ha) site, comprising a central pond with six curvilinear arms equally spaced around it, contained within an embanked circular enclosure. This matches the depiction of the decoy on historic maps, including the Ordnance Survey 1st edition 1 inch map and Winterton Tithe Map. It seems from the Tithe Map that parts of pre-existing field boundaries or drains were incorporated into the decoy enclosure; these are also visible on the aerial photographs but were not mapped by the NMP. Vegetation marks on the aerial photographs visible in the area surrounding the decoy suggest that it was sited on an area of lower and/or wetter ground; this possibly corresponds with the site of a large pond (the central one of three) depicted on both Faden's and Bryant's maps of Norfolk (dated 1797 and 1826 respectively). Although parts of the decoy may have been damaged or destroyed when the central pond was remodelled after World War Two, much of the site may still survive as an extant earthwork. The area is still named Decoy Wood on modern maps.

#### **10.11 Medieval and Post Medieval Military Defences**

In contrast to 20th-century military defences, evidence of those dating to the medieval to post medieval period is quite limited. This is partly due to the sites of earlier fortifications (such as those known to have existed at Great Yarmouth) being developed and rebuilt over time, or remaining as structural elements that are not best dealt with using aerial photographic evidence. The cropmarks of the ditch of the former motte and bailey castle within the Burgh

Castle Shore Fort (Fig. 8.3) represent an exception to this trend. The only definite evidence of medieval and post medieval coastal fortifications identified by the NMP was associated with the Armada defences constructed on the north coast between Blakeney and Weybourne: Weybourne Hope and Black Joy Fort. Two further possible fortified sites were recorded at South Wootton, but their identification is not as certain. No obvious signs of the numerous 18th-century and Napoleonic fortifications that are known to have existed along the Norfolk coast (Kent 2005, 133-4) were identified from the aerial photographs.

#### **10.11.1 Weybourne Hope**

The coast at Weybourne has long been considered a potential invasion point, due to the presence of deep inshore waters. The old rhyme 'He who would old England win must at Weybourne Hoop begin' (Cozens-Hardy 1937, 311) illustrates its notoriety. This perceived vulnerability has led to Weybourne being the subject of several major defensive schemes throughout its history. A document, probably of 1588, refers to enlarging the sconce at Weybourne Hope, showing that a fort or defences already existed here (*ibid.*). A 1588 map, held by Hatfield House, shows a large fort at Weybourne Hope (Hooton, 1996, 111) and defences running along the edge of the marshes to 'Black Joy Forte' (NHER 33214), somewhere in the region of Cley Eye or Blakeney Eye. The defences at Weybourne Hope are depicted as being quite elaborate, although it is possible that the map shows what was intended to be constructed, not what was actually built.

Any former Armada fortifications at Weybourne may have been obliterated by later defences, such as those associated with the large anti-aircraft training camp established there during World War Two (NHER 11335; Case Study XXX). A map of 1704 showing the manor of Weybourne (Brooks 1984) records the coastal strip as 'Sconce and No man's Furl'; this could indicate that elements of the Armada defences remained at that date. The notation is positioned to the immediate north of the present coastline and therefore the majority of these defences would have since been eroded away. However reference to the 'planned' design of the sconces on the 1588 map indicates they potentially turned inland significantly to the west and therefore it is possible that some of the more inland elements could have survived erosion by the sea until relatively recently. Along the edge of the World War Two camp was a series of dilapidated angular linear earthworks, visible only between 1941 and 1946; these may have been the remains of the early defences and sconces (NHER 38634) but this area of the coast has since eroded.

#### **10.11.2 Black Joy Fort (Fig. 10.13)**

The possible remains of Black Joy Fort (NHER 33214), referred to above, which also formed part of the Armada defences on the Norfolk coast, were identified by the NMP. In the 1588 document mentioned above, the fort is described as guarding the entry to Cley Haven (Cozens-Hardy 1937, 311). The remains of a fortification on Cley Eye are depicted on maps dating to the 18th and 19th centuries and were recorded on the ground in 1951. It was

thought that any surviving earthworks had been completely destroyed by the 1953 floods; however, the NMP mapping suggests that some traces of these defences still survive. These earthworks have since been identified on the ground during the Norfolk Rapid Coastal Survey. They consist of an angular embankment enclosing an area measuring 265m by at least 65m. The bank measures up to 5m wide and is more substantial on the northern, seaward side of the site. This may be a product of variations in the survival of the earthworks, or may instead reflect the original design. A possible redoubt is suggested by the angular shape of the bank towards the southern part of the site.

### **10.11.3 Possible Defences at South Wootton**

Two saltern mounds to the north of King's Lynn (NHER 13784 & 31431) appear to have been surrounded by substantial ditches (Fig. 10.14). The mounds would have overlooked the approach to the town and the western edge of the Great Ouse, prior to its 19th-century canalisation. The mounds may have been fortified to act as defences against the potential threat of the Armada in 1588, or as part of the Parliamentary blockade of the town in 1643, but this is not certain. The area to the immediate east of the mounds has been recorded as a Civil War fort (NHER 13784), and two cannons were allegedly recovered from this site, although there are no further details or dating evidence for these pieces of ordnance. It has been suggested that this marks the location of a sconce or fort referred to in the document of 1588 referred to above. This lay at the 'croche' (the Crutch, north of King's Lynn, where the navigable channel bifurcates) 'a myle distant from Lynn where ye chanell is narrowest' (Cozens-Hardy 1937, 312).

To the west is another group of salterns (NHER 31431), one of which is surrounded by a sub-rounded to sub-angular ditch with five potential sides. There also appears to be a stretch of secondary outer ditch running around the northern end of this mound. On the northern side of the mound are three chevron-shaped ditch or pit like features, 18m to 23m in length, visible as low earthworks in 1946. There are two parallel ditches running between the central mound and the southern mound, flanking a raised area that may be a potential causeway joining the two mounds.

Five ditches radiate out from the mound and are probably simply drains or canalised saltmarsh channels, although it does appear that the central mound within the group has been deliberately enclosed, possibly to act as a defensive strongpoint. It has been suggested that the site may represent a 17th-century Civil War fort, although it may instead be part of the Armada defences of King's Lynn referred to above. The raised nature of the saltern may have lent itself to being a defensive or observatory vantage point overlooking the Great Ouse, and it may have been used during more than one conflict. It is interesting to note that the parish boundary skirts neatly around the northern side of this mound, enclosing the large mound within King's Lynn parish. This may be a deliberate act of enclosing a strategically significant

fortification within the parish, but equally it may simply follow the meander of a relict saltmarsh channel.

## **10.12 Industrial Sites**

### **10.12.1 The Salt Industry**

#### *The Wash Evidence*

One of the most productive areas for the Norfolk NMP in terms of coastal archaeology has been The Wash, where nearly 300 medieval saltern mounds have been mapped. Prior to the project starting there were few records of such sites on the NHER, although many of the surviving earthwork examples had been mapped and recorded by Tony Vine. Despite this work, various sites had been visited and had been interpreted as being natural, as the mounds only contained sand. This may be due to the expectation of finding evidence of burning and briquetage, as is the case with earlier 'red hills' (see Section 7.3). However, by the medieval period a different process, known as 'sand washing', was being used, where brine-impregnated sand and silt was washed through a filter of peat or turf and the solution then boiled. The salt was then separated from the sandy waste material, the latter being heaped into mounds up to 200m across and over 5m high. Once ploughed these 'saltern mounds' are visible as pale floriform soilmarks (Grady 1998, 81-4). A circular embanked feature measuring 6.5m in diameter, which was excavated on top of a mound at North Somercotes in Lincolnshire, was interpreted as the remains of a boiling hearth (Grady 1998, 84). A number of circular banks and ring ditches have been recorded on top of the saltern mounds in Norfolk's Coastal Zone; these have been mainly interpreted as stack stands (Section 10.6) although it is possible that some represent the remains of boiling hearths.

At North Lynn and South Wootton two large swathes of salterns are visible (Fig. 10.15), and these clearly reflect the former medieval coastline of King's Lynn and estuary of the Great Ouse, prior to reclamation and the re-cutting of the channel in 1821. The salterns located furthest inland represent the earliest salt production and would have been gradually abandoned in favour of sites further out in the channel due to coastal change and silting of the estuary. This pattern is consistent with the salterns on the Lincolnshire coast (Grady 1998, 86). The sand washing process is thought to date from at least the 11th century (Grady 1998, 91-2; Keen 1988, 134-6) and salterns in West Lynn have produced 11th- to 13th-century pottery (Silvester 1988b, 26-7). However, Domesday records for the King's Lynn area indicate that the salt industry was already well established here by 1086 (Keen 1988, 170-2). An early date is also indicated by the NMP mapping, which shows the line of a sea bank thought to originally date to the Late Saxon period (NHER 2187) cutting through or incorporating a group of salterns (NHER 27946) (Fig. 10.15). However, as some sections of this bank have been shown by excavation to be medieval, nothing definite can be proved by this relationship at

present. The course of the sea bank also cuts off a group of salterns at Terrington St Clement from the sea, again indicating its later date (Silvester 1988b, 40).

Lines of abandoned salterns commonly appear to have been incorporated into early sea defences and banks (Fig. 10.15 inset). The areas of raised ground created by the salterns would have been prime sites for settlement and agriculture. The salt industry should be seen as a major factor in early land reclamation in The Wash. The NMP identified possible structures and platforms on top of some mounds, although it is not clear whether any of these represent saltcotes, i.e. contemporary structures used for salt-making. Several mounds do appear to have evidence of medieval settlement and ridge and furrow on top of them (e.g. NHER 22594). It has also been suggested that West Lynn Church, destroyed and rebuilt around 1271, had been placed on top of a saltern (Silvester 1988b, 27). Early excavations of the possible site of St Edmund's Chapel at North Lynn (NHER 5531), which was apparently destroyed by flooding in the 17th century, also appear to locate the site on top of a saltern complex (NHER 27889). The exact nature of the building is debatable, as later excavations suggested domestic occupation.

#### *The Breydon Water Evidence*

The medieval herring-curing and fishing industry at Great Yarmouth would have required vast quantities of salt. It is likely that a significant proportion was produced locally or perhaps shipped round the Norfolk coast from The Wash. Evidence for medieval salterns was recorded from the former Halvergate estuary. A total of thirty-nine sites were identified, located either at the edge of the former estuary (Fig. 10.16), now grazing marshes alongside the Rivers Yare and Waveney, or next to Breydon Water. As with The Wash, the salt industry is likely to have originated during the Saxon period. Several sites have Late Saxon pottery associated with them (NHER 17773, 21645, 22349, 35369 & 42199).

As discussed in Section 2.4.2, Breydon Water is all that remains of the former estuary which originally existed to the north of Great Yarmouth. Although already significantly silted by the medieval period, Domesday indicates that the estuary, in particular the northern shore, still received an influx of seawater at this time. Saltworks are recorded at Runham, Mautby and Caister, South Walsham and Halvergate. The parish of Caister had forty-five saltpans listed (Ringwood n.d.). This is a significant statistic when compared with the equivalent records for The Wash area, e.g. Wootton, where only twenty salthouses are listed but aerial photographs reveal masses of evidence for the salt industry. It is possible that this dichotomy reflects an acceleration of the industry in The Wash after the 11th century, whilst that in the area around Great Yarmouth declined. Either way, the large number of saltworks listed for the Caister area would suggest either that these were coastal and no longer survive, or that the industry differs from that of The Wash in terms of recognisable remains. It has been assumed that the same 'sand washing' technique used in The Wash was employed by the salt industry around Great



Yarmouth, although it is possible that the different topographic conditions – estuarine rather than coastal – meant that a different method was required. This may have created less obvious waste mounds, therefore making the identification of sites more problematic. The solar evaporation of brine in tanks, followed by boiling, was employed at Great Yarmouth in the post medieval period (see below) and it is possible that this technique was also used at earlier sites.

It has been noted that records referring to saltworks become less frequent after the late eleventh century and that this apparent demise of the salt industry at Great Yarmouth was a consequence of the closing off (by the Yarmouth sandspit) of the northern entrance to the estuary (Abbott et al. 1994, 87-8). However, the existence of a northern entrance to the estuary is itself a matter of debate. The theory can be traced back to Thomas Damet and Henry Manship, both writing around the late 16th century, but the reliability of these sources is uncertain and no solid evidence of the channel has been found by modern research (Ken Hamilton (NLA) pers. comm.). Many of the Domesday salt pans would have lain close to the coast and the edge of the estuary, but a number were probably located on tidal creeks crossing the inland marshes of the former estuary (Williamson 1997, 45). Records of a holding at South Walsham which belonged to St Benet's Abbey still refers to salt pans in 1140 (ibid., 46). These are likely to have been located alongside the Fleet Drain, which probably originated as a tidal creek.

A number of mounds located within the marshes round Halvergate have traditionally been interpreted as salterns (e.g. NHER 4322-3), although excavations at some of these sites, in particular Ashtree Farm, Halvergate (NHER 4322), suggested that they are more likely to have been the sites of marsh farms or refuges for livestock (Williamson 1997, 46-7). It is possible that in many cases an existing saltern mound was utilised for a farm or shelter, as the conditions for salt production declined and the importance of sheep grazing increased. Other farmhouses in the marshland, including Six Mile House (NHER 21103) and Lockgate Farm (NHER 35368/42174), appear to have been built on possible medieval saltern mounds. As described above, the re-use of salterns in The Wash was quite common.

The mounds identified within the Great Yarmouth area are significantly smaller and less prolific than in The Wash. This may suggest a much smaller scale industry, and could indicate that this was a less productive area in terms of salt-making. The continual silting of the estuary and tidal creeks, combined with the increasing value of the marshes for sheep rearing (Williamson 1997, 46), could have meant that salt production was not as lucrative or practical as it was in The Wash. As stated above, there was an immense demand for salt for use within Great Yarmouth's fish-curing industry, but much of the salt produced locally was not suitable for this purpose (Gruenfelder 1991, 162).

The saltern mounds visible near Great Yarmouth tend to be less amorphous and smaller than The Wash examples. It could be argued that the less amorphous mounds are those most likely to represent the remains of marsh farms. Some irregularly shaped mounds were recorded, such as those located on the edge of the former estuary to the south of Burgh Castle (now within Belton Marshes; NHER 49235-6) and on Halvergate Marshes (NHER 42445). Although the plan of these is more reminiscent of The Wash examples, they are still significantly smaller. A small number of large mounds also exist in the Great Yarmouth area – for example NHER 22349 and 42196 in South Walsham, which both measure over 100m across – but these are not as common as in The Wash area. It may be significant that the largest mounds are located in South Walsham: these may be the saltworks located within the demesne lands of St Benet's Abbey, mentioned above.

Despite this apparent decline of the medieval salt industry there is evidence that salt production took place in the Great Yarmouth area in the post medieval period. Salt pans and works were constructed in and around the town during the late 16th and early 17th centuries; one such site, leased by Samuel Doubleday, is described as being 'beyond the haven's mouth' (Gruenfelder 1991, 163). A major salt production site was constructed in 1635 by Nicholas Murford on Cobholm Island (Gruenfelder 1991, 164). The saltworks is described as covering twenty-four acres, with channels, cisterns, ponds and 'many other works for receiving, finding, purifying, separating and evaporating sea water whereof we make salt without fuel and do also thereby make and preserve brine to make salt with fuel' (ibid., 166). The salt production method employed by Murford involved collecting brine from May to August, evaporating it in pits and then boiling it to produce white salt. This would appear to be the same method as that employed at the 'sunworks' site at Lymington and others like it on the Lincolnshire coast (Rudkin 1975, 39; Grady 1998, 81).

The only evidence for this major salt production site is a series of rectangular tanks or pits depicted on two maps of Cobholm Island. On the 1688 De Gomme map a rectangular enclosure is marked 'Salt Pound'. On the 1724 Prospect of Yarmouth by Corbridge a total of eight rectangular tanks or pits are visible on the marsh. Unfortunately no definite evidence of the site is visible on aerial photographs of the former island, much of the land having been built on before the 1940s (when the earliest consulted photographs were taken). A series of rectilinear drainage channels, visible on the undeveloped margins of the island, can be seen to have been more extensive on the Ordnance Survey 1st edition 6 inch map. These divided the northeastern part of the island into rectangular and square areas, and it is possible that they represent the remnants of the complex system of channels that must have operated at the saltworks.

### **10.12.2 Brickworks**

Evidence of post medieval brickworks was only recorded if it provided additional information that could not be gleaned from readily accessible historic maps. The majority of the post medieval brickworks encountered by the NMP in the Coastal Zone are adequately represented on Ordnance Survey 1st edition 6 inch and 2nd edition 25 inch maps. Often sites went out of use in the period between the production of these Ordnance Survey maps and the earliest available aerial photographs. Consequently, the impact of the NMP mapping on the record of the brick industry of Norfolk is limited. A total of seven sites were recorded, only one of which, Felbrigg (NHER 39178), is a new addition to the NHER. All but one of the sites are post medieval in date. NHER 8688 at West Caister is the only site that is potentially medieval in date, and it is also the only site where the NMP mapping has added any significant information.

#### **Case Study XX: West Caister Brickworks (NHER 8688)**

This late medieval to post medieval brickworks was located on the northern banks of the River Bure. The brickworks is reputedly the source of the bricks used in the construction of Caister Castle (NHER 8671). A long, thin, very friable, pinkish red brick, of the sort utilised in the construction of the castle, was found at the site in 1979. The aerial photographs reveal a series of large extractive pits, platforms and banks. A large and irregular area appears to have been excavated to a shallow and relatively uniform depth. Apparently surrounding the area of clay extraction are low earthwork platforms. As the field is surrounded by drainage ditches, it is very difficult to accurately compare the ground-level with that of surrounding fields. Consequently, it is not possible to determine whether the platforms actually represent raised areas, or simply areas that have not been excavated. It is possible that they are partly made up of overburden material from the clay workings. Cut into the platforms to the east of the site are six sub-circular pits and one rectangular pit. The function of these pits is not clear but it is possible that they were related to brick-making at the site and could represent the remains of brick kilns. The site was under arable cultivation in 1988 and it is presumed that the earthworks have been levelled.

### **10.12.3 Rope-Making**

The town of Great Yarmouth on the east Norfolk coast once possessed several rope walks, a detail that is unsurprising given the importance of fishing to its economy. Here rope fibres were laid out in a long narrow shed or area of open ground, before they were twisted first into strands and then into rope. The outline of one of Great Yarmouth's rope walks is preserved in the form of a park, Grammar School Grounds; within which the NMP mapped a World War Two air raid shelter but there was no visible evidence of the area's former industrial use (NHER 33475). The possible site of a second rope walk was evident at Southtown, southwest of the town centre, where a rope walk is marked on the Ordnance Survey 1st edition 6 inch map. Here parallel ridges, reminiscent of ridge and furrow, are visible as earthworks on aerial

photographs taken in the 1940s and '50s, but these have since been levelled. They are almost certainly 19th century in date, as they cut across boundaries depicted on the South Town Tithe Map of 1843. Similar ridges are shown on a photograph of a ropewalk in Wrenthorpe (West Yorkshire) taken in around 1910 (Green 1992). Alternatively, they might be drainage features.

# 11 Twentieth Century

## 11.1 Introduction

In recent years the value of 20th-century military archaeology has increasingly been recognised, and the mapping and recording of such sites visible on aerial photographs (other than those post-dating 1945, see Section 11.4 below) is now a routine part of any NMP project. The use of historic photography, where available pre-dating the RAF National Air Survey of 1945–7, means that many features since destroyed in the post-war period can be mapped and recorded. The use of historic aerial photographs has had a particular impact on the recording of World War Two sites, as contemporary photographs exist for a proportion of the country. These reconnaissance photographs include the ‘M’ series photographs of 1940–1, for example, which were used to monitor the effectiveness of camouflage schemes masking defences along vulnerable coastlines and in urban centres (Lowry 1996, 9). Unlike the later National Survey photographs, those taken during the war often record the more temporary and insubstantial military sites, such as tented encampments or mobile installations (e.g. early anti-aircraft batteries, radar equipment or a late form of searchlight battery). For more substantial sites, they provide a snapshot of the surrounding landscape, placing them in the context of wider defensive schemes, the other elements of which were removed before or immediately after the end of the war. Where several photographs exist spanning a number of different years during the war, the whole lifetime of a military site can be recorded: its initial establishment, its growth and development, its disuse and abandonment, and, in many cases, its eventual destruction. Unlike many other sources, particularly historic documents, aerial photographs can also record the physical location of military sites with a high degree of accuracy. At Great Yarmouth, for example, there is a notable discrepancy between the location of light anti-aircraft batteries mapped by the NMP and those recorded from Military Grid References in documentary sources (see Case Study XXVI below). The location of many other sites recorded in the NHER or in secondary sources was corrected from the NMP mapping.

In both World Wars (and indeed in preceding centuries) Norfolk’s long, relatively gentle coastline was regarded as vulnerable to an invasion force. Its proximity to the continent also made it a target, particularly from aerial attack (several towns in Norfolk, including Sheringham and Hunstanton, claim to be the first in the country to have been attacked from the air). As a consequence the entire Norfolk coast was provided with a succession of defences to protect against attack, whether from the sea, on land or from the air. Previous investigations of these defences include those by Peter Kent, incorporating work for the Defence of Britain project, and by Christopher Bird (e.g. Bird 1999). The fragmentary remains of numerous sites were recorded during the Norfolk Rapid Coastal Survey (Robertson et al.

2005), while the location of a number of more substantial (and recognisable) sites were recorded on an ad hoc basis from 1946 aerial photographs, principally by Brian Cushion and Edwin Rose (NLA). The Coastal Zone NMP, however, represents the first attempt to record such sites in detail, and in a uniform manner, from contemporary or near contemporary sources.

Only a small number of pre-World War Two photographs were available for consultation, and these were generally of poor quality. Consequently, there is an overwhelming bias in the NMP data towards sites of World War Two date. Of the 4778 sites recorded by the project, approximately 1500 had evidence of some World War Two activity compared to only fifty-one sites of World War One date. These figures demonstrate not only the effectiveness of using contemporary aerial photographs to record World War Two sites, but also the extent to which earlier military remains may be missing from the archaeological record. Local biases in the evidence for World War Two sites, relating to photo coverage for example, are discussed in more detail in the introduction to Section 11.3 below.

## **11.2 World War One**

A total of fifty-one sites of World War One date were mapped in the Coastal Zone; thirty-one of these were newly recorded sites. The number of World War One sites recorded is quite low when compared with those from World War Two. This ratio is unsurprising, when the date of the aerial photographic sources is considered: the earliest available aerial photographs date to World War Two and the immediate post war period. The same prominent coastal sites were chosen for defensive sites from both periods, and the extensive dunes and heaths of the Coastal Zone were utilised as training grounds during both wars. Consequently, many of the World War One military sites were re-used or destroyed during World War Two, often before the earliest consulted aerial photographs were taken. This made it hard to identify defensive sites pre-dating World War Two. Many sites, such as the World War One airfield at Sedgeford (NHER 13162), were re-used and adapted during World War Two, and it is this later phase that dominates the aerial photographic record. This problem is exacerbated when considering small structures such as pillboxes, which were often re-used during World War Two, and are frequently hard to distinguish from their 1940s counterparts. A total of eighteen pillboxes definitely dating to World War One were recorded; none of these was a new site. Only two new possible World War One pillboxes were identified: a possible hexagonal pillbox at Great Yarmouth (NHER 27631) and a possible circular pillbox on the south bank of Breydon Water, also in Great Yarmouth parish (NHER 27584). The only significant structural remains dating from World War One recorded within the Coastal Zone were components of the aeroplane and seaplane station on the South Denes, Great Yarmouth (NHER 13631). There are only two other categories of World War One feature that were recorded in any significant numbers: practice trenches and firing ranges.

### **Case Study XXI: South Denes Seaplane Station (NHER 13631)**

The World War One aeroplane and seaplane station on the South Denes was established in 1913 and was used by the Royal Naval Air Service until 1918, when it was taken over for Royal Air Force use. The remains of the station are clearly visible on aerial photographs from the 1940s, by which time many of the structures had been removed, or incorporated into World War Two coastal defences. The plan of the site is clearly revealed by the foundations and hardstandings associated with former structures, which included several large seaplane sheds (Fig. 11.1). All of the sheds had a T-shaped central area that was left unsurfaced; it is probable that these related to former inspection pits or dry docks for undertaking maintenance of the seaplanes. A number of barrack huts remained amongst the World War Two defences; indeed one of these huts survived until relatively recently. The plan of the site recorded by the aerial photographs corresponds well with the map produced by a RAF survey of 1918 (RAF, 1918).

#### **11.2.1 Practice Trenches**

As mentioned above, the location of many World War One training areas coincided with those of World War Two, and this meant that often two phases of fieldworks were visible on the aerial photographs. World War One trenches can be identified from their characteristic crenellated plan and a dilapidated or infilled appearance on photographs taken early in World War Two. A total of fifteen sites were identified where sections of possible World War One trenches were visible. A number of these sites had previously been recorded as being World War Two in date (NHER 17818 & 35551), but consultation of the earliest available photography indicated that they pre-date this period. The most significant of the new sites in terms of the historic environment are the trenches identified on Winterton Dunes (NHER 42447), which still survive as earthworks, and a trench in Waveney Forest (NHER 43363), where survival is thought to be likely, but as yet not verified on the ground.

### **Case Study XXII: Kelling Heath (NHER 38414, 38418 & 35551)**

During World War One the village of Weybourne in north Norfolk became the base for a significant number of troops, all stationed in temporary camps that have left no obvious traces visible on aerial photographs. However, the photographs do reveal evidence of the training activities undertaken in the area during this period. On the coast, to the east of Weybourne anti-aircraft training camp, the cropmarks of a series of backfilled, angular and crenellated slit trenches are visible (NHER 17818). However, it is the vast heath at Kelling to the southwest that demonstrates the true extent of World War One activity in the area. The heath was also used extensively by World War Two troops for training and is scarred with hundreds of trenches, weapons pits and craters (see Case Study XXIX). However, amongst the more recent fieldworks is a series of more dilapidated trenches with the crenellated plan characteristic of World War One trenches (Fig. 11.15). (The main components of the trench systems are recorded under NHER 38414, 38418 and 35551.) These chains of trenches,

some up to 35m long, consist of a series of firing-lines and gun positions, connected by communications trenches to what may have been service and storage areas (Fig. 11.2). Much of this area of Kelling Heath has since been converted to arable and many of the earthworks destroyed. It is possible, however, that some trace of this extensive system of World War One trenches still exists.

### **11.2.2 Firing Ranges**

Firing ranges constitute another category of World War One site revealed by the aerial photographs. A total of five ranges were identified, although one of these is not definitely World War One in date. The range at Fritton (NHER 43362) may instead be a very early World War Two site, and was certainly in use during World War Two. Several of the possible World War One ranges were re-used during the later war, again making identification problematic. Only one of the sites – Runton (NHER 38315) – was previously recorded. The earthworks of one of the new sites, located on Winterton Dunes (NHER 42440), still partially survive and have been identified on the ground.

#### **Case Study XXIII: West Runton Firing Range (NHER 38315)**

At Woman Hithe, West Runton, two firing ranges are located on the clifftop within 120m of one another (NHER 38315). Both originally consisted of a series of up to four parallel linear earthwork banks or shooting butts, situated in front of a main target platform at their northern, seaward end (Fig. 11.3). Only the northern butt of the western range survives as an earthwork today. The comparable design and arrangement of the earthworks would suggest that the pair were constructed together. During World War One they would have been used by locally stationed troops undertaking training and coastal defence duties (Storey 1999, 37). However, while the western range was clearly also used for training during World War Two, the eastern component had become redundant by this date. The remains of a similar shooting butt were identified 5km to the west at Upper Sheringham (NHER 38617). This again pre-dates World War Two defences at the site and part of the butt still survives as an earthwork.

### **11.3 World War Two**

As described above (Section 11.1), sites of World War Two date form a very large component not only of the 20th-century military archaeology recorded in the Coastal Zone, but also of the NMP mapping as a whole. The World War Two sites encountered by the project comprise an extensive range of different forms and types, from small air raid shelters used by individual families to networks of anti-invasion defences extending for kilometres along the coastline, from highly technical sites such as radar stations to the vast areas of fieldworks dug at military training areas. It is undoubtedly the case that the NMP's greatest contribution to the NHER thus far, in terms of the discovery and recording of new sites, has been in terms of the World War Two archaeology described in detail below.



There are a number of factors that have led to notable biases in the dataset of World War Two sites produced by the NMP for the Coastal Zone. The most significant of these relate to photo coverage. For large parts of the Norfolk coast, particularly the west of the county and those parts of the Coastal Zone that lie some distance inland, the RAF National Air Survey of c. 1946 provides the earliest photographic coverage. By this date, all trace of many ephemeral and temporary military sites had been destroyed, or they were no longer in a condition that allows them to be recognised from the air. Even more substantial sites, such as anti-aircraft batteries, have often been demolished by this date or at least had important components such as the guns removed. This means that not only have fewer World War Two sites been recorded for these areas, the precise function of those sites that have been identified remains enigmatic. In addition, often they can only be recorded in isolation, divorced from the defensive landscapes that would have once surrounded them.

By contrast, numerous wartime aerial photographs, both vertical and oblique, were available for other parts of the Coastal Zone, in particular the northeast and east coast. Great Yarmouth, which was home to a small but strategically important Naval base, was an extreme case, for which over 1000 photographs taken during and immediately after the war were consulted. The greater availability of photographs, taken over a longer period, allowed many less substantial military sites to be recorded, of which barely a trace is visible in 1946. In Great Yarmouth, the existence of high-resolution, low-level vertical photographs taken in 1945, covering much of the town, allowed many very small sites (such as Anderson shelters, see Case Study XXXIII below), usually invisible on photographs taken at higher altitude, to be mapped. In the parish of Great Yarmouth, 514 World War Two sites were recorded; at King's Lynn in west Norfolk, where no wartime coverage was available, only four World War Two sites were identified. The extra detail also visible on the Great Yarmouth photographs allowed many sites, such as light anti-aircraft emplacements, to be identified as a specific type, whereas they might instead have been recorded more generically as gun emplacements.

A further factor affecting the results of the project in terms of World War Two archaeology relates to the way in which the NMP data is interrogated in the NHER. The thesaurus terms originally available for recording World War Two sites were limited. Only when the Defence of Britain thesaurus was made available within the NHER from summer 2004 onwards, was it possible, for example, to index sites as possessing a pillbox of a particular design, or specific forms of anti-tank defence. As a consequence, and given the large size of the dataset involved, those World War Two sites mapped in the west of the county (i.e. pre mid-2004) have been analysed in less detail than those in the east, simply because the records relating to particularly site-types are more difficult to retrieve from the database.

### **11.3.1 Anti-Invasion Defences**

Britain's vulnerability to an invasion was highlighted by the German landings in Norway in April 1940 and further reinforced by the rapid fall of France and the Low Countries in the following month. The defeat of British forces at Dunkirk at the end of May 1940 made the threat of an invasion very real indeed. This prompted a major programme of defence construction aided by the 300,000 troops who had returned from France (Foot 2006, 6-7). However, plans for anti-invasion defences were underway before this date. On 11th May 1940 the men of the 18th Division received orders to begin constructing defences along the Norfolk coast as part of the Eastern Command line. The initial priority was to protect the ports of King's Lynn and Great Yarmouth, but attention soon turned to the rest of the coast and by early June pillboxes and other concrete defences were being built at many locations (Dobinson 1996d, 65). Work continued apace throughout the autumn, and the winter of 1940 was seen as a time to get the beach defences ready for a potential spring attack.

The first lines of defence against a seaborne invasion were the beaches, dunes and cliffs. These were obstructed with a series of linear defences designed to impede or prevent the progress of an invading enemy. Different kinds of defence obstruction were often used in conjunction with one another, with several (sometimes all) types present on a single short stretch of coast. The simplest consisted of lines of coiled barbed wire arranged on posts extending along the beach. Depending on the provision of other defences, one or more lines of barbed wire were present on each beach. Further barbed wire running from the cliffs or dunes down to the low water mark sub-divided the beaches into separate areas. The partitioning of the beaches in this way meant that if an invading force crossed one line of defences, it would not be able to travel easily along the beach to move inland elsewhere. Most sections of the coast in the east of the county appear to have had barbed wire defences in place by late summer 1940. Barbed wire defences were also routinely used to surround minefields and protect military establishments.

Barriers of tubular steel scaffolding were placed along beaches from the summer of 1940 as an obstruction to enemy landing-craft. From early 1941 scaffolding was also used as an anti-tank defence to complement other forms of obstruction (Dobinson 1996d, 147-8). Aerial photographs show that most of the scaffolding defences on the Norfolk coast were constructed between early and mid-1941, suggesting that they were primarily positioned as anti-tank defences. Scaffolding was used in this way both on beaches where only dunes or low cliffs were present, as at Scratby (NHER 27278), and on those where the cliffs were more substantial, e.g. Walcott (NHER 38789).

Anti-tank ditches were excavated both parallel to the coast to supplement beach defences and further inland to create stop lines and defended areas. They included both man-made ditches and enhanced natural obstacles such as rivers and field boundary ditches. Various

different profiles of artificial ditch were constructed to serve as one-way and two-way defences, although these distinctions are not clear on the aerial photographs. The ditches were generally about 4m wide with spoil banks on one or both sides and were often excavated in a zigzag line to maximize covering fire from pillboxes and other defensive positions (Dobinson 1996d, 140-1). The anti-tank ditches on the Norfolk coast appear to have been excavated during the autumn of 1940, with aerial photographs showing one section at Bacton in the process of being dug in September of that year (NHER 38791). A rare section of anti-tank ditch which still survives as an earthwork was mapped at Weybourne (NHER 32505).

Existing features that were enhanced to provide additional anti-tank defences included small rivers and drains. At Lessingham over 2.5km of a natural watercourse was dredged, with the soil piled up on one bank, to continue an artificial anti-tank ditch to its north (NHER 38560). Larger scale dredging was carried out on drains running parallel to the coast at Snettisham and Heacham resulting in over 4.5km of heightened banks forming an extensive anti-tank defence (NHER 26804).

Anti-tank blocks were recorded at fifty-eight separate locations around the coast. Some of these were single blocks or small groups forming part of a road block, whilst in other cases long lines of blocks were mapped, sometimes extending for hundreds of metres. The most common type of anti-tank block was undoubtedly the concrete cube. At least thirty-seven sites are recorded with this specific type of obstruction, although in reality almost all of the sites probably had cubes. Anti-tank blocks were among the earliest defences placed along the coast, with small numbers in place blocking beach access points and other obviously weak locations by late summer 1940. These were supplemented later in 1940 and 1941 by rows of blocks forming a more continuous line of defence.

Road blocks were recorded at seventy-four locations in the Coastal Zone. Of these, thirty-four sites were located in Great Yarmouth with a further seven lying in adjacent parishes. All but one of the remainder were either located at Cromer, which accounted for nine sites, or between these two towns. This distribution is a direct reflection of the availability of the wartime aerial photographs. Only a single example, consisting of a rare anti-tank block with projecting ironwork, was recorded in the west of the county, at Babingley Bridge (NHER 32383) within the NMP pilot study area.

Some minor roads used to access the beaches were completely stopped up with anti-tank blocks, preventing vehicular use for the duration of the war. Elsewhere anti-tank blocks were used in single, and sometimes double, rows to narrow roads to a single carriageway that could easily be blocked by a mobile obstacle if the need arose. Road blocks of this type were

frequently, although not always, used in conjunction with lines of blocks, anti-tank ditches and barbed wire defences.

More elaborate were road blocks that comprised a series of slots in the road surface into which straight posts or bent rails, known as 'hairpins', could be inserted. The possible locations of this type of road block were sometimes only visible as areas of replaced road surface on 1946 RAF aerial photographs. They occurred on both minor paths – as at Cromer, where they were used to block access to the pier (NHER 38850) – and on main roads like Yarmouth Road at Caister-on-Sea (NHER 27517). At the latter location two such road blocks were placed 160m apart, continuing lines of barbed wire, scaffolding and an anti-tank ditch that effectively cut off the Great Yarmouth peninsula (Fig. 11.4). These defences formed part of a stop line that encircled Great Yarmouth, linking anti-tank ditches and barbed wire defences with the rivers and marshland.

Also in Great Yarmouth an unusual, probably unique, type of road block may be visible on early World War Two aerial photographs. Early in the war herring barrels (a readily available resource in the town) were filled with concrete and used to barricade every road leading from the sea front (Tooke & Scarles 1989, 7). Faint lines visible on photographs taken in 1940 and 1941 may mark the location of some nineteen of these barricades. They appear to have been fairly short-lived and were probably removed once the immediate threat of invasion had passed.

Similar measures were taken on railway lines to prevent enemy vehicles, principally tanks, from using them as access routes in the event of an invasion. Slots for post and hairpin obstructions were located on several sections of railway line, especially on the approach to bridges, in Great Yarmouth and elsewhere. Their distribution reflects that of road blocks, with no rail blocks being recorded in the western half of the county due to the lack of wartime aerial photographs for that area.

Minefields were used to reinforce other lines of defence, and were located both on beaches and in adjacent areas of dune or reclaimed marshland. A total of thirty-four minefields were identified around the coast. Some were very extensive, with one at Snettisham stretching for over 1km along the coast in front of the sea bank (NHER 26637) and a group of minefields at Winterton-on-Sea continuing for over 6km (NHER 42182-3, 42368, 42444, 42453). Characteristic lines of mounds and areas enclosed by barbed wire are visible on some low-level wartime aerial photographs. At Caister-on-Sea (NHER 27517) a large part of a minefield had been detonated by late summer 1940, possibly only months after it had been laid out. This was the result of a bomb dropped just to its north during an air raid on 24th September 1940, which also caused damage to nearby houses (Tooke 2000, 48). The process of clearing the mines after the end of the war was both slow and dangerous, and it was not until

1966 that the beaches at Trimingham and Sidestrand were reopened (Bird 1999, 56). The lines of small craters left when the mines were removed show clearly on late 1940s and 1950s aerial photographs making these sites relatively easy to identify.

Pillboxes are undoubtedly the most ubiquitous of the anti-invasion defences, to the extent that they have been described as the, 'prime archaeological type fossil of the Second World War' (Dobinson 1996d, 157). This stems from the fact that nationally many thousands were constructed over a remarkably short period of time during 1940 and 1941, and although only a small percentage survives, they are still a prominent feature of the coastal landscape.

World War Two pillboxes were recorded at 430 sites within the Coastal Zone. However, this number is misleading for two reasons. Firstly, it includes all sites with pillboxes. Consequently, in addition to those specifically positioned as anti-invasion defences, military sites such as camps, radar stations, airfields and gun batteries, which were provided with similar defences, also form part of the total. Furthermore, this figure only represents the number of sites where pillboxes were recorded, not the individual structures themselves. Many sites, especially the large areas of coastal defences, include two or more pillboxes. Consequently, it might be reasonable to expect that the actual number of pillboxes in the Coastal Zone was originally around double the number of recorded sites. An idea of the density of pillboxes along the Norfolk coast can be gained from a 3km sample area between Bacton and Walcott in the northeast of the county (NHER 38789 & 38791). Along this section no fewer than eight pillboxes were located at the edge of the beach and on top of the cliffs. These were supported by a further six pillboxes (four definite and two possible) and a section post within 300m of the shoreline. The earliest examples recorded on the Norfolk coast were, like other anti-invasion defences, in position by the summer of 1940.

The most common form of pillbox was the hexagonal Type 22. Although only eighty-five sites are recorded as being specifically of this type, this is a result of issues surrounding the monument indexing on the HER database outlined at the start of this chapter, rather than a reflection of the true numbers present. Type 24 and Type 26 pillboxes and machine gun posts were also recorded within the Coastal Zone. Modified designs and variant pillboxes were mapped as well. A surviving pillbox at White Gate Farm, Caister-on-Sea appears to be half of a Type 24 design built up against an existing barn wall (NHER 32676) (Fig. 11.4). Many pillboxes were camouflaged and low-level oblique aerial photographs proved useful in revealing the variety of techniques employed. In some cases the camouflage was so effective that it is only on post-war photographs, where it has been removed, that the pillbox can be identified. The simplest techniques used included camouflage paint schemes and placing soil and vegetation on top of the pillbox (e.g. NHER 32674, Caister-on-Sea). Some pillboxes were practically buried in the cliffs rendering them almost invisible, as was the case with a heavy machine gun pillbox at Weybourne Hope (NHER 38625; Bird 1999, 34). Other pillboxes were

disguised as buildings, either with a simple pitched roof (e.g. NHER 32673, Caister-on-Sea) or as a complete structure (e.g. NHER 38783, Happisburgh). In urban settings more elaborate building disguises were often required, with a Type 22 pillbox adjacent to Cromer pier being camouflaged as an ice cream stand (NHER 38850) (Fig. 11.5). More elaborate concrete defensive positions were created inside existing structures, such as the standing remains of Bromholm Priory (NHER 1073; Bird 1999, 37-8). However, by their very nature, such defensive positions were not obvious on aerial photographs.

Spigot mortar emplacements were often positioned in conjunction with pillboxes to cover road blocks and other strategic locations. Permanent positions for these anti-tank weapons comprised a pit containing a circular concrete pedestal on which the mortar itself was mounted. These emplacements show clearly on aerial photographs and in excess of 100 sites were recorded in the Coastal Zone. Allan Williams turrets – small steel-domed gun emplacements – were recorded at seven locations. In addition to these structures many hundreds of slit trenches and weapons pits were scattered along the coast providing a near continuous circuit of defensive positions.

The threat of invasion did not come only from the coast, with the possibility of an aerial invasion also present. Aircraft obstructions were positioned on areas of open ground such as heaths and large arable fields that could potentially have been used for landing troops in the event of an invasion. Anti-landing or 'anti-glider' trenches were arranged to prevent enemy aircraft or gliders from landing, or to damage aircraft so badly that they could not take off again. These features were only identified at three locations within the Coastal Zone: North Wootton (NHER 36873), Bacton (NHER 38990) and Caister-on-Sea (NHER 27516). Ditches and low banks were present across arable fields at all of these locations by the late summer of 1940. At Caister-on-Sea the trenches incorporated existing field boundary ditches that had been cleaned out and widened. Other types of aircraft obstruction, such as lines of posts or felled trees, were not recorded in the Coastal Zone. The anti-landing trenches in arable fields caused inevitable disruption to agricultural activities. It is likely that by the later years of the war, when the invasion threat had diminished, most had been filled in and none of those recorded in the Coastal Zone was visible on 1946 RAF aerial photographs. The removal of these features before the end of the war, and the absence of 1940–44 aerial photographs for some sections of the coast, has probably limited the number of aircraft obstructions recorded during the Coastal Zone mapping.

#### **Case Study XXIV: Bacton Green, Bacton (NHER 38791)**

In 1940 the coastline at Bacton Green comprised low cliffs, which decreased in height to the level of the beach at a point known as Bacton Gap. This location corresponded with the junction of two roads leading roughly west and south from the beach. The area to the south of Bacton Gap was occupied by the hamlet of Bacton Green with a small holiday camp on the

cliffs to its southeast. The modern coastline has retreated through erosion, but the area is still occupied by the hamlet of Bacton Green and several holiday camps.

The anti-invasion defences at Bacton Green incorporated most of the elements described in the section above to provide a typical series of linear obstructions. The defences in this area had to address several issues relating to the existing landscape. The cliffs provided a natural barrier but their usefulness varied depending on their height, resulting in different defensive requirements at different points. Secondly, the presence of houses and other buildings within the area to be defended was an additional factor in the positioning of the defences. RAF vertical aerial photographs dating to 5th September 1940, 16th July 1941 and 4th January 1943 were consulted, with oblique photographs from 16th August 1940 and 7th August 1941 providing additional detail. This sequence of aerial photographs from the first half of the war provided a series of 'snapshots' of the construction and development of the coastal defences.

The earliest defences, which were in place by September 1940, were concentrated at Bacton Gap – the most vulnerable point within the case study area due to the ease of access from the beach. A Type 22 pillbox was constructed at the junction of the two roads there. A line of fourteen anti-tank blocks extended along the edge of the low cliff immediately to its northwest with a slit trench located at its end. Continuing for 350m to the northwest from this point was an anti-tank ditch. Aerial photographs taken on 5th September 1940 actually show it being dug by a dragline excavator, providing an unusually precise date for the construction of such defences. The anti-tank ditch turned back towards the cliff edge at its northwest end. By this point the cliffs were approximately 10m high and provided an adequate obstruction in their own right. A rectangular structure of unknown function was located between the ditch and the cliff edge near its northwest end. The road to the south of the pillbox at Bacton Gap (Beach Road) was obstructed by three anti-tank blocks. The cliffs to the southeast of this point had not been reinforced with any linear obstructions by the start of September 1940, although three slit trenches were cut into the clifftop. It is likely that further defences were added to this section of the cliffs during the months that followed as they were mostly in place by July 1941.

By that time scaffolding was in place along the beach, terminating at the northwestern end of the case study area, close to the end of the earlier clifftop anti-tank ditch. A break in the scaffolding was left at Bacton Gap, presumably to allow local fishermen to get their boats on and off the beach. Just to the southeast of the access at Bacton Gap, an area of beach at the foot of the cliffs was enclosed with barbed wire and this may have been mined. Anti-tank obstructions had been constructed on the cliffs to the southeast of Beach Road, probably during the late autumn of 1940. The cliffs in this area were occupied by houses and other buildings requiring different defences to the open ground to the northwest of Bacton Gap. Short sections of anti-tank ditch were excavated between houses, with anti-tank blocks and the buildings themselves filling in the gaps to form a continuous line of defence. It is not

known if any of the buildings were reinforced for this purpose or if loop-holed walls added to the defences. To the southeast of New Road (now Mill Lane), which was itself obstructed by anti-tank blocks, a continuous anti-tank ditch extended for 720m along the top of the low cliffs. Further defensive positions had also been added along this section of coast. Three more pillboxes, apparently all Type 22 designs, were placed on the seaward side of the anti-tank ditches and more slit trenches and weapons pits had been excavated.

As early as August 1941 coastal erosion had impacted on the defences with some of the line of anti-tank blocks adjacent to the pillbox at Bacton Gap having fallen onto the beach. By January 1943, and probably much earlier than that date, a new line of twenty anti-tank blocks had been positioned to the rear of the pillbox, blocking both access roads to the beach. Typically few changes appear to have occurred during the later years of the war, with an additional slit trench on the cliffs being the only new defensive feature visible in 1946.

RAF aerial photographs from June 1946 show that post-war clearance of the defences had already started by this date. Scaffolding and barbed wire had been cleared from the beach and the anti-tank ditches to the southeast of Bacton Gap had been filled in. However, the ditch to the northwest of the settlement still remained open. More difficult to remove were the anti-tank blocks; only those obstructing roads appeared to have been cleared by this time. At Bacton Gap more blocks and the pillbox had fallen onto the beach. By February 1953, the date of the East Coast Floods, aerial photographs show that all of the defences had been removed from the area of settlement, with only scattered anti-tank blocks, broken concrete from pillboxes and loose fragments of scaffolding visible on the beach. Today, none of the anti-invasion defences in the case study area survives. This can be contrasted with the two areas of the Norfolk coast examined for the English Heritage Defence Areas Project, at Winterton-on-Sea (e.g. NHER 18355, 42444 & 42452-54) and Weybourne (e.g. NHER 11335), which were selected as 'discrete areas of good anti-invasion defence survival' (Foot 2006, 35). The absence of surviving remains at Bacton Green, and at many other locations along the Norfolk coast, means that the role of wartime aerial photographs in establishing the extent and type of defences employed is of paramount importance. However, it must be remembered that aerial photography alone cannot always provide the complete picture (Newsome 2003, 48).

### **11.3.2 Emergency Coastal Batteries**

A major change in coastal defence strategy occurred in May 1940 when it was decided to treat the coast as a linear frontier rather than to concentrate solely on defending ports and harbours. This policy shift was a result of the direct threat of invasion and the recognition that the Royal Navy would not be able to protect the whole coastline against a potential seaborne landing (Dobinson 2000a, 58).



The new priority was to erect emergency coastal batteries at a series of locations, and within three days of the change in strategy forty-six batteries were planned around the coastline of the United Kingdom. These were each to be equipped with two guns, initially with sandbag emplacements and temporary buildings. The suggestion that these stations should be manned by the newly formed Home Guard was rejected and the gunners were brought in from the Navy and Army. Ultimately a total of 125 batteries were constructed nationally – seventeen in Norfolk. The guns were drawn from a stockpile of Royal Navy ordnance that had been retained from vessels scrapped after the First World War, and included 6 inch, 5.5 inch, 4.7 inch, and 4 inch types. The early sandbag emplacements were gradually replaced with brick and concrete gun houses of various designs at most sites.

Details of individual batteries vary and information about their armaments, operational period and units is not always available. At least eleven 6 inch batteries were located in Norfolk with known sites at King's Lynn (NHER 25792), Hunstanton (NHER 26938), Cley Eye (NHER 24184), Sheringham (NHER 21297), Cromer (NHER 32566), Mundesley (NHER 14142), Happisburgh (NHER 32636), West Caister (NHER 27475), Great Yarmouth (North Denes, NHER 32675, and Links, NHER 42473) and Hopton (NHER 42486). At least seven of these were in place by October 1940 (Dobinson 2000b, 309-10). A 4 inch battery was located at Winterton (NHER 35863) and a 4.7 inch battery sited at Happisburgh (NHER 18472). More obscure sites with uncertain armaments were also recorded at Brancaster Bay (NHER 31113) and High Cape (Holkham, NHER 36852).

Research during the NMP mapping led to the recording of an unusual battery located 1.5km inland at Nova Scotia Farm, West Caister (NHER 27475). This battery had two gun houses which faced southeast towards Great Yarmouth, rather than eastwards out to sea. It was apparently constructed as an emergency battery to defend Great Yarmouth harbour and had two 6 inch guns in sandbag emplacements. Brick and concrete gun houses were later constructed but it is unlikely that the guns were refitted before the site went out of use in 1941 (Tooke 2004, 35). No aerial photographs dating from the operational period of this battery were available but the site is clearly visible on post-war photography. Both of the gun houses and a Nissen hut are believed to survive at the site, although it has not been possible to confirm this at the time of writing.

The batteries were not always ideally located, with several being positioned on top of unstable cliffs. The guns at Hunstanton battery were fired only once, which resulted in fears that the cliff would collapse, and the 6 inch battery at Happisburgh had to be replaced by a new 4.7 inch battery further north because of the rapidly eroding cliffs (see Case Study XXV below). Some early batteries were short-lived for tactical reasons. Clenchwarton battery was closed in 1942 with its guns being moved to Northumberland. As the threat of invasion further declined, so too did the requirement for coastal defence. From 1943 many more coastal batteries were

scaled down with Hunstanton, Brancaster and Cley all having closed by the following year, while others such as Hopton were transferred to Home Guard control. The remaining sites stayed operational until the end of the war. Some, such as the Gorleston Golf Links battery, were retained briefly into the post-war period.

Each battery was accompanied by a range of associated buildings, usually including a two- or three-storey battery observation post to direct the guns. Two of these survive, with a largely complete example at Clenchwarton and another at Hunstanton that was later used as a coastguard lookout tower. Existing structures were sometimes used as observation posts, with Winterton lighthouse (NHER 8576) and apparently also the Grand Hotel at Mundesley serving this function for adjacent batteries. Coastal artillery searchlights were identified at most sites, often on the cliff edge some distance from the guns. However, the simple rectangular form of their housings often makes them difficult to distinguish from other military structures. Batteries were also accompanied by a range of domestic buildings, including wooden huts, Nissen huts and more permanent brick and concrete structures.

Coastal batteries were supplied with a range of ground defences including barbed wire perimeters, pillboxes, weapons pits and light anti-aircraft positions. Of these, probably the most significant is the Type 27/6/X pillbox. This was a large hexagonal pillbox with a central circular well for a light anti-aircraft weapon such as a Lewis gun. It was a variant of an octagonal type designed for airfield defence, but the six-sided version was only constructed at coastal batteries (Bird 1991, 22). The specific function and consequently limited distribution of this pillbox make it a rare type. Large hexagonal pillboxes, probably all of Type 27/6/X, were mapped at six of the battery sites in Norfolk. Of these only three survive: at Cley (NHER 23194), Happisburgh (NHER 16972) and Great Yarmouth (NHER 32675). The existence of the Great Yarmouth example, which is entirely encased in concrete and forms an anomalous projection from the sea wall, was only recognised as a result of the NMP recording. Various methods were used to camouflage battery sites, including disguising buildings as holiday chalets and the use of netting to cover gun houses. Possible bombing decoys for Winterton and Hopton batteries were identified (see Section 11.3.3).

#### **Case Study XXV: Happisburgh 4.7 Inch Coastal Battery (NHER 18472)**

A World War Two coastal 4.7 inch gun battery was located on the clifftop to the northwest of Happisburgh village. This site was constructed in late 1940 to replace a 6 inch battery 1.3km further to the southeast (NHER 32636). The earlier emergency battery had two gun houses with 6 inch guns and a two-storey observation post disguised as a holiday chalet. It had been located on the cliff edge and was instantly under threat from the rapidly eroding cliffs. Whether or not the problem was exacerbated by the guns being fired is not clear. Aerial photographs show that the first site was disused and its replacement fully operational by July 1941. The 4.7 inch battery had two brick gun houses with flat concrete roofs. Typically, these

were linked by underground magazines and stores. Both of the gun houses had pitched thatched roofs to camouflage them as haystacks (Fig. 11.7). The two-storey battery observation post to the southeast of the gun houses was camouflaged as a civilian building. The two searchlights for the battery were located some 200m southeast and 330m northwest of the gun houses. Both were recessed into the clifftop with a sunken concrete track leading to the cliff edge. Wooden huts associated with the site were concealed along hedgerows. The core of the battery was protected by a rectangular barbed wire enclosure, divided into three sections. The landward side of this was protected by a Type 22 pillbox and at least one spigot mortar emplacement. The site was further surrounded by a polygonal barbed wire enclosure that included the searchlight positions, and was protected by three Type 27 pillboxes and other gun emplacements. The defences surrounding the battery linked in to the continuous line of barbed wire and other anti-invasion defences along the cliffs and beach. The Happisburgh battery was transferred to Home Guard control in 1943 and reduced to a 'care and maintenance' status (Dobinson 2000b, 327). With the exception of the West Caister site, the 4.7 inch Happisburgh battery is the best preserved of all the coastal batteries in Norfolk. Both of the gun houses survive with their underground magazines, though they are inaccessible. To the rear of the gun houses are two extant pillboxes, a common Type 22 and a rare Type 27.

### **11.3.3 Anti-Aircraft Defences**

Anti-aircraft (AA) defences form a significant component of the World War Two archaeology of the Norfolk coast. Norfolk was not only home to several towns, airfields and other installations which were bombing targets in their own right (not least Great Yarmouth with its Naval base and harbour), but it also lay in the path of enemy bombers from the continent, who frequently jettisoned any spare bombs over the county before making their return crossing of the North Sea. The numerous bomb craters mapped by the project, often visible on marshland or in similarly remote locations, may mainly reflect these more random or opportunistic attacks.

A wide variety of different schemes was utilised to hamper enemy bombing raids and to alleviate their effects. Active defence involved a range of artillery positions, which by the end of the war often took the form of substantial permanent batteries and emplacements. More passive measures, such as the use of searchlights and barrage balloons, reduced bombing accuracy and made enemy aircraft an easier target for AA artillery and Allied fighter planes. Bombing decoys were used to draw enemy attacks away from their intended target, while air raid shelters (discussed in Section 11.3.8 below) provided a last resort for the protection of civilian populations and military personnel alike.

## *Anti-Aircraft Batteries*

### 11.3.3.1.1 Heavy Anti-Aircraft Batteries

Protection against aerial attack was a crucial element of Norfolk's World War Two defences, and the county possessed a range of anti-aircraft artillery for active defence. As was the case elsewhere in the UK (with the exception of London), the heavy anti-aircraft (HAA) batteries were organised into Gun Defended Areas (GDAs), each protecting one or more targets or Vulnerable Areas (VAs) (Dobinson 1996a, 64). Within the Coastal Zone documented HAA batteries, equipped with large calibre guns, are confined to the east coast, where Great Yarmouth's five batteries, part of the Yarmouth and Lowestoft GDA, have been mapped (Dobinson 1996b, 489) (Fig. 11.8). For the most part, these all conform to the standard layout, with four large emplacements arranged around a central command post, and associated radar platforms, searchlights, ground defences and huts visible nearby. A Gun Operations Room (GOR) for Yarmouth, where fire-orders would be received and then sent out to local batteries, was located at the HAA battery off Beccles Road, Gorleston on Sea (YH3 in military documents; NHER 32667). The GOR is visible on the aerial photographs as a heavily protected range of interconnected buildings in the northwest corner of the site, entirely surrounded by earth revetments and blast walls. It probably also functioned as the GOR for the local Diver batteries (Dobinson 1996e, 238; see below).

Under the Nucleus Force scheme three of Great Yarmouth's batteries were retained to form part of the post-war HAA layout. Two – YH1 West Caister (NHER 27272) and YH2 Gorleston (NHER 32668) – were Battle Headquarters (BHQs), and their weapons remained in place. The third – YH4 at Mautby (NHER 29751) – was designated an 'Off site', where weapons and fire-control instruments were stored in nearby depots (Dobinson 1996a, 231-2, 237). By the end of the 1950s the development of nuclear weapons and surface-to-air missiles had rendered conventional anti-aircraft artillery of this type obsolete.

Other World War Two HAA sites recorded within the Coastal Zone include two examples of a late form of HAA battery known as a Diver battery (see below). A variety of gun emplacements and batteries were also mapped at the anti-aircraft training camp at Weybourne (NHER 11335), on the north Norfolk coast. As well as being visible within the camp itself, they are also evident on Kelling and Salthouse heaths to its south and southwest. A further possible HAA training site was identified at Paston (NHER 39109). In the absence of documentation, it is difficult to determine the exact function of these sites: while they may have been constructed for practice they could also have seen active service, at least on an opportunistic basis.

#### 11.3.3.1.2 Diver Batteries

A small number of the AA defences identified were created as part of Operation Diver, which commenced mid-June 1944 and sought to counteract V1 flying-bomb attacks. Following the first flying-bomb attacks on London, a strip of temporary anti-aircraft batteries was erected in Kent and Sussex. This was known as the Kentish Gun Belt (Dobinson 1996e, 6). In July 1944 these guns were moved to the south coast forming the Coastal Gun Belt. In late September 1944 orders were issued to re-deploy these guns and to extend the deployment to the east coast, forming the Diver Strip. This ran from the GDA at Great Yarmouth in the north to Clacton in the south (Dobinson 1996e, 8). This strategic change was in response to a newly intensified bombing offensive against the east coast, which began on 16th September 1944.

Out of the 163 batteries planned, only eighty-five sites were erected along the Diver Strip. Some were adaptations of existing coastal HAA sites, as at West Caister (NHER 27272); others, such as the site on Gorleston Golf Links (NHER 42483), were completely new batteries (Dobinson 1996e, 87). A further thirty-nine sites were erected as part of the Diver Fringe, which ran along the Lincolnshire and Yorkshire Coast. These Fringe sites were all constructed between October 1944 and February 1945; the programme closed down on 29th March 1945, when bombing ceased (*ibid.*, 10).

The Diver Strip defences located within Norfolk appear to have been some of the earliest constructed: between 18th and 21st September 1944 three new Diver sites were established around Great Yarmouth and Lowestoft (Dobinson 1996e, 87). One of these batteries has been identified on aerial photographs of Gorleston Golf Links (NHER 42483). The site is not visible on aerial photographs from August 1944, but is clearly apparent in August 1945, indicating that it is likely to have been built as part of Operation Diver. The site also has one of the layouts characteristic of Diver sites: the guns are all arranged in a straight line. The arrangement of the gun emplacements and the associated magazines and huts indicates that the battery was originally intended for six guns, but only four were ever installed. The two end emplacements do not show signs of ever having had a gun mounted on them. The fact that the emplacements are all placed in a straight line indicates a very early deployment of the site during Operation Diver. From 23rd September it was ordered that the two flank guns should stand proud of the central guns to allow low angles of engagement (*ibid.*, 91-3). The plan of the site therefore appears to corroborate that the Gorleston site was constructed as part of the first wave of Diver Strip defences. The available low-level photography of the site clearly shows the guns, possible pile platforms, a tracker tower, radar equipment and possible radar screens, also known as 'clutter' screens. The presence of asbestos huts and tents suggests that there was some on-site accommodation. The site is referred to in military records as YH2, presumably because of its relative proximity to, and relationship with, the conventional HAA battery of that name 1.8km to the north (NHER 32668).

The HAA battery at West Caister (YH1; NHER 27272) is recorded as having also been incorporated into the Diver Strip. The site was already equipped with four static 3.7 inch guns. Between July 1944 and June 1947 a concrete gun-laying radar platform was constructed. This had a ramp leading to the platform and is likely to have been for the GL10 radar listed as being utilised at this site (Dobinson 1996e, 245). The radar platform and an additional Nissen hut are all that can be seen of the activity associated with Operation Diver. This is due to a lack of aerial photograph coverage spanning this phase of the war. A nearby site (NHER 27527), however, attests to probable Diver related activity. Here, between 11th September 1944 and August 1945, a number of curved profile and pitched roof structures were constructed; in addition, evidence of some recently removed structures is visible in 1945. It seems likely that this site played an ancillary role to the main Diver defences at the HAA battery.

#### 11.3.3.1.3 Light Anti-Aircraft Batteries

While NMP mapping and interpretation has added much detail to our knowledge of coastal HAA batteries, in terms of new sites it has perhaps been most significant in identifying large numbers of light anti-aircraft (LAA) emplacements. These make up the vast majority of the sixty-three anti-aircraft batteries recorded during the project; it is highly probable that many of the individual, non-specific gun emplacements that have been identified were also mountings for LAA guns. LAA weapons, intended for use against fast, low-flying aircraft, were provided for the localised protection of specific targets, known as Vulnerable Points (VPs). These were often military installations, such as radar stations or airfields, but also included factories and dockyards (Dobinson 1996a, 64). A probable LAA emplacement at Choseley (NHER 26671) may have been an outer defence for Docking Airfield, while pillboxes at Winterton emergency coastal battery (NHER 35863) had what may have been LAA mountings on their roofs.

With the exception of the area around Weybourne Anti-Aircraft Training Camp (Case Study XXX), most of the LAA sites are found on the east and northeast coast. A similar pattern is evident amongst the World War Two searchlight batteries (see below) and this may represent a belt of defences covering the approach to Norwich from the Low Countries. It may equally, however, reflect the larger quantity, and better quality, of wartime aerial photographs available for this area. This has allowed more sites to be identified as specifically relating to anti-aircraft defence, rather than being classified more generically as gun emplacements.

#### **Case Study XXVI: Anti-Aircraft Artillery at Great Yarmouth (Fig. 11.8)**

The existence of high resolution, low-level aerial photographs from 1945 for much of the Great Yarmouth area, together with a greater spread of photographs across almost every year of the war, has allowed the town's anti-aircraft defences to be mapped more comprehensively, and in greater detail, than anywhere else on the coast. As discussed above, the Great Yarmouth VA was provided with five HAA batteries, with a GOR at Beccles Road, Gorleston (NHER 32667), at the battery designated YH3 (Dobinson 1996b, 489). The

town's other HAA batteries were arrayed to its north and south; the marshland to its west was presumably unsuitable for building this type of defence. As described above, later in the war two Diver HAA batteries were established to the north and south of the town to counteract attacks by V1 flying-bombs.

The initial location of one of the batteries, YH4, is uncertain. In 1942, an HAA battery equipped with four 3 inch guns is documented at Yarmouth racecourse, on the North Denes to the north of the town. Although an extensive military site, including an anti-aircraft dome trainer, has been recorded here (NHER 27538), there is little evidence of the battery, other than a possible temporary emplacement for a single mobile gun. In early 1942 the North Denes coastal battery (NHER 32675), located on the seaward side of the racecourse, was due to be upgraded by the installation of three 5.25 inch guns. The latter were dual-purpose coast artillery and anti-aircraft guns, but they were never emplaced. By the end of the war, YH4 had been moved 4km to the west, to Decoy Farm, Mautby (NHER 29751), where a standard arrangement of four fixed emplacements is visible on photographs taken in 1945.

Great Yarmouth was also provided with numerous LAA positions, many of which appear to have been fixed positions, most probably for Bofors guns. At least twenty of these positions conformed to standard designs and these are depicted on Figure 11.8. Unlike the HAA batteries, they were spread fairly evenly across the Great Yarmouth VP, surrounding the entire town. Many of these sites had not been recorded in the NHER prior to the NMP. It is notable that there is a discrepancy between the locations of those few that had been recorded from documentary evidence (Dobinson 1996c, 761), and those visible on the aerial photographs. None of the grid references for the four sites listed by Dobinson corresponds with a mapped emplacement. The records could relate to rooftop LAA positions, which might be difficult to identify on the aerial photographs (none was mapped by the project). It is more likely, however, to reflect the inaccuracy of military grid references, particularly when they have been converted to a National Grid Reference. This highlights the benefits of aerial photographs, and the NMP methodology, for identifying this type of military site.

Most of the sites recorded by the NMP were ground-level emplacements, comprising a brick or concrete lined gun pit, incorporating features such as ammunition lockers and predictor pits for example (see Lowry 1996, fig. 28 and Dobinson 1996a, fig. 27). Generally some protection was afforded by an earthwork bank surrounding the emplacement. In some cases the holdfast, and occasionally even the gun itself, is visible on the aerial photographs. Four of the emplacements were Bofors towers, a rare type of emplacement of which little more than eighty were built (Dobinson 1996a, 166-7). These were generally constructed in urban areas, when rooftop sites were unavailable. By raising the level of the gun position above surrounding buildings they provided an all-round field of fire. This strategic necessity is reflected in the siting of Great Yarmouth's towers close to the town centre. Ancillary

installations, perhaps housing radar or predictor equipment, are visible at many of the LAA sites. Basic accommodation and ground defences are evident at most of the outlying sites located to the west of the town.

### *Searchlights*

The coastal chain of anti-aircraft guns was supplemented by a network of searchlights. Together with barrage balloons (see below), these forced enemy planes to fly higher, reducing the accuracy of their attack and making them an easier (and, at night, more visible) target for both anti-aircraft artillery and fighter planes. The Royal Artillery took over responsibility for manning searchlights early in the war, and their layout was organised around the same Gun Defended Areas (GDAs) as the anti-aircraft guns, supplemented by searchlight belts on the approaches to major cities (Dobinson 2000e, 2).

The NMP has mapped and recorded information for forty-three searchlight sites in the Coastal Zone. Although many of these sites were previously recorded, aerial photographic interpretation and transcription has frequently corrected grid references, accurately mapped the extent of sites, and added detail to what was often minimal recording. A proportion of these sites were coast artillery searchlights (CASLs), typically found near coastal gun batteries and consequently discussed in Section 11.3.2 above. As was the case with AA artillery, the majority are located along the east and northeast coast, presumably to cover the approach to Norwich from the Low Countries. Some were isolated, while others appear to have been embedded within more extensive military sites encompassing a variety of defences and other installations. A typical site comprised several circular emplacements housing one or more lights and a predictor, with a variety of huts and ancillary structures, often including defences such as gun emplacements and pillboxes. A more extensive site at Gorleston-on-Sea (NHER 42518) may have been the troop headquarters for the brigade manning the lights within Great Yarmouth GDA. At a number of sites, such as one at Somerton (NHER 42471), a later form of searchlight battery, employing a radar-controlled 150mm projector mounted on a wheeled trailer, is evident (Roger Thomas, English Heritage, pers. comm.).

### *Barrage Balloons*

An additional form of passive air defence was provided by barrage balloons, which forced enemy planes to fly at higher altitudes to avoid both the balloons and their steel tethering cables. This served two purposes: firstly the accuracy of enemy bombing was reduced, and secondly aircraft flying at higher altitudes were an easier target for anti-aircraft artillery, searchlights and fighter planes. Later in the war the balloons were used to stop flying-bombs. All of the fifteen barrage balloon sites mapped by the NMP in the Coastal Zone were part of the Great Yarmouth barrage, which formed a protective barrier around the town and harbour.



The sites comprise a number of distinctive elements, each visible in a variety of different ways. Where photographs taken in the first few months of 1944 are available, the balloons themselves can often be seen. At most sites where balloons are not visible, concentric circles of tethering blocks are the most distinctive element. Associated huts and structures are usually visible nearby; often one is sited in a radial position to the central tethering platform. Although little survives of these sites today, in at least one case (NHER 15089) the site has produced a distinctive array of cropmarks (Fig. 11.9).

An unusual adjunct to this class of site are the Naval 'Kite'-type balloons that can be seen flying above vessels moored along Great Yarmouth's quayside on wartime aerial photographs. Typically these were used to prevent low-level aerial attacks on ships. A depot on the South Denes (NHER 27640), part of the town's Naval base, appears to have been used to store balloons of this type, with lines of the furled balloons visible within the compound. It is possible that they were stored out in the open as part of 'Operation Fortitude', a major subterfuge operation intended to convince the Germans that the Allies were preparing an embarkation along the southeast coast for an invasion of Pas de Calais, and that the preparations for the Normandy invasion were themselves a subterfuge (Roger Thomas, English Heritage, pers. comm.).

### *Military Decoys*

Like many parts of the UK during World War Two, Norfolk was provided with a number of bombing decoys, to protect its airfields, Naval bases, urban centres and defences. Bombing decoys, which employed a variety of false structures and installations, lights and fires, were designed to draw enemy attacks away from their intended target, by imitating an ineffective blackout, for example. The county in fact saw some of the earliest attempts at using tactical deception against aerial attack: during World War One flares were lit on the Navy's night landing grounds at Holt and Burgh Castle in order to draw attacks by airships (Dobinson 2000f, 3).

At present ten military decoy sites are recorded within the Coastal Zone by the NHER; the NMP has mapped and recorded information for eight of these sites, nothing being visible on the consulted aerial photographs for the remaining two locations. Most were K (daytime) and/or Q (night time) decoy sites for airfields. The decoy at Sedgeford (NHER 13162; a K and Q site for Bircham Newton) utilised an existing World War One airfield. Little of the decoy apparatus is visible at these sites, even on early photographs taken in the immediate post-war period. This is presumably because it is unrecognisable or too insubstantial to be visible, or because it had already been removed, although the control bunker for the Q sites at Salthouse (NHER 13366) and Warham St Mary (NHER 23142) are still extant. The availability of aerial photographs taken in 1944 means that it has been possible to map the Naval decoy

at Winterton Ness (NHER 29752; see Case Study XXVII below) in greater detail, although it is unlikely that much survives at the site today.

A significant addition to the current record of Norfolk's World War Two decoys has been the identification of two sets of possible dummy coastal guns. These lay at Winterton-on-Sea (NHER 42499) and Hopton-on-Sea (NHER 42484) and each comprised what looks like a pair of large gun houses, similar to those found at coastal batteries, but without the ancillary buildings and defences typically associated with such sites (Fig. 11.10). Although both are sited closer to a genuine coastal battery than the 12,000 yards (10.973km) specified in contemporary guidelines (Dobinson 2000a, 102), this seems the most plausible interpretation of these otherwise enigmatic sites. Both are new additions to the NHER, although the existence of dummy guns at Gorleston-on-Sea (probably referring to the Hopton site) was previously documented elsewhere (Fairhead 1996, i-ii, 44).

#### **Case Study XXVII: Winterton Ness (Fig. 11.11)**

Winterton Ness (NHER 29752) was one of two Naval QL and SF ('Starfish') decoys for Great Yarmouth; the second was at Lound in Suffolk. It employed night-time lights to mimic an ineffective blackout (the QL component) and a variety of flammable devices to represent fires started by bombs (the Starfish component). On Figure 11.11 the Starfish devices can be seen clustered in groups, surrounded by firebreak trenches. Small circular structures and pits, arranged in lines or pairs, probably mark the location of the QL lights. The layout could have been designed to imitate part of Great Yarmouth's urban railway network, as was the case at other Naval decoys (Dobinson 2000f, 143, fig. 32).

#### **11.3.4 ROC Posts**

In addition to the early warning of approaching aircraft supplied by radar (Section 11.3.5), Norfolk's network of Royal Observer Corps (ROC) posts provided visual detection of enemy planes. Although a significant proportion of the county's ROC posts were located within the Coastal Zone (Catford 1999, fig. 2), only four were mapped by the NMP as most were of Cold War date and therefore outside the scope of the project. Three of those mapped were of brick or concrete construction, while Ingham Mill (NHER 8247) made use of a former tower mill as well as a range of huts and other buildings. It is possible that less substantial World War Two posts, which were often built simply of sandbags (Lowry 1996, 32), may not have been recognised. Other than Ingham Mill, the only site to be identified with any certainty - post T/4 of No. 16 Group (Norwich) Observer Corps - lay at West Caister (NHER 35403). It was constructed from railway sleepers and opened in 1934. By 1944, when the earliest available aerial photographs were taken, it consisted of two small rectangular structures. Two successive Cold War posts were subsequently built at the site.

### 11.3.5 Radar Stations and Other Radio-Related Sites

Due to its long coastline and easterly position close to northwest Europe, Norfolk was home to a wide variety of radio-related military installations (Fig. 11.12). Of these, it is the radar stations that have received the most attention from the archaeological community, but other sites used for air traffic control and navigation, eavesdropping and sabotage, were also encountered by the NMP. Although these different types of site are not necessarily related, and were often operated by different services, they are discussed together here due to their shared technological nature. It is notable that a proportion of these sites remained in use in the post-war period, in some cases becoming important Cold War monuments.

The authors are particularly grateful to Roger J.C. Thomas, Military Support Officer at English Heritage, who identified, and explained the workings of, many of the sites described below.

#### *Radar*

Of the documented radar stations mapped by the Norfolk NMP in the Coastal Zone, none formed part of the pre-war Chain Home (CH) network, and they were all therefore established during the war years. The county's only Chain Home Low (CHL) station at Happisburgh (NHER 14147) was operational from Christmas Day 1939. CHL sites supplemented the CH network, providing cover against low-flying aircraft. Happisburgh was an emergency station sited to protect the Wold Channel (Dobinson 2000c, 56). From early 1941 it was joined by Coast Defence/Chain Home Low (CD/CHL) stations at Trimingham (NHER 6799), Winterton (also known as Blood Hill, NHER 35862), Barrow Common (Brancaster, NHER 31786), Bard Hill (Salthouse, NHER 23386), and Hunstanton (NHER 26938) (Fig. 11.12). These too were low-cover sites, established to monitor enemy shipping and initially controlled by the Army. All except Hunstanton were later incorporated into a unified low-cover network with a Triple-Service role, under RAF control. Trimingham, Winterton and Barrow Common were converted to Chain Home Extra Low (CHEL) stations in the middle years of the war and upgraded with more powerful equipment (Dobinson 2000c, 130, table xiii).

At some stations, the availability of wartime aerial photographs dating from a number of different years has allowed the various changes which took place at these complex sites to be mapped and recorded in great detail (see Case Study XXVIII below). Conversely, nothing relating to the station at Hunstanton was recorded by the NMP. This is probably because it was redundant by the end of December 1942 (Dobinson 2000c, 131, table xiv), and no photographic coverage for the early years of the war was available. Any features that survived its dismantling may have been mapped as part of Hunstanton emergency coastal battery (NHER 26938), which occupied the same site.

Typical features visible on the aerial photographs of radar stations include towers, masts, and gantries, transmitter/receiver blocks, generator houses, and a variety of operational and

domestic buildings and huts, often encircled by a perimeter fence of barbed wire or similar material. By September 1940 domestic accommodation was to be located  $\frac{1}{2}$  to 1 mile (0.8–1.6km) away from technical sites (Dobinson 2000c, 64). At Winterton, a large domestic site (NHER 42500) is visible approximately 150m to the south of the operational part of the station, although most of the huts are concentrated at a point approximately 850m to the south of the radar tower. The need for defence against airborne attack at radar sites had been recognised even before the war, when CH stations were given priority in the provision of LAA guns (Dobinson 2000c, 54). By 1939 instructions had also been issued for the construction of defences against ground attack. Early in the war, Passive Air Defence (PAD) measures, such as the provision of air raid shelters, were also undertaken at CH and CHL sites (ibid., 63). Gun emplacements, pillboxes, weapons pits and slit trenches are a common feature of the coastal stations listed above.

Some of the radar stations mapped by the NMP had more than one operational role. Happisburgh was one of the first CHL stations to be equipped with Plan Position Indicators (PPI) for Ground Controlled Interception (GCI), used by fighter planes to locate enemy bombers carrying out night raids (Dobinson 2000c, 92). In 1942 it was formally re-designated as a GCI station (ibid., 93). Both Trimmingham and Winterton radar stations were also 'Oboe' sites, housing equipment used by the navigation systems of bombers attacking the continent. Arrangements of curved profile huts, straddled by gantries and protected by blast walls, are evident on photographs of both sites, and also at a dedicated 'Oboe' site at Scratby (NHER 18359). Barrow Common has been suggested as the site of a radar beacon, also used by aircraft for navigation, but there is little evidence to confirm this.

#### *Other Radio-Related Sites*

A variety of other technical installations were encountered in the Coastal Zone, mainly related to radar or radio (Fig. 11.12). Often the precise function of a particular site remains enigmatic; no doubt many were used for communications or similar tasks. A number of Direction Finding (D/F) stations, used for air traffic control and navigation by allied aircraft, were mapped. They are recognisable thanks to the tall superstructure that sits on top of a squat, pillbox-like building; it is likely that sites where the superstructure had been removed before the earliest photographs were taken may have been mistaken for pillboxes or similar defensive structures. Most of those mapped would have formed part of the 'Coastal System' of such sites, which assisted lost aircraft returning to base, helped to plot the location of mayday signals, and may also have played a role in air and sea rescue activities. A High Frequency D/F station at Hemsby (NHER 27341) comprised up to four transmission huts or towers, an unusually high number. It appears to have remained in use at the end of the war, perhaps in case of radar failure, as specified under the Rotor plan (Roger Thomas, English Heritage, pers. comm.).

Wireless telegraphy (W/T) and radio telephony (R/T) stations were also used for air traffic or convoy control. Of the examples that have been mapped by the NMP, two appear to have been Naval W/T stations, located at Gorleston-on-Sea (NHER 42518) and Ormesby St Margaret (NHER 27662). A possible example at Langham (NHER 27774) was probably used for air traffic control at Langham airfield (NHER 1891), which lay 1.7km to its northwest. It is notable that it had four communications towers rather than the masts evident at the two Naval sites.

A number of sites used for eavesdropping on, and interfering with, enemy communications were also identified. At Trimingham a rather enigmatic site (NHER 38934), only visible on aerial photographs taken in 1942, may have been a Royal Navy 'Y' station. These monitored German W/T and R/T transmissions. At least one radio countermeasures station was mapped, at Mundesley (NHER 38977). It comprised a dispersed arrangement of huts enclosed by traverses and, by the end of the war, an array of pencil masts. The installation was used to counter the radio guidance systems of German bombers. Later in the war it acted as a SPLASHER navigational beacon for the USAAF (Brettingham 2006).

#### **Case Study XXVIII: RAF Trimingham (NHER 6799) (Fig. 11.13)**

A radar station was established on the clifftop at Beacon Hill, Trimingham, by late 1941, and remains in use today, albeit in a substantially modified form. It occupied the site of an earlier beacon and telegraph station marked on 18th- and 19th-century maps. It was initially a CD/CHL (M-Series) station, operated by the army, its primary objective being to detect German submarines and low-flying aircraft. It later became a CHEL station, under RAF control, and was also an 'Oboe' station. In the 1950s the site was remodelled as part of the Rotor programme, at which time a large underground bunker was constructed. After closing in the 1960s the site was remodelled again and reopened in the late 1980s. The geodesic dome covering its radar equipment is now a prominent local landmark. It is considered an important Cold War monument (English Heritage 2001).

The availability of aerial photographs from both 1942 and 1946 allows the development of the World War Two site to be documented. For example, the presence of Nissen huts in 1942 reflects the presence of the Army, while a picket post visible on the photographs from 1946 reflects the RAF's takeover of the site. The Type 54 radar tower also visible in 1946 was part of the upgraded equipment installed at CHEL stations. A variety of defences surrounded the station's technical components, including barbed wire, pillboxes, and gun emplacements. Some of the operational buildings were painted with camouflage paint. The photograph illustrated (Fig. 11.13), which was taken in 1949, clearly shows the principal elements of the site. Two small buildings at the foot of the radar tower housed the stand-by set house and latrines for the CHEL transmitter/receiver block. (The latter is the Nissen hut just visible behind them.) Towards the right of the picture, a flat-roofed building facing the camera was

the CD/CHL transmitter/receiver block; its gantry is still visible above it. In front of it is the CD/CHL stand-by set house. In the foreground, a curved or polygonal profile hut, which is surrounded by a blast wall, probably housed the station's 'Oboe' equipment; its accompanying gantry has already been removed.

#### **11.3.6 Airfields and Airstrips**

Norfolk was one of many counties in Eastern England to have a large number of World War Two military airfields. Most of these, however, were located in the central and southern parts of the county, with only five airfields and airstrips being mapped in the Coastal Zone. Two of these, at Docking (NHER 13551) and Langham (NHER 1891), were fully operational airfields. Docking started life as a satellite airfield for nearby Bircham Newton in December 1939 and later developed into a station in its own right (Bowyer 1979, 98). However, it remained as a grass airstrip throughout the war and only groups of airfield buildings and perimeter tracks were mapped by the NMP. Langham opened in 1940, also as a satellite for Bircham Newton, and became an independent station in July 1942. It was put into 'care and maintenance' in November 1942 for expansion and runway construction, and reopened in February 1944 (Bowyer 1979, 138-140). This wartime phase of development meant that the site had concrete runways and perimeter tracks, and extensive groups of airfield buildings. Dispersed camps, probably domestic sites associated with the airfield, were located in Langham village (NHER 27773). The most significant feature of this airfield is the dome trainer, which survives as one of only a few examples in the country (Fig. 11.14). These structures were used for the synthetic training of anti-aircraft gunners, with film of target aircraft projected onto the inside of the dome to be tracked by the trainee with a dummy gun (Francis 1996, 166-171). Another dome trainer was recorded in the Coastal Zone at the military training site at Great Yarmouth racecourse (NHER 27528).

Two temporary airstrips associated with the preparations for Operation Overlord (the allied invasion of mainland Europe in June 1944) were recorded in north Norfolk. The clearest of these was located on Kelling Heath (NHER 23129) and was created as part of a USAAF training exercise, see Case Study XXIX for details. An analogous area of cleared ground was also recorded on Salthouse Heath (NHER 27862) and probably related to a similar training activity.

A small airstrip was recorded at Weybourne associated with the anti-aircraft training camp (NHER 11335). This was used to land pilotless Queen Bee target aircraft. Another airstrip, used by Special Operations Executive (SOE) Lysander aircraft to ferry agents into occupied Europe, is known to have existed at Heigham Holmes (NHER 25538). However, the ephemeral nature of this site and poor aerial photographic coverage meant that it was not recorded by the NMP.

### **11.3.7 Military Training Areas and Camps**

A large number of sites relating to military training have been identified. These range in size and significance from large training camps to small and isolated scatters of trenches. Much of the coastline, in particular golf courses, saltmarsh, holiday villages and heaths, was requisitioned and used both for training purposes and for accommodating troops. Where the aerial photographic coverage spanned the entire war period, evidence of quite rapid growth and change was revealed at many sites, in particular those within a kilometre of a significant military camp. At some sites an increase in activity relating to D-Day preparations can be identified, such as equipment and vehicles being amassed at particular sites, e.g. Caister Hall (NHER 27510), which was located 100m from a holiday camp where troops were stationed (NHER 27511).

There is a concentration of sites relating to military training in the northeastern and eastern parts of the Coastal Zone. This is likely to relate to the greater number of military installations on the east coast and also greater numbers of troops, in particular in the run up to the D-Day embarkations. It must be noted, however, that significantly better aerial photographic coverage existed for these areas of the coast, both in terms of numbers of sorties and, more significantly, spanning a wider date range. This allowed many of the more ephemeral and temporary training sites associated with the early war years, often no longer visible by 1946, to be identified. The sites discussed fall into several distinct categories: training areas, training camps, accommodation camps and prisoner of war camps.

#### *Training Areas*

A total of eighty-seven military training sites were recorded within the Coastal Zone, eighty-one of which were newly identified sites. The character of these training areas varies widely, ranging from discrete clusters of practice trenches or pits, potentially representing one episode of training, to vast and complex training areas stretching for well over a kilometre along the coast. Within the larger spreads of coastal defences and fieldworks, see Section 11.3.1, are more discrete training sites, for example rifle ranges, such as Weybourne (NHER 38578) and Horsey (NHER 42103). (They include some World War One rifle ranges that were re-used, such as West Runton, NHER 38315; see Section 11.2.2.) Many of the larger training areas are associated with, or situated near to, large coastal installations and camps, such as Weybourne Camp (NHER 11335). Significant training areas were also recorded on the large heaths of north Norfolk, such as Roughton, Kelling and Salthouse. The training activities that took place on these heaths appear to have consisted of the repeated and episodic digging of practice trenches and weapons pits. However, on Salthouse Heath, to the immediate south of Bard Hill radar station (NHER 23386), an unusual concentration of gun emplacements is visible. A HAA battery is located on the northern part of the heath (NHER 35554). There is some evidence on the aerial photographs that this site was used for training purposes. The command post had an unusual and temporary appearance and one of the emplacements had

a gun inserted into the pit in June or July 1946. On the heath to the south around twenty individual gun emplacements can be seen; it seems unlikely that all of these positions were in use at the same time. The large number and varying states of construction of these gun emplacements would imply that many had been built as part of military training exercises, rather than for operational air defence. Again, many of the emplacements had guns in 1946, suggesting that training continued here in the post-war period, perhaps associated with Weybourne Camp 2.5km to the northeast.

#### **Case Study XXIX: Kelling Heath Training Area (NHER 23129 & 38424)**

Kelling Heath, located to the southwest of Weybourne Camp (NHER 11335), provides ample evidence of small-scale fieldworks and trench construction (NHER 38424), giving the entire heath a pitted and scarred appearance on 1946 aerial photographs. The World War Two fieldworks sit within an area of World War One training features (Case Study XXII). There are several dense areas of craters and pits, which are not thought to be weapons pits, and these are likely to be the result of repeated shelling and firing practice. One large-scale feature that runs across the southern part of the heath (NHER 23129) has been recorded as relating to a temporary airfield created alongside the railway as part of a one-day, D-Day preparation exercise undertaken by the United States Airforce (Fig. 11.15). It is visible as a cleared strip of vegetation on RAF aerial photographs taken in 1946. A series of ditches and low banks of upcast have been laid across the strip in a criss-cross pattern. These were presumably anti-glider trenches constructed to render the airstrip unusable by any aircraft for the remainder of the war. Military records indicate that a military camp was also located on Kelling Heath (Foot 2004, 12). No evidence of this could be identified on the aerial photographs, but only 1946 images were available and any temporary camps dating to the earlier part of the war may have been removed by this date. A loop of worn track on the western edge of the heath (NHER 38413) could indicate the former site of the camp.

#### *Anti-Aircraft Artillery Training Camps*

Other than tank training sites (see below), the only large training sites recorded were anti-aircraft artillery training sites. The most significant of these were Snettisham Scalp in west Norfolk (NHER 23145), and Weybourne Camp (NHER 11335) and its satellite camp at Stiffkey (NHER 12747), both in north Norfolk. The training camp at Snettisham was originally a RAF camp, later used as a USAAF gunnery school (by the American 8th Air Force and 1st Combat Crew Gunnery Squadron). The remains of two synthetic air-to-air machine gun ranges are visible, one of which is built to an Air Ministry design called a 'turret range' (Roger Thomas, English Heritage, pers. comm.). The site also had a narrow gauge rail along which a moving target ran. A substantial camp, part of which was used as a prisoner of war camp (see below), was located to the immediate south of the training site. The anti-aircraft training camps at Weybourne and Stiffkey appear to have been undertaking slightly different training activities to those at Snettisham and both specialised in practice firing at drone aircraft catapulted over the coast. These sites also provided vital anti-aircraft defence, with ten 40mm



Bofors guns erected at Stiffkey alone (Kent 1988, 190). Both camps continued in use until the 1950s, being used for National Service in the post-war years.

### **Case Study XXX: Weybourne Anti-Aircraft Artillery Training Camp (NHER 11335)**

An anti-aircraft training school was established on the coast at Weybourne in the mid 1930s as a seasonal tented camp for the Territorial Army. In 1936–7 permanent huts and buildings were erected and the camp was eventually occupied permanently during World War Two. The camp, along with a satellite camp at Stiffkey, represented the main live-fire training ranges for AA Command during World War Two. The land surrounding the camp and the coastal strip was heavily defended, with an almost continuous system of gun emplacements, pillboxes, barbed wire obstructions, minefields, road blocks and slit trenches being constructed around the site. A substantial anti-tank ditch was dug around the perimeter of the camp. To the west, at Kelling Hard, this joined with natural waterways, which were widened to act as further obstacles. Shorter sections of anti-tank ditch were also dug along stretches of cliff which were not sufficiently steep to act as a natural impediment to invasion forces (e.g. NHER 32505 to the east of the camp). The degree of fortification around the camp increased as materials and weaponry became available, and by mid-1941 the defences were at their most developed (Foot, 2004, p4), although the aerial photographs do reveal some significant additions made between 1941 and 1946.

The area within the camp evolved and changed rapidly throughout the war. The number of accommodation huts and military buildings present at the site increased dramatically between 1940 and 1941. The aerial photographs reveal several different patterns and phases of activity throughout the camp (Fig. 11.16). The earlier war years are characterised by evidence of repeated and temporary training activities, such as the digging of slit trenches and the construction of multiple circular gun emplacements, often overlapping and cutting into one another. It is possible that these were constructed from sandbags or were of an extremely temporary nature, as a group of camouflaged huts were constructed over some of the emplacements as early as 1941. Prior to World War Two the camp was already fitted with a catapult for launching radio-controlled Queen Bee aircraft over the sea for target practice. A large number of gun emplacements were located along the coastal strip of the training camp. Some were fairly insubstantial and are likely to have been LAA and machine gun emplacements. However six 3.7 inch heavy anti-aircraft gun emplacements are visible on the aerial photographs, two of which were rebuilt to a different specification between 1941 and 1946. A trio of 5.25 inch gun emplacements and a command post were also constructed on the western edge of the site (NHER 32460). Two of these guns appear to have been constructed between 1944 and 1946 and the third may have been added as late as the 1950s. The camp closed in 1959 and the site is now home to a military museum, the Muckleburgh Collection. Part of the collection is housed within one of the post-war additions

to the site; the NMP mapping clearly shows the World War Two anti-tank ditch running through the museum site.

#### *Tank or Armoured Fighting Vehicle (AFV) Training Sites*

Earthworks and structures relating to tank or Armoured Fighting Vehicle (AFV) training sites were identified at five sites (recorded under NHER 26780, 27521, 38547, 38548, 42357 and 43356). Three represent minor tank training components located within much larger coastal training sites (NHER 38548, 27521 and 42357). One site, NHER 43356, differs significantly from the rest, as it is associated with flotilla training activities on Fritton Decoy (NHER 13527).

#### **Case Study XXXI: Titchwell AFV Range (NHER 26780 & NHER 26789)**

The AFV range at Titchwell, on the north Norfolk coast, is visible on aerial photographs taken in 1945. It was sited in an area of coastal marshland. The site consisted of a series of earth-covered structures, target tracks flanked by embankments, a triangular firing position and a small group of military buildings (Fig. 11.17). The main target tracks were located at approximately 500 yards (460m) and 1000 yards (920m) from the front loop of the firing track, which consists of a triangular loop of road. The firing was all to the north, towards the coast, thus ensuring that any missed shots would land in the uninhabited marshes or the sea. The main moving target tracks would have consisted of a narrow gauge rail along which targets were winched, powered by a blockhouse housing the winching mechanism at the end of each rail. These targets were known as 'hornets' and were tank-shaped and constructed from canvas and wood (James, 2006). The target equipment and rails were located behind a protective bank.

The structures associated with the site, such as the blockhouses and observation buildings are visible on the aerial photographs as sub-rectangular mounds and embankments surrounding concrete components. It is possible that the shorter tracks, which radiate out from a single observation structure and are located nearer to the main firing track, may have been for machine gun practice. This would have consisted of flip-up figure targets operated on a pulley system controlled by the end blockhouse, as suggested for similar features recorded at Boyton AFV Range, Suffolk (James, 2006). A small group of structures to the southeast of the firing track are likely to have been operational buildings and accommodation.

The date of establishment for this AFV site is not known, but it is possible that it is quite late, as one of the minor target tracks appears to run through a cleared minefield (NHER 26785). The minefield may have been laid out and then removed relatively early in World War Two. The plan of the site compares well with that of Boyton, which is known to date to early 1943 (Hegarty & Newsome 2005,131) and therefore the Titchwell site may also be of a similar date. The AFV Range at Titchwell closed in 1945 and was one of the last Eastern Command ranges to close, due to it being kept active in the last years of the war to retrain troops for operations in the Far East (Adrian James pers. comm.). The military retained ownership of the

area and a bombing range was in operation immediately to the west during the 1950s (NHER 18076 & 26784).

### *Military Camps*

A recent English Heritage study defines army camps as 'sites used to accommodate large numbers of soldiers under canvas or in temporary or semi-permanent hutting' (Schofield 2006). A total of thirty-one of the NMP's Coastal Zone sites are indexed in the NHER as military camps. Many of these, however, consisted of only small clusters of huts or buildings associated with minor military installations, and therefore should not be discussed here. Other, larger camps were also recorded, many of which were directly associated with important military sites, such as Winterton radar station (NHER 42500) and Langham airfield (NHER 27772-3). The large anti-aircraft training camps at Snettisham Scalp (NHER 23145) and Weybourne (NHER 11335) obviously included considerable amounts of accommodation within and around the site perimeters.

Nine holiday camps were recorded as having been requisitioned for military use. These were all located along the east coast, from Caister to Hopton. However, this distribution may be a product of variations in aerial photographic coverage, as access to early World War Two coverage was limited in west Norfolk and along much of the north coast (see above). Many of these types of sites were returned to non-military recreational use by the time the 1946 RAF coverage was flown. It is therefore possible that similar sites existed away from the east coast but that these were not detectable from the available photography. Of the nine sites known to have been requisitioned, the majority do not show signs of significant construction taking place, suggesting that the existing chalets and buildings, often dating to the 1930s, provided adequate accommodation and operational rooms. However, additional structures such as Nissen huts were built at several sites.

Holiday camp structures were actually removed in the war years at two camps: Seacroft Holiday Camp, Hemsby (NHER 27371) and Hopton Holiday Village (NHER 42486). In the latter case, the removal of chalets appears to coincide with the construction of a coastal battery at this location. Several of the requisitioned holiday camps are associated with coastal training areas, such as Potter's Hopton Beach Camp (NHER 42491) and Golden Sands Camp, also located at Hopton (NHER 42496). At both of these sites practice trenches and weapons pits are visible amongst the chalets and facilities of the camps. The coastal strips beside these sites were also home to numerous barbed wire obstructions and trenches, and it is possible that many of these were erected as part of training exercises as well as for defensive purposes.

In addition to holiday villages, a number of temporary camps were established in parks and areas of open ground, as at Fritton (NHER 43361) for example. This camp is referred to as

Fritton Warren (WO 199/3095) in military records, and was an assault training camp dating from 1944 (Schofield 2006). It is visible on the aerial photographs as a tented camp sited within an area of heath, now the Waveney Forest. A central cluster of buildings is visible on the edge of the site, and numerous additional tents and structures are hidden among the trees on the margins of the heath. Evidence of training activities, in the form of practice trenches, etc., is visible across the site. In July 1944 numerous army trucks are also visible, possibly suggesting that the site was used as part of a D-Day exercise or for amassing troops prior to embarkation. The camp also appears to be associated with a rifle range located on the western edge of the site (NHER 43362).

### *Prisoner of War Camps*

The identification of prisoner of war (PoW) camps from aerial photographs can be problematic, as not all sites were necessarily constructed for this purpose. Existing military sites, Territorial Army camps and country houses were often used, or prisoners were billeted on farms or placed in hostels (Thomas 2003, 8). However, there were four main types of early purpose-built camp: command cages, interrogation centres, transit camps and internment camps (ibid., 5). Internment camps were built to hold civilian aliens detained in this country or captured abroad, whilst the remaining types were intended to hold captured military personnel (ibid.). Early camps often consisted of a mixture of accommodation including pre-existing structures, huts and tents; command cages were often only fenced holding enclosures (ibid.).

Four PoW camps were identified within the Coastal Zone. Two lay in west Norfolk – one at King's Lynn (NHER 38459) and another at Snettisham (HER 23145 & 26618). The two remaining sites were located on the north Coast – a small military camp mapped at Salthouse (NHER 31923) was recorded as having been used as a PoW camp from August 1946 to November 1947 (Fiddian 2003, 245-6) and another small military camp (NHER 27793) located on Cley Eye, which was associated with the Coastal Battery (NHER 24184) to the immediate north, is reputed to also have been used as a PoW camp.

Each PoW camp was given an official number (1–1026), and a discussion of these listed sites is provided in an English Heritage gazetteer (Thomas 2003). However, the Salthouse and Cley sites are not included within the list, indicating that the official list was by no means exhaustive or entirely accurate. The fact that these smaller camps made use of existing military sites, coupled with a definite post-war date for Salthouse site, probably means they were not considered significant enough to receive an official number. After 1944, and particularly following the surrender of Germany in early May 1945, many PoW camps had to cope with a massive increase in numbers of prisoners, which included those returned from Canada and the USA (ibid.). The camps were forced to employ bell tents within existing compounds, convert existing military sites or billet prisoners out. It is therefore possible that many late camps – those established after the surrender, and in particular those that were not

purpose-built – would not have been allocated an official number. It is worth noting that there was nothing visible on the aerial photographs to suggest that the Salthouse and Cley sites were PoW camps, and therefore other late and converted sites may have gone unrecorded within the Coastal Zone.

Even when a PoW camp is known from official military official records at a particular location, the aerial photographic evidence is sometimes inconclusive. A German work camp recorded at Snettisham Scalp RAF camp (NHER 23145), is thought likely to represent the post-war re-use of existing accommodation (Roger Thomas, English Heritage, pers. comm.; Thomas 2003). However, approximately 200m to the southeast of the training camp is a second camp, which appears to be very temporary and basic in its construction (NHER 26618). The aerial photographs reveal the remains of 159 areas of hardstanding, all 5m square, which possibly represent raised tent bases. These were all laid out on a regular grid arrangement and surrounded by a sub-rectangular loop of road. The site appears to have been abandoned by the end of 1944. This site was originally interpreted as a temporary camp for housing personnel who were training during 1944. The possibility of it being a PoW camp was originally dismissed due to the apparent lack of a visible perimeter fence or watchtowers. However, such features were not employed at all PoW sites, particularly in the period when large numbers of prisoners were considered to be of little threat and were being billeted out due to lack of space. It is possible that both the training camp itself and the external camp were used to accommodate prisoners; possibly the smaller camp was only created as a temporary site during the post D-Day increase in prisoner numbers, before additional accommodation was provided or became available within the military camp.

#### **Case Study XXXII: North Lynn Farm (NHER 38459)**

The camp at North Lynn Farm, King's Lynn (Camp No. 280, NHER 38459), was a German working camp (Thomas, 2003). It is the only site within the Coastal Zone which appears to have been purpose-built as a military prisoner internment camp. The available RAF aerial photographs indicate that the camp was constructed between June 1945 and April 1946. The site is now occupied by a chemical works and none of the original buildings appears to remain. The camp was located next to the docks and gas works, the tanks and cylinders of which were camouflaged during the war. There was a well-worn path running from the camp towards the docks and a large dry dock area, but it is not clear whether this is where the prisoners were being put to work or where they were being transported to and from work.

The main body of the camp consisted of five closely spaced and parallel rows of huts, all measuring 11m by 4m (Fig. 11.18). The close spacing of these huts suggests that they housed prisoners rather than guards. To the east of the site were more military huts and buildings. These were less closely spaced and were probably for military personnel. To the northwest of these were three tall structures, the function of which is not immediately obvious

from the aerial photographs. It is possible that they were guard- or watchtowers. Three circular structures were also identified, which are likely to have been water storage tanks. To the north of the prisoners' huts was an ornamental garden consisting of a square parterre. Ornamental knot gardens and formal flower borders are a common feature of internment camps established during the later war years (Thomas 2003, 8) and they often aid the identification of these sites from aerial photographs.

#### **11.3.8 Civil Defence**

It has been observed that locations occupied by World War Two civil defence works, in their widest sense, were far more numerous than those used for any other wartime activity (Dobinson 2000d, 105). It is notable, however, that the record of such sites compiled by the Norfolk NMP is overwhelmingly dominated by air raid shelters. While a few structures which may relate to civil services operating during the war, such as Air Raid Precautions (ARP) posts and ambulance stations, were also recorded, generally too little is visible on the consulted aerial photographs to identify such sites with any confidence. One element of Great Yarmouth's civil defence scheme recognisable from the air was the erection of emergency water supply tanks at various sites around the town. These circular structures, which are visible on aerial photographs taken during 1944, would have provided a supply of water to combat fires started by bombing raids. Passive anti-aircraft defences such as bombing decoys and barrage balloons, which, while protecting the civil population, were under military control, are discussed in Section 11.3.3.

Official plans for defending the civilian population from aerial bombardment began with the formation of the ARP department (part of the Home Office) in 1935. The Munich Crisis of September 1938 was the catalyst for a flurry of activity, including the building of air raid shelters, which continued throughout the first half of the war (Dobinson 2000d, 1). Some of the shelters mapped by the Norfolk NMP, therefore, may pre-date the outbreak of hostilities by a number of months or even years. In all, air raid shelters of World War Two date were mapped or recorded at 357 sites within the Coastal Zone, some representing up to twenty or more individual shelters. A small number of these were located at defensive sites and were presumably used by military personnel. The vast majority were previously unrecorded, and this testifies to the effectiveness of using aerial photographs to locate and characterise this type of site, as predicted by Dobinson (2000d, 107).

#### **Case Study XXXIII: Air Raid Shelters at Great Yarmouth (Fig. 11.19)**

The majority (87%) of the air raid shelters mapped by the project were located in the parish of Great Yarmouth, a distribution which in part reflects the availability of large numbers of low-level photographs for this area taken in the later years of the war. The shelters are generally visible as earthworks, which presumably covered rigid sub-structures, often semi-sunken or trench shelters lined with a variety of materials. A smaller number of surface shelters were also identified, but these are difficult to distinguish from other types of building using aerial

photographs alone. Although their precise form is for the most part obscured by their earth covering, the shelters can be classified into three groups on the basis of size, while their location can indicate which group of people they were intended to protect.

Larger shelters are generally visible singly but sometimes occur in pairs or close to other smaller shelters. Typically two or more revetted entrances are visible, together with probable ventilation shafts on the roof of the shelter. Many of these large shelters were located in the grounds of schools; while they may have been constructed to provide protection for staff and pupils at the school, they could also have acted as communal public shelters. Medium sized shelters are usually visible as elongated mounds, which probably covered a solid sub-structure or lined trench. They occur singly and in groups. In several cases they seem to have been part of an industrial complex where they were presumably provided for workers at the site. Small shelters, usually visible as mounds but also as uncovered surface structures, are mostly found in a domestic context, usually within the back gardens of residential properties. These were private shelters, intended to protect a single family or household. Many were probably Anderson shelters, supplied by the government (via local authorities) to low-income families; Great Yarmouth alone purchased 600 such shelters early in the war (Tooke & Scarles 1989, 13). Occasionally sunken entrances, sometimes protected by anti-blast traverses of earth or some other material, are visible at one end. It is notable that fewer Anderson-type shelters were mapped amongst the closely spaced buildings near the town centre; this may in part reflect a lack of space in which to erect them, and perhaps a greater reliance on public shelters as a consequence, but may also be due to the difficulty of picking out such small structures on the aerial photographs when they are surrounded by buildings and yards.

#### **11.4 Cold War**

Military sites of the Cold War, i.e. dating to the period 1945–1992, lie outside the scope of most NMP projects, and such sites were not mapped within Norfolk's Coastal Zone. This is not to say that aerial photographic analysis and transcription is not of use for this period, or that the mapping and recording of such sites differs greatly from those of the earlier 20th century. Post-war aerial photography, particularly that from the 1950s and '60s, of several of the World War Two sites discussed above, revealed clear evidence of continued use during the Cold War. The archaeological significance and value of some sites, such as the radar station RAF Trimingham (NHER 6799), is arguably more dependent upon their Cold War history and surviving remains, rather than any World War Two activity mapped by the NMP. It is possible that future NMP projects, within Norfolk and elsewhere, may include the mapping (or at least recording) of these more recent military sites.

# 12 Inter-Tidal Sites

## 12.1 Introduction

One of the main objectives of the RCZAS and coastal NMP projects was to provide information on any archaeological remains surviving within the inter-tidal zone. The archaeology of the inter-tidal zone is poorly understood when compared with that of other landscape types, and it was considered important to gain information about what is visible and survives in the present, but also about what had been present in the recent past. The complementary approach of the two survey methods employed (aerial survey and field survey) was intended to inform on both aspects. See Section 3.3 for a discussion of the use of aerial photographs in studying the inter-tidal zone, and Section 12.7 for a comparison of the results of the NMP survey and the ground-based Rapid Coastal Survey within this environment.

The Norfolk NMP has identified 170 sites which are classified as being inter-tidal, 153 of which were previously unrecorded. Almost half (seventy-three) of the inter-tidal sites relate to World War Two coastal defences, such as beach scaffolding, barbed wire and pillboxes, and these are discussed in Section 11.3.1 above. The non-World War Two inter-tidal sites consist of oyster and mussel beds, fish traps, post alignments, jetties, piers, wrecks and sea defences.

The inter-tidal zone in Norfolk is quite diverse and can be sub-divided into several character types, both in terms of the types of environment encountered, and also, more significantly, into areas affected by different coastal processes. These different zones can broadly be placed into two categories: eroding and accreting coastlines, although this division is quite simplistic as much of the Norfolk coast has been subject to both processes throughout its history (see Section 2.4). A third category, that of estuarine environments, can also be identified, although this cannot easily be separated from the two main coastal types, as many of Norfolk's estuaries have seen extensive episodes of scouring, silting and accretion. As discussed in Section 3.3 these various coastal processes have had a dramatic effect on the visibility and survival of archaeological sites.

## 12.2 Accreting Coastlines

There are two significant areas of accretion on the Norfolk coast. The north coast between Hunstanton and Weybourne is characterised by a sandy barrier and tidal marsh, with sandspits and barrier islands located seaward of a complex system of tidal channels, mudflats and saltmarshes. (The formation of major sandspits in this area is discussed in Section 2.4.2.) The east coast between Happisburgh and Great Yarmouth also comprises a system of dunes.



As discussed in Section 2.4, the area of tidal creeks and mudflats beyond Breydon Water no longer exists due to the development of a large sandspit, on top of which Great Yarmouth now sits, combined with natural silting of the channels. This has resulted in the character of the former estuary and marshes being permanently altered, and large parts of this area are now completely cut off from any tidal influence.

Accretion in these areas is likely to have covered the remains of formerly inter-tidal sites, similar to those identified within the older inter-tidal areas of the north coast. Although a number of inter-tidal sites were identified around Breydon Water (Section 12.6 below), these are likely to represent a small percentage of those originally present. Unsurprisingly, all of the sites visible within the modern inter-tidal areas of Breydon Water are probably post medieval in date. It can be assumed that any sites relating to earlier inter-tidal areas, such as that in existence in the Roman period, must be located further inland, on the margins of the former estuary, and are likely to be heavily masked by alluvial deposits. The accretion and silting of estuaries and saltmarshes as a result of land reclamation is discussed in Section 10.7.

### **12.3 Eroding Coastlines**

The use of historic aerial photographs provides a valuable opportunity to record sites that have been lost to erosion since the date of the photography. There are rare traces visible on the aerial photographs of prehistoric sites, such as 'Seahenge' (see below), which were originally some distance from the sea but are now exposed on the coast. These sorts of inter-tidal sites are generally not visible or easily identifiable on the aerial photographs and are more readily identified from coastal field survey. However when arable land is located near to eroding coastline it is possible to record some prehistoric sites prior to their destruction using historic aerial photographs. In Happisburgh the edge of a field system and enclosure complex of Iron Age to Roman date is currently being lost to erosion (NHER 16015). At Sidestrland the location of a possible Bronze Age barrow (NHER 38880), mapped from aerial photographs from 1955, is now located on the cliff edge and could already have been lost to erosion.

The rapid erosion of the unconsolidated cliffs and dunes of northeast Norfolk has resulted in many post medieval sites and 20th century military remains now being recorded in the inter-tidal zone that were once located on clifftops, or even set back from the cliff edge by over 100m in some cases. The mapping of World War Two military defences clearly illustrates the rate of erosion since this period to the modern day, with many of the defences once situated on cliff edges and dunes now located on tidal sands or completely lost to the sea. This process could be identified as early as 1953, when the RAF 'Floodlight' series of aerial photographs were taken: many clifftop defences were already located in the inter-tidal zone by that date. Although obviously exacerbated by the 1953 East Coast Floods, this was also a result of the continual crumbling of the coastline in this area.

The areas where erosion is most severe often coincide with areas which were heavily defended during World War Two. The relatively low, unconsolidated cliffs of the northeast coast, which were felt to be vulnerable to attack, were often intensively mined and trenched, undermining clifftops that were already unstable. Cliff-falls and the general instability of this coastline meant that the systematic removal of World War Two mines was impractical. The erosion of cliffs during the war also meant that plans produced of minefields when they were laid were no longer an accurate guide to their position. At Trimingham, where the cliffs have receded over 100m since the 1940s, the beach was not opened to the public until 1966, when its minefield was finally cleared (Bird 1999, 56). Even on the harder Red Chalk cliffs of the west coast at Hunstanton, World War Two defences threatened the integrity of the cliffs. The 6 inch gun emplacements belonging to the emergency coastal battery (NHER 26938) were only fired twice, nearly causing the cliffs to collapse. These had been dug into extensively to provide chambers and tunnels for storing ammunition and guns and for housing personnel. The guns were not fired again.

#### **12.4 Exposed Peats and Clays on the North and Northeast Coast**

As discussed in Section 2.4.1, the erosion of north and northeast Norfolk is exposing a variety of intercalated clays and peats in the inter-tidal zone. These relate to former freshwater and fen and estuarine environments that previously lay further inland or were protected by dune formations. The erosion of dunes, often combined with the scouring of beach material during storms, has resulted in a series of structures and land surfaces being exposed within the inter-tidal zone. The processes that caused two Bronze Age timber circles, which lie within peat deposits, to be exposed on the beach at Holme-next-the-Sea have been outlined in Section 2.4.1. It is important to note that neither of these now inter-tidal features were clearly visible on the consulted aerial photographs, other than those taken specifically of the excavation or with prior knowledge of the site. Previously exposed areas of peats on this part of the coast could be tentatively identified on historic aerial photographs, and initially these areas were mapped by the NMP, as such information could aid our understanding of past exposures. However, this mapping was only undertaken systematically within the northern SCC pilot area in northwest Norfolk (covering Hunstanton to Burnham Market).

#### **Case Study XXXIV: Sea Palling and Lessingham**

In the past, areas of exposed peats and clays were frequently recorded on the northeast coast, in particular around Lessingham and Sea Palling (Section 2.4.1). However, since the construction by the Environment Agency of offshore rubble reefs along this stretch of coast in 1994, the resulting accretion of beach material has covered these previously exposed deposits (Murphy 2005b). Therefore aerial photographs taken prior to this intervention now provide one of the only opportunities to investigate these exposures. In 1978–80 large areas of peats and clays and also structures were exposed (*ibid.*), and it is therefore unsurprising that extensive deposits were still visible in 1981 (when they were captured by Ordnance

Survey vertical photography), measuring 650m long and up to 60m across (NHER 27322). Investigations of peat deposits further to the west have indicated an Early Neolithic basal date, with the peat continuing to form into the Bronze Age (Murphy 2005b). A Middle Bronze Age rapier was found embedded in peat layers exposed on Sea Palling beach (NHER 34508). Although no significant structures were identified on the aerial photographs, a number of possible linear features, up to 14m long, were visible (NHER 27322). The physical structure of all of these features is uncertain, although it is possible that they were of wooden construction. Some could be the remains of earlier groynes. A few other possible linear features were identified, but the deposits have been exposed and peeled back into bands by the sea, creating some linear and angular edges and lines which may be natural in origin. However, one angular edge was identified that seemed more sharply defined and rectilinear than the others, and it was therefore felt that this could relate to an archaeological deposit. Linear ditches of possible Iron Age to Roman date have been recorded within other exposures at Sea Palling (NHER 32093) (Pestell 1993, 13) and it is possible that the linear features visible on the aerial photographs of Sea Palling beach (NHER 27322) represent similar features.

The Lessingham to Sea Palling stretch of coast is the location of a major archaeological site exposed on the beach by erosion and dune recession: the medieval village of Eccles-next-the-Sea (NHER 8347), including its church (NHER 8346). The settlement was traditionally recorded as having been destroyed by the sea in 1601 or 1604 (Pestell 1990; Pestell 1993, 1). The remains became encased in dune formations, until the 19th century when the tower of St Mary's Church emerged from the retreating sand dunes (*ibid.*) (Fig. 2.3). The tower finally collapsed during a storm in 1895. In 1908 a series of probable wattle-lined wells or refuse pits (NHER 8347) of medieval date were exposed (Pestell 1993, 14). During the late 1980s and early 1990s, the beach suffered severe scouring, exposing many more components of the church and village. This has been attributed to a general increase in erosion, which meant that the beach was no longer able to recharge itself rapidly enough to stop the underlying clays being exposed to the action of the sea (*ibid.*). The remains of the church tower's foundations, walls, roadways and a large spread of masonry rubble were exposed. A series of wells, postholes and pits were also uncovered. The exposed remains of many of these features are visible on aerial photographs, in particular those taken after the major scouring events of 1953 (the East Coast Floods) and 1991. However the aerial photographs do not show the full extent of the archaeological features recorded during the archaeological survey of the beach, which were spread over 150m along the coast and approximately 35m out towards the sea. The features mapped by the NMP covered only a 100m strip, centred on the church ruins, and were mainly located within 25m of the sea wall.

The NMP mapping offered little new information about the site, other than a transcription of some features previously only located in relation to the sea wall, onto a 1:10,000 map base.

Although a number of new possible linear features were identified, it is not clear whether these represent structures projecting from the surface or the edges peat and clay strata. An additional area of exposed stonework or a concrete structure (NHER 27325) was also identified on aerial photographs within the area of the medieval site. The feature was visible shortly after the 1953 storm event and may have been exposed by storm scour, although it could equally be recently deposited debris from the flood. The structure or feature is not clear enough to make a definite interpretation and it is not possible to deduce whether it was part of the medieval settlement. It is possible, given the number of World War Two defences recorded in the area – many of which were dug into the dunes and sea walls – that the rectangular structure could be part of a previously covered military defence.

## **12.5 Estuarine Locations**

The estuarine areas of the Norfolk coast represent one of the most challenging environments in terms of identifying archaeological sites from aerial photographs. This is partly due to the lack of suitable aerial photographs (see Section 3.3), but also relates to the types of archaeology encountered. The ever-changing interface between dry land, marsh and water makes the rectification of photographs awkward, as there are few reliable control points. More significantly, sites and deposits are only exposed periodically. Only the estuaries of the north Norfolk coast still represent significantly dynamic and tidally influenced landscapes, although as discussed in Section 2.4 many of these are substantially reduced in their size, extent and tidal influx. The drainage and reclamation of the former estuaries of the Wash and Breydon Water has resulted in a much more stabilised environment. The north Coast, by contrast, is still subject to shift patterns of sediment and scour. The fact that inter-tidal structures known to have been constructed since the Second World War are now completely obscured by sediment (John Wright, pers. comm.) is a good indication of how rapid the rate of deposition can be in these channels.

## **12.6 Archaeological Sites of the Inter-Tidal Zone**

Most of the archaeological sites already discussed were originally on dry land, but have since eroded into the inter-tidal zone. By contrast, a proportion of the sites mapped by the NMP originated in this liminal environment, and are by their nature inter-tidal. These are discussed below, classified into several different site-types. For the most part, these sites were only recorded in significant numbers within estuarine environments, but those few identified in other coastal landscapes are also discussed below.

### **12.6.1 Fish Traps**

A number of possible fish traps were identified within the estuaries and on exposed sections of beach at Holme-next-the-Sea. However, nothing was mapped of comparable magnitude to the Holbrook Bay fish trap recorded in the Stour estuary by the Suffolk Coastal NMP. This was a V-shaped arrangement of posts, measuring over 300m in length (Hegarty & Newsome 2005, 61).

A 30m long alignment consisting of nine posts (NHER 38209) was identified on the beach at Holme-next-the-Sea. Some of these posts have since been recorded during monitoring and a walk-over survey of the beach (Robertson 2005). The date and function of the post alignment is still unknown; samples recovered proved unsuitable for dating. It is possible that the posts represent the remains of a fish trap, fence or trackway. A similar alignment of thirteen posts (NHER 38043), running intermittently for 30m, located approximately 500m to the east, has been dated to the Early to Middle Saxon period (Brennand & Taylor 2003) and is thought to be the remains of a fish trap. A more complete example, following the same alignment, was located 50m to the south and has been dated to the Middle Saxon period (NHER 38042). This consisted of V-shaped alignment of 102 vertically set posts, evident intermittently for 30m. A number of other fish traps were also identified nearby by ground survey (NHER 37613, 39586 & 38222). It is possible that all of the intermittent post alignments on the beach are fish traps and potentially also of Saxon date, due to the similarity of location and construction. However, it is worth noting that the alignment of nine posts initially discussed (NHER 38209) is arranged perpendicular to the coastline and therefore could be the remains of a sea defence or groyne, although one arm of the Middle Saxon V-shaped fish trap follows a similar alignment. A number of other undated linear features, possibly post alignments, were identified within the estuaries, such as NHER 26971–2 located within the Stiffkey Meals, and these may be the remains of fish traps.

A series of seven small, submerged V- and L-shaped linear features was identified (Fig. 12.1) within Blakeney Harbour channel on Environment Agency photographs taken in 2002 (NHER 38487–90). As the structures were only partially visible through the water, it was hard to discern their construction method and material. It is possible that they are post-built, perhaps incorporating wattle, or that they comprise low flint cobble walls; other inter-tidal structures identified within this section of channel were constructed using the latter material (NHER 27739, Section 12.6.2). The arms of the structures vary in length from 23m to 73m. The V-shape of these submerged structures is reminiscent of the Saxon fish traps at Holme and Holbrook, and of others such as the Sales Point fish trap from Essex (Strachan 1997). At the same time, and although on a much smaller scale, the structures are also similar in plan to the 'kiddles' (a type of fish trap) recorded in the River Deben by the Suffolk Coastal NMP (Hegarty & Newsome 2005, 105-6). This complex of immense V-shaped arrangements of posts would probably have had nets slung between them. The Suffolk kiddles are undated, but are similar to examples recorded in Essex that range in date from the medieval period to the 20th century (Strachan 1995, 31). A late, probably post medieval, date is more realistic for the Norfolk structures, due to their location within Blakeney Harbour channel. As mentioned in Section 2.4.2, this channel is known to have altered significantly during the last few centuries, lengthening and shifting almost 3km to the west since the late 16th century (Hooton 1996, 13-22), taking in the location of the structures. These changes were caused by the shifting formation of a large shingle spit to the north, plus a reduced tidal discharge and

scour caused by the reclamation of the surrounding saltmarsh. It is also feasible, however, that the movement of the channel has uncovered earlier inter-tidal sites that had been covered by sand accretion.

### **12.6.2 Shellfish Beds**

A total of thirty-three shellfish beds have been recorded within the Coastal Zone. These were found in a variety of contexts, but mainly along the edges of estuaries and on the margins of the saltmarsh. The pits were used for the fattening of shellfish, such as oysters and mussels, which had been dredged from the estuaries or, during later periods, imported (Cushion 1999). Documentary evidence for shellfish production in Norfolk is limited. In the 1440s, a court record referred to the Lord of the Manor of Burnham taking proceedings against two men who had taken oysters from the saltmarshes without permission (Ringwood n.d., after Rye 1873). As early as the Elizabethan period, the problem of overfishing of oysters was mentioned in relation to the region (Cushion 1999, 349). The medieval oyster industry is well documented in Essex, but most of the known evidence for the Norfolk industry dates to the post medieval period.

The majority of shellfish beds visible on aerial photographs are likely to be post medieval in date, although some earlier and possibly medieval examples have tentatively been identified (see below). The characteristics of the sites vary, although the majority of the beds were roughly rectangular or sub-rectangular in shape, ranging from 5m to 20m across. Several morphological and historical patterns can possibly be observed. These can be illustrated by two different groups of shellfish beds at Burnham Overy (Fig. 12.2). As mentioned above, the exploitation of oysters is referred to as early as the 15th century in the Burnhams. The oyster and mussel industry at Burnham Overy continued into the later 19th and early 20th century, when the shellfish grounds were spoilt by the influx of sand.

Located out in the channel at Overy Cockle Strand are a series of sub-rectangular and irregularly shaped pits (NHER 26660), all linked to the main channel by narrow drains or leats. Some of the pits are rectangular, generally 3–5m across, and appear to be conjoined with or cut into one another. The less regular pits are more elongated in shape, ranging from 1m to 10m across. None of the more irregularly shaped pits reveals evidence of inter-cutting or phasing. All of these pits are linked to a large channel to the north, either directly or by a subsidiary channel. This northern channel appears in places to have been cut into a rectangular shape, measuring approximately 7m by 25m. To the west of this linear group are several pits, which are linked by separate, meandering channels to the main body of the creek. The site sits on the southern edge of a creek coming off the Overy Cockle Strand. Tidal waters would presumably have filled this area of the channel at particular times of the day. The date of these shellfish beds is not known; the irregular shapes and the recutting of the pits could indicate use over a considerable length of time. The pits are located on the

seaward side of a sea defence bank of 1822 (NHER 26666). It could therefore be argued that these pits post-date 1822, although they follow the line of a channel that may pre-date the sea bank. The post medieval oyster industry at Burnham Overy is well documented and in a petition of 1646 the fishermen complain that the enclosure of the saltmarshes (see Case Study XVII) has resulted in the 'stopping up [of] their havens so that their boats could not come up to their houses, whereby they were compelled to carry oysters on their backs' (Moore 1967, 15-6). This suggests that the early oyster beds were located out in the channels, and these are likely to be represented by the earthworks visible on the aerial photographs.

A group of later 19th-century shellfish beds (NHER 27019), also mapped at Burnham Overy, are much more regular and rectangular than the examples sited out in the channel (Fig. 12.2). These clearly match up with the beds marked on the 1825 Burnham Overy Enclosure Map. The pits are noticeably more rectangular and nucleated. The varied morphology of the two sites may indicate that the irregular pits out in the channel represent medieval or earlier post medieval oyster beds, while the more regular and rectangular beds represent later constructions. The later beds at Burnham Overy are labelled 'mussel beds' on the 1902–7 Ordnance Survey 2nd edition 25 inch map. The pits are depicted as being surrounded by a series of posts, also in the channel, and these are likely to have provided structures for the mussels to anchor to. The mussel industry in northwest Norfolk is recorded as being more reliable and constant than the exploitation of oysters, although oyster beds are recorded as being present at Burnham Overy Staithe and Brancaster to the west (e.g. NHER 26767) in 1895 (Cushion & Davison 2003, 194). This suggests that the post medieval shellfish pits mapped on the north coast were predominantly used for mussels, with oysters being farmed more occasionally when the stocks and the market made it worthwhile. The fattening of oysters at Burnham and Brancaster appears to have coincided with the decay and temporary closure of the oyster and mussel beds at King's Lynn (Cushion & Davison 2003, 194) and this may have increased demand at other sites on the Norfolk coast.

Four probable shellfish pits or oyster beds were identified on the edges of Breydon Water. Three of these sites (NHER 27634, 42169–70) consisted of sub-rectangular pits comparable with other examples in Norfolk, such as those at Heacham (NHER 1460–2) and the Burnham Overy examples. However, one possible group (NHER 27586) differed in morphology, consisting of a closely spaced arrangement of interlinked elongated pits, up to 17m long (Fig. 12.3). It is possible that rather than representing shellfish beds these elongated cuttings are the result of extraction, possibly for clay or turf. The shape of the earthworks is very similar to earthworks recorded in the Broads Zone that have been interpreted as post medieval turf ponds and cuttings. There are inherent problems associated with the identification of shellfish pits in the absence of documentary or map evidence. Some groups of sub-rectangular pits cut into the marshes alongside post medieval sea defence banks are likely to be borrow pits,

excavated to provide material to maintain and repair the sea defences. A similar problem with identification was highlighted by the Suffolk Coastal NMP (Hegarty & Newsome 2005, 92).

A large area of post medieval to modern mussel beds (NHER 27739) was also identified within Blakeney Harbour channel (Fig. 12.1). Some may still be in active use. The morphology of these sites contrasts with the other shellfish beds described above. The main component of the group is a large trapezoidal mussel bed, measuring 58m by 50.5m and 67m on the diagonal. The structure consists of low walls constructed from narrow lines of flint cobbles (c. 4-6 inches [100–150mm] in diameter), which are mostly clean on their undersides (John Wright pers. comm.). A number of causeways in the sides of the enclosure are clearly visible. It is possible that these gaps are due to later damage to the structure, but they are more likely to be part of the original design, presumably included to allow water movement through the enclosure. A further submerged rectilinear enclosure is also visible; this appears to be connected to the larger structure by a series of linear features.

#### **Case Study XXXV: Oyster Beds at Heacham**

A dispersed group of oyster beds was recorded from aerial photographs along 2km of the coast at Heacham (NHER 1460–2). Aerial photographs from 1946 and 1953 show two main areas of earthworks, a northern group (NHER 1460) and a southern complex (NHER 1461–2), with only the northern earthworks now surviving on the ground (Fig. 12.4). These rectangular pond-like earthworks had originally been interpreted as extant salt pans or salterns (NHER 1460). An earthwork survey by Brian Cushion in 1998 re-interpreted the surviving earthworks as oyster beds (Cushion 1999).

The northern group (NHER 1460) lies in an area of former saltmarsh, which has now been turned over to rough grazing. The site is situated to the immediate west of a former tidal creek, which fed the pits via a series of leats. The site consists of at least sixty-seven separate pits or beds. The beds themselves are broadly rectangular in shape, varying from 8m to 21m long and between 3.5m and 7.5m wide. In the southern and central area of the site the pits are extremely well preserved and are surrounded by low banks, up to 4m wide. There are three main dendritic arrangements of beds and channels and these appear to be fed by leats coming off a tidal creek as described above. There are also two linear arrangements of pits that are connected to a drainage ditch by individual leats. The drain defines the southern extent of the earthworks.

The beds are separated from the coast by a sea defence bank, recorded as 'new' on the 1781 Enclosure Award Map, which cuts across the southern end of the tidal channel. The straight southern drainage channel appears on an 1820 estate map, suggesting that the pits or beds were in existence by at least that date (Cushion & Davison 2003, 194). This drain is not depicted on the 1781 Enclosure Map, which could indicate a date of between 1781 and 1820



for part of the site. However, the morphology of the site as a whole would suggest that the more dendritic and sinuous channels represent an earlier phase (Cushion 1999, 350), which was adapted from tidal creeks, the straight drains and linear arrangements of pits being a later addition.

Documentary research has revealed references to oyster fattening grounds at Heacham Harbour in 1875 (Cushion 1999). This would broadly fit with the second phase of the northern group of beds at Heacham. 1.5km to the south are two further areas of oyster beds (NHER 1461–2), which are visible on aerial photographs taken in 1953, shortly after the East Coast Floods. On these the beds show either as banks projecting out from the submerged land surface, or as pools of standing water where the surrounding area has drained. The plan of these beds would suggest that they too developed from natural tidal creeks, as the channels are sinuous and dendritic in plan, and again this may suggest a relatively early date. These two sites are now lost under caravan parks and other development.

### **12.6.3 Piers, Jetties and Post-Built Structures**

A total of twenty-one jetties, piers and wooden post-built structures were identified within the inter-tidal zone, the majority of which were situated within estuarine and saltmarsh environments. A number of former jetties and moorings were identified, all probably of post medieval date and of varying archaeological significance. A group of jetties and post-built quayside structures are visible on aerial photographs near the mouth of Great Yarmouth harbour (NHER 42376) (Fig. 12.5). The posts are arranged in linear sections, often formed by a double row. These post alignments run from the South Denes out into the harbour and are likely to represent former jetties or similar structures. It is also possible that some of the structures acted as breakwaters. Along the eastern edge of the South Denes is an area of rectilinear arrangements of posts and it is likely that these are the remains of a former quayside structure.

Eleven post alignments or post-built structures were identified within the inter-tidal zone. Some are likely to be the remains of former groynes, such as NHER 27332, but others may represent more significant structures. A group of four lines of parallel timber posts (NHER 39162) was identified to the east of Cromer Pier. Although again it is possible that this is the remains of a groyne, it may relate to the pier of 1732 or even the western arm of jetty dating to 1591, both of which are thought to have been aligned with the northern end of Jetty Street (Harbord 2001, 3-4). A similar arrangement of posts is located to the east of this site, between the East Groyne and the present pier; this is thought to be part of the 1846 pier (NHER 39168).

A number of timber post alignments were identified on the aerial photographs in the Breydon Water area (NHER 41616, 41620, 41635 & 42220). Many of these sites have been visited on

the ground and are thought to be the remains of revetments. The remains of a circular or D-shaped post-built structure were identified within estuarine mud at Breydon Water during the Norfolk Rapid Coastal Survey (NHER 41618). This was interpreted as a possible fish garth, a type of tank used by fishermen to temporarily hold catches (Robertson et al. 2005). Other posts were thought to have been part of a jetty or walkway. This garth was visible on the aerial photographs, which also revealed that some of the posts recorded on the ground were the remains of a fisherman's hut of probable 20th-century date.

#### **12.6.4 Wrecks**

A total of fifty-five wrecks have been recorded as part of the NMP mapping. The majority of these were located in the inter-tidal zone or within shallow coastal waters. Very few of these vessels could be matched up with existing NMR and NHER records for lost shipping, partly due to the inaccuracy of the grid references provided for most records. Nineteen wrecks were located within the estuarine area of Breydon Water. These tended to be 19th- or 20th-century vessels and were located on the edge of former channels. These crafts would probably have been associated with river transport of cargoes and goods and are likely to include wherries, keels or barges. One group of wrecks (NHER 27637) identified on the southern edge of Breydon Water, together with another wreck located 20m to the northeast (NHER 41624), may collectively represent a ships' graveyard, where unwanted vessels were abandoned out of the way of the main river channel.

A number of these wrecks mapped in the Coastal Zone can be dated to World War Two. The HMS Dungeness, an Admiralty trawler (NHER 34156), was run aground at Happisburgh on 15th November 1940, after being attacked by an enemy aircraft. Some vessels were deliberately sunk to be used as bombing targets, such as the landing-craft or barge sunk in 1947 at Breast Sand, Terrington St Clement (NHER 34152). The wreck of the Vena, located on the tip of Scolt Head Island (NHER 15531), was originally intended as a blocking ship for Great Yarmouth harbour, but was instead towed to Brancaster and used for target practice. A group of ex-military vessels, possibly landing-craft or barges, was incorporated into a revetment on the southern bank of the West Lynn Drain, approximately 100m from its outfall into the River Great Ouse (NHER 38309). The vessels ranged in length from 17m to 28m, and were arranged along the edges of a three-sided recess within the southern bank of the drain. There appears to have been an east-to-west aligned bank built over and partially covering one of the vessels. The boats were almost certainly deliberately positioned to act as a revetment. This three-sided shape within the bank is still retained to the present day, although the vessels appear to have been covered with soil and vegetation.

## **12.7 NMP Inter-Tidal Results and Comparison with RCZAS Field Survey Results**

### **12.7.1 NMP and Inter-Tidal Archaeology**

When the extent of the Norfolk coast is taken into consideration, there is a relatively low incidence of pre-World War Two inter-tidal structures that have been identified from aerial photographs. This is due in part to such structures being obscured by layers of silt and sand, and being partially submerged even at low tide. As has been outlined in Sections 3.3 and 12.3, even known archaeological sites within the inter-tidal zone, such as the Bronze Age timber circles at Holme-next-the-Sea, were not visible on the aerial photographs consulted by the NMP, other than those taken specifically of the 'Seahenge' excavation. This indicates that important and vulnerable structures, such as 'Seahenge', are not necessarily identified by the standard NMP methodology. The value of a multi-disciplinary approach, like that employed by the RCZAS, was demonstrated at Holme by the systematic monitoring of the beach by Norfolk Archaeological Unit. This ground-based work, which was funded by English Heritage, revealed many additional exposed structures, such as fish traps with remains of wattling, which can be dated to the Saxon period (NHER 37613, 38042, 39586 & 38222). Small wooden structures such as these, which project from peat deposits, are extremely hard to identify from the air, more so than those located on silts and sands; they prove a particular challenge for aerial photographers (Damian Grady, English Heritage, pers. comm.).

A relatively low rate of pre-World War Two inter-tidal sites was also a characteristic of the Suffolk Coastal NMP results (Newsome & Hegarty 2004, 13-19; Hegarty & Newsome 2005, 17-18), and the poor inter-tidal visibility in both counties contrasts with the more productive Essex estuaries (Strachan 1995, 34-35). Strachan's presentation of the exceptional inter-tidal results achieved by aerial photography in Essex, led to a suggestion that similar aerial reconnaissance and mapping elsewhere in southeast England could generate comparable levels of inter-tidal discoveries. However, it is likely that the high number of sites in Essex is reflective of the fact that the county has much wider and shallower estuaries than most of Suffolk and nearly all of Norfolk. The Essex estuaries also tend to have a high tidal range, and although parts of the Norfolk coast have a comparable range this does not appear to extend to the estuaries. The north Norfolk coast has seen considerable silting of its major channels and estuaries, and therefore much evidence for estuarine exploitation is probably obscured by alluvium. The development of the Blakeney Spit has deflected and constricted the former estuary of the River Glaven (see Section 2.4.2), thereby significantly reducing the tidal range. The development of the Great Yarmouth sandspit had a similar but even more dramatic effect, reducing an immense estuarine landscape – the main part of which covered approximately 12km by 6km – to the 5km long, narrow body of water known today as Breydon Water. This widespread silting means that Norfolk, unlike Suffolk and Essex, is not now extensively indented by estuaries and therefore many former inter-tidal areas are today deeply buried beneath later sediments. It is also possible that Norfolk's estuaries were

exploited in a different manner to those in Essex, and that the large-scale fish traps and kiddles identified in Essex, and to a lesser extent Suffolk, never existed within the Norfolk estuaries.

It is possible that the relative paucity of inter-tidal sites in Norfolk and Suffolk also demonstrates the unsuitability of standard NMP aerial photographic sources for investigating dynamic coastal environments. It is likely to reflect a lack of targeted inter-tidal archaeological reconnaissance prior to the Coastal NMP projects starting. It is interesting to note that Essex, where numerous inter-tidal structures have been identified from the air, also has a long history of reconnaissance in these environments, a field pioneered by Davey Strachan (Damian Grady, English Heritage, pers. comm.). Norfolk has no comparable aerial photographic data, despite extensive aerial reconnaissance having taken place in the county. The potential for new discoveries to be made through the targeting of inter-tidal environments is suggested by the identification of post medieval and modern mussel beds in Blakeney Channel (Section 12.6.2 & Fig. 12.1) during inter-tidal reconnaissance undertaken by Damian Grady of English Heritage. Admittedly these sites are not of comparable archaeological significance to the Saxon fish trap recorded in the Stour Estuary by the Suffolk Coastal NMP (Section 12.6.1; Hegarty & Newsome 2005, 61-63); they do, however, indicate that new inter-tidal sites, previously unrecorded and, more significantly, not identified on the ground during the RCZAS field survey (see below), can be located through targeted inter-tidal reconnaissance. Whilst it is unlikely that the Norfolk and Suffolk inter-tidal zones will ever yield results comparable to those from Essex, it has become increasingly clear that to locate inter-tidal sites, specific and targeted aerial reconnaissance is needed. This needs to be undertaken at the right time of the year, and needs to take the tides into consideration, in particular taking advantage of low tides in spring and autumn.

### **12.7.2 Comparison of NMP and RCZAS Field Survey Results**

This section will provide a brief discussion of the results of the two surveys of Norfolk's inter-tidal zone, in order to highlight the strength and weaknesses of each methodology, and to underline the value of an interdisciplinary approach. The RCZAS field survey is reported on in detail elsewhere (Robertson et al. 2005). One hundred and twenty-four sites were recorded by both the NMP and the field survey. Seventy-five of these were newly identified by the NMP, and were subsequently identified on the ground; ten sites were initially discovered by the field survey and later identified on aerial photographs. The seventy-five new NMP sites made up c. 40% of known NHER sites identified during the field survey and 18% of the total number of archaeological sites recorded on the ground.

One of the main strengths of the field survey methodology over that employed by the NMP is that it offered an opportunity to investigate smaller elements of the archaeological record, in particular material culture. For example, archaeological deposits and finds eroding out of the

soft Pleistocene cliffs of east Norfolk constituted a significant proportion of pre-NMP NHER entries for the Coastal Zone. These range in size and importance from a find of a single coin to the fossilised remains of the West Runton elephant. Such finds can offer a valuable insight into some of Norfolk's earliest prehistory. The RCZAS field survey recorded large numbers of artefacts and assemblages within the Coastal Zone, many of which had eroded out of cliffs and dunes. They ranged from prehistoric pottery and flints to World War Two bolt-cutters. The recovery of a Roman bracelet (NHER 41541) from a deposit eroding out of the cliffs at Weybourne highlights the potential importance of such artefactual data. Dated finds recorded in situ add to the known chronology of the Norfolk coast, but also provide an indication of the number – and potential significance – of archaeological sites that are being eroded, an aspect that often goes unrecorded.

It is possible, given the right conditions, for exposed and eroding peat beds to be identified from aerial photographs (see Section 12.3 and Case Study XXXIV); however, the presence of striations and fissures in the intercalated clays and peats, caused by the action of the sea, means that the archaeological origin and significance of the few possible features and structures identified within these deposits is uncertain. The recording of such deposits, and any associated artefactual data, through field survey and excavation is essential. As mentioned above (Section 12.7.1), the identification on aerial photographs of even reasonably substantial structures, such as the timber circles at Holme, is problematic. The aerial photographs can often only provide an indication of the former presence and extent of exposed deposits in the past.

The RCZAS field survey also offered an opportunity to record the current condition of sites within the Coastal Zone, providing information vital for the management of this vulnerable archaeological resource. The ability to provide detailed, up-to-date information about the present state and survival of sites from aerial photographs is relatively limited, being restricted by the availability of recent aerial photography. In a dynamic coastal and inter-tidal environment the condition of a site can change quite rapidly, due, for example, to erosion, deposition and tidal patterns. Therefore even photography taken only one or two years earlier cannot necessarily provide an accurate indication of a site's current state. Consequently repeated monitoring of sites on the ground is essential. The two methodologies employed by the RCZAS – NMP and ground-based field survey – work well together in this respect. For example, the identification and mapping of the earthworks of Black Joy Fort from photographs from the 1970s (Section 10.11.2) represents a significant discovery, as prior to the NMP the site was thought to have been completely destroyed in 1953. The location of these features on the ground by the RCZAS field survey, using the NMP mapping as a guide, allowed the current state of these important Armada defences to be established (Robertson et al. 2005, 146).

The main strength of the NMP methodology, when compared with that of the field survey, is the use of historic aerial photographs. This provides a longer timeframe within which to study the archaeological landscape. The field survey provides a single, recent snapshot of those sites visible on a given day; the systematic assessment of historic aerial photographs, often spanning c. sixty years, allows for repeated assessments of particular sites or areas to be made. This is of particular importance when dealing with dynamic and vulnerable landscapes, such as the inter-tidal zone and eroding coastlines. The use of photography dating back to the 1940s provides opportunities to record sites now lost to erosion or covered by shingle and sediment. As mentioned in Section 12.7.1, many of the standard vertical aerial photographic sources used by the NMP are unsuitable for detailed archaeological assessment of the inter-tidal zone. The repeated flying undertaken by the RAF, Ordnance Survey and Environment Agency, however, provides many opportunities to view these stretches of coast. The depositional and tidal conditions inevitably vary from flight to flight. These changing local conditions also had an obvious impact on the field survey results, with large and complex sites potentially not being visible on the day the area was surveyed. It is significant in this respect that the large mussel beds in Blakeney Channel (Section 12.6.2) were not detected at all during the RCZAS field survey, despite being visible on the ground earlier that year, when they were visited by a member of the Norfolk NMP Liaison Group. At this time the site was clearly visible and easily accessible, and the structural details of the site were recorded. It is also the case that this site is only visible on a small fraction of the available aerial photographs covering the area, highlighting the importance of the multiple windows provided by the NMP aerial photographic sources.

The use of the historic photography also allowed for the World War Two sites and remains identified by the field survey to be understood into their contemporary context. For example, the discrete scatters of concrete and brick fragments frequently recorded by the RCZAS field survey, were often demonstrated by the NMP mapping to be part of a destroyed World War Two structure that originally formed part of a much wider system of defences.

The other main strength of the NMP methodology, as opposed to that employed by the field survey, is that it allows a broader understanding of the historic environment to be formed. The mapping and recording of sites at a landscape scale encourages a contextual approach to the interpretation of the archaeology. From this aerial and landscape perspective, it is often possible to observe how different components of the historic environment relate to one another. This perspective is easily lost when small sections of the coast are dealt with in survey blocks, each potentially recorded by a different individual. The NMP data often allows fragmentary and dispersed remains, spread across several sections of beach, to be understood within their wider archaeological context.

# 13 Conclusions and Recommendations for Further Work

With the creation of 3,354 new sites (a substantial proportion of which were new discoveries), the amendment of 915 existing NHER records, and the formation of an archaeological map covering 855 sq km, there can be no doubt that the contribution of the NMP to the study of the historic environment of Norfolk's Coastal Zone has been enormous. This report represents a first attempt to create a more synthetic narrative for the considerable body of data created by the project. As further areas of the county are covered by the NMP – providing context and comparison for sites mapped within the Coastal Zone – and as the coastal mapping is put to use by a wide variety of researchers, whether professional, student or amateur, it can be hoped that our understanding of this archaeology will become both deeper and more wide ranging.

During the course of the project, and the writing of this report, a number of themes have become apparent; these are summarised below. Others, which relate to a specific site-type or period, or to particular environmental conditions, such as problems of working in the inter-tidal zone, are discussed in the relevant chapter or section of the main body of the report.

## 13.1 The Earlier Prehistoric Period

While the results of the Coastal Zone NMP have undoubtedly added greatly to our knowledge and understanding of sites dating to the Neolithic and earlier Bronze Age, the information derived from aerial photographs is far from comprehensive. In particular, there is a bias towards ceremonial and funerary 'monuments', whose substantial construction and distinctive plan makes them relatively easy to recognise, whereas evidence for settlement or the agrarian economy is almost entirely absent from the photographs. Although other forms of archaeological investigation have uncovered evidence of such activity, how this relates to the monuments visible on the aerial photographs is generally unclear. Were ceremonial and funerary landscapes, such as that identified at Roughton and Hanworth (Case Study I) entirely sacred spaces, or were they also utilised for more mundane activities? If they were conceived of as sacred landscapes, when did this conception begin, and for how long did it last? Was the eventual domestication of such landscapes a gradual process, or were these shifts in perception and belief articulated in a more abrupt and radical way?

Further ground-based investigation, in particular excavation, of a greater number of Norfolk's prehistoric monuments may allow us to begin answering at least some of these questions. Such investigation is required not only for those sites facing imminent destruction by quarrying or other modern developments mitigated by PPG16, but also of sites specifically

selected on archaeological grounds, for their typical (or unique) characteristics. While preservation in situ of Norfolk's causewayed enclosures, for example, might be regarded as the preferred option given their rarity and significance – and in the absence of both the necessary will and resources, this has in effect been the only option – the fact is that they are all currently being ploughed, and as a consequence are not being preserved. Some excavation of even just one of these sites, before the subsurface features and deposits have been utterly destroyed, would seem to be a matter of urgency.

Further investigation of possible domestic sites of this period would facilitate the recognition of such sites from the aerial photographic evidence. More detailed analysis of those sites known from excavation would isolate features suitable for comparison with possible cropmark examples. Efforts targeted towards the retrieval of dating material from enclosures and field systems mapped by the NMP and tentatively dated to the Bronze Age, might allow the chronology suggested for these sites to be tested and made more sensitive. The correlation of a surface lithic assemblage at Nova Scotia Farm with the coaxial field system visible on aerial photographs and proven by excavation to be Bronze Age in origin (NHER 12828), may indicate an important tool for identifying other Bronze Age field systems within the large body of coaxial and rectilinear field systems mapped by the NMP. Further analysis of the occurrence of such assemblages with these types of cropmark site may allow for other early landscapes to be identified. The extent to which such sites remained in use into the later prehistoric period is another research topic where the NMP evidence could usefully be analysed in relation to other datasets.

### **13.2 The Later Prehistoric and Roman Period**

The Coastal Zone NMP has mapped and recorded vast swathes of enclosures and field systems of known, probable or possible Iron Age to Roman date. As has already been mentioned, the relationship between these sites and domestic sites of the earlier prehistoric period is far from clear, but certainly the aerial photographic evidence would support the view that the landscape became more populated, and more enclosed, during this period. Excavations, such as those undertaken along the route of the Bacton to Great Yarmouth gas pipeline, have provided dating evidence for some of these often complex, multi-phase cropmark sites (see Section 3.4; Bates in prep.). The dangers of taking this evidence at face value need to be borne in mind, however: such excavations are often limited in extent, and encounter features such as field boundary ditches in which there is generally a low incidence of finds or other dating material. The results of the partial excavation of unproductive features will only ever be a blunt tool in the dating of such extensive archaeological landscapes.

The problems of distinguishing Iron Age and Roman domestic sites from one another are discussed in Section 7.1. Through analysis and discussion an attempt was made to identify possible morphological characteristics for this transitional period within the NMP data, with



reference, where possible, to associated dating material. Several possible trends were identified, although the lack of excavation data makes any conclusions tentative. Enclosures seemingly associated with Roman date finds tend to be more regular and rectangular than those thought to date to the Iron Age. The extent, however, to which the Late Iron Age to Roman division actually represents meaningful classifications still needs to be explored, particularly through excavation and other fieldwork. It is likely that many sites remained in use across the transition period. Another noticeable trend was identified amongst the round houses, which tended to fall into two size groups, measuring either 4.0–9.5m or 12.0–17.0m in diameter. It seems likely that this difference reflects a chronological distinction, although it is possible, as outlined in Section 7.1.2, that it represents a functional variation. Further excavation of these domestic sites is essential to answer these questions with any certainty.

The distribution of mapped sites of Iron Age to Roman date raises interesting questions about the use of Norfolk's coastal landscape during these periods. Whilst the high density of sites in the northeast and east of the county can perhaps be explained by the presence of agriculturally productive, rich loam soils, few high-status Roman settlements or villas have been recorded in this area. The distribution of Roman coin hoards in the county is heavily biased towards south Norfolk, with few recorded anywhere in the Coastal Zone. The apparently high level of Iron Age to Roman activity revealed by the NMP in the northeast and east does not appear to have been accompanied by economic wealth. By contrast, a smaller area of intense Iron Age to Roman activity along the edge of the chalk escarpment in the west of the county has revealed evidence of high-status settlement. These differences highlight themes for further research, concerning their origins and significance as well as the management and use of the landscape during the Roman period. Completion of the NMP mapping of the Broads Zone in June 2007 will provide a wider context for the analysis of the results from the eastern part of the Coastal Zone.

The NMP mapping has already provided a broader context for the known Roman military sites located along the coast, with additional cropmarks being recorded at all three sites. The possible discovery of a previously unrecorded Roman road is highly significant, but, like many sites mapped by the NMP, it would benefit greatly from fieldwork to confirm and enhance its interpretation.

### **13.3 The Anglo-Saxon Period**

The problems of recognising archaeological features of the Anglo-Saxon period from aerial photographic evidence are discussed in detail in Chapter 9. The apparent invisibility of features of this date, even when cropmarks of earlier or later periods are visible, has also been described. To address this problem further work needs to be carried out nationally to clarify the morphology of settlement sites of the early to middle Anglo-Saxon period. Norfolk, with its high number of recorded metal detector finds, is well placed to contribute to this

debate. It is possible that many of the rural Roman sites mapped by the NMP could have continued into the Anglo-Saxon period. However, at present any Anglo-Saxon period activity at these sites is generally indistinguishable from the Roman and late prehistoric cropmarks and it falls to metal detecting, fieldwalking and ultimately excavation, to provide confirmation of a feature's later date.

#### **13.4 The Medieval to Post Medieval Period**

The large number of medieval and post medieval sites recorded by the project represents a substantial body of data, which remains largely unanalysed. There is huge potential for further research into topics such as field systems, enclosures, or roads and trackways, in particular utilising historic maps and documents. Initial attempts at such analysis have been undertaken on an ad hoc basis for only a limited number of sites as part of the NMP recording, and some of the results are described in Chapter 10. It is hoped that in the future other researchers will pursue such investigations more thoroughly, utilising a wider range of source material. Similarly, the use of the NMP's interpretations and transcriptions for researching settlements might also be taken up, for example where aerial photographs have added significant new information to previously surveyed earthwork sites.

#### **13.5 The Twentieth Century**

Twentieth-century military archaeology has formed a very significant component of Norfolk's Coastal Zone NMP. The information gained from the recording – often in great detail – of such sites has added greatly to our knowledge of the location and form of coastal defences, military camps, and other installations. It is in locating specific sites, and in their detailed recording, that the main value of the NMP approach lies. Repeated RAF coastal reconnaissance throughout the war years allowed for the rapidly changing and often temporary defences to be recorded, many of which have left no surviving traces on the ground. There are, however, problems in the identification of some sites and features, as air photo interpreters do not necessarily have the specialist knowledge of military sites required to identify the many different elements visible on the aerial photographs. The most productive use of aerial photographs is made when those with specialisms in aerial photograph interpretation and 20th-century military archaeology work in tandem. This should be borne in mind not just for future NMP projects, but for all projects concerned with the recording of modern military sites.

It is also the case that the 20th-century military archaeology of the Norfolk coast has been extremely time-consuming to map. This is in part due to the level of detail visible on the consulted aerial photographs, and the number of wartime aerial photographs available. In addition, the coastal location of many of the sites makes rectification of the aerial photographs problematic, while coastal erosion exacerbates this problem by altering the coast and removing potential control points. While the time spent on this element of the project was justified in the context of the RCZAS – matching, for example, the methodology employed for

the Suffolk Coastal NMP – it is intended that any further NMP work within the county will record such sites more schematically. The records will form an assessment-level dataset, which will hopefully provide the basis for more detailed research, utilising the aerial photographs to their full potential.

Although the numbers of new World War One sites were low when compared with those dating to World War Two, the NMP mapping has revealed many significant new World War One sites. The identification of several World War One sites where earthworks still survive, such as the firing range at Winterton (NHER 42440), represent important discoveries and it is hoped that further investigation and management of these sites takes place, for example as part of the Norfolk Monuments Management Project (NMMP).

The 20th-century military archaeology of the Norfolk coast, like that of the UK as a whole, is a popular strand of research for amateur archaeologists, local historians, and a subject that is accessible to and appreciated by large numbers of the general public. As such, the wartime aerial photographs used by the NMP, and the project's mapping and interpretation, are an ideal subject for further outreach and dissemination, aimed at a non-specialist audience. This might take the form of an illustrated book; guided walks taking in surviving sites, perhaps detailed in leaflets downloadable from the NCC website; or information panels.

### **13.6 The Future of the NMP in Norfolk**

It is an English Heritage priority for the NMP to be undertaken across the entire country; at present c. 36% has been mapped. In terms of land, Norfolk's Coastal Zone represents approximately 15.5% of the county as a whole; since the completion of the Broads Zone in August 2007, just over 25% of the county has been mapped. Given the overall success of the NMP methodology for discovering new sites, and for providing new information about those that are already known, there is a clear need for the NMP to be rolled out across other parts of the county. With this in mind, there are at present two new projects in progress or proposed for Norfolk: one, which is funded by the ALSF (English Heritage Project No. 5241MAIN) and is now underway, forms one element of an assessment of the county's aggregate landscapes (Massey 2007); the project design for a second, driven by the need to address development pressures and covering the historic urban centres of Norwich and Thetford together with the A11 corridor, was submitted to HEEP in August 2007 (English Heritage Project No. 5313PD; Tremlett 2007).

### **13.7 Aerial Reconnaissance**

Since 2000, when the work of Derek Edwards as Air Photographer for NLA came to an end, aerial reconnaissance within the county has been extremely limited. While new photography by local fliers continues to be submitted to the NAPL, and although new sites continue to be discovered, there is little targeted survey of specific areas or types of site. The potential for further reconnaissance work is still considerable, despite a long history of aerial survey within

the county; the likely benefits of targeted aerial reconnaissance in the inter-tidal zone have already been discussed (Sections 3.3 & 12.7.1). Colour reconnaissance, taken at the margins of reclaimed coastal marshes at a suitable time in the agricultural calendar, would be well placed to identify the characteristic red earth of Iron Age to Roman salt production sites; the potential success of such reconnaissance has recently been established by the Suffolk Coastal NMP (Hegarty & Newsome 2005, 55-59). The only 'red hills' to be recorded from aerial photographs within the Norfolk Coastal Zone to date have been identified from associated finds of briquetage.

The areas mapped by the NMP thus far also show clearly where few sites have been recorded in inland areas, or where an extensive site is interrupted by a field of unresponsive crop, for example. Within the county as a whole, there is even greater potential, particularly in those areas where historically aerial photography has played a relatively minor role, such as the claylands of central and southern Norfolk, or the vast area of Thetford Forest which covers a substantial portion of Breckland. LiDAR surveys have been carried out by the Environment Agency of certain sections of the county, and there is also potential for data derived from this new technology to be analysed with a view to recording archaeological sites, and improving our understanding of their landscape setting.

### **13.8 Synthesis and Dissemination of NMP Results**

This report represents only a first attempt to draw together the results of the Coastal Zone NMP into a more synthetic narrative. It is hoped that in the future the NMP data will be utilised in more detailed studies of specific geographic areas, site-types or periods, where it can be integrated further with existing datasets, or can inform new investigations using alternative methods of inquiry. There are numerous strands and themes – the medieval and post medieval salt industry or the Iron Age/Romano-British farmsteads, for example – which are prime areas for further investigation. This might be small-scale in nature, with the NMP mapping providing the context for a detailed study of a specific site, or at the sub-regional, regional or national scale, the NMP sites forming a corpus amongst which distinctive characteristics and traits might be identified. Future resources might also be invested in the dissemination of NMP data, both via traditional means – journals, leaflets, etc. – or digitally. Having been produced in a digital environment, much of the basic NMP mapping and recording is ideal for dissemination via the World Wide Web; for example, it could perhaps be added to future versions of the forthcoming Norfolk Heritage Explorer website, which will make the NHER accessible online, or to the E-map Explorer website ([www.historic-maps.norfolk.gov.uk](http://www.historic-maps.norfolk.gov.uk)). The latter provides digital viewing of historic maps across the whole of the county and also allows them to be overlain on a rectified mosaic of aerial photographs from 1946 (RAF) and 1988 (BKS). This resource is seen as having a great many uses for the NMP mapping and interpretation.

# Appendix 1: Methodology

## **A1.1. Archaeological Scope of the Survey**

All archaeological monuments, both plough-levelled and upstanding, dating from the Neolithic period to the 20th century, including industrial and military remains up to 1945, have been recorded, except those late post medieval and modern sites that are adequately recorded by historic maps.

### **Plough-Levelled Features**

All cropmarks and soilmarks representing features of archaeological origin have been recorded.

### **Earthworks**

All earthwork sites visible on aerial photographs (whether previously surveyed or not) have been recorded. The transcription of earthwork sites may have benefited from consultation of ground-survey diagrams (mainly at a scale of 1:1000), particularly those of 135 monuments that were produced for The Earthworks of Norfolk (Cushion & Davison 2003). This information was augmented and complemented where necessary by the aerial evidence. The earthworks were recorded whether or not they were still extant on the latest aerial photographs. The accompanying ExeGesIS database records specified which elements of earthwork groups were surviving or plough-levelled.

### **Buildings**

As a rule the survey did not record buildings other than those visible as earthworks, masonry foundations, cropmarks or soilmarks. Standing buildings visible on the earliest photographs but since destroyed were recorded when there was no other adequate record (a map record existed in most cases). These were transcribed and the date and cause of their destruction, where known, was recorded.

### **Industrial Archaeology**

The survey recorded evidence of industrial activity, such as salt-making, lime-burning and brick-making, where it could be recognised as pre-dating 1945 and only when the sites were not recorded adequately by historic maps. Small-scale extraction sites were only recorded where they were thought to be archaeologically significant or had a bearing on surrounding archaeology.

### **Military Archaeology**

All former military sites and installations up to 1945 visible on aerial photographs were recorded, in particular those World War Two sites visible on photographs taken by the RAF during the 1940s. Twentieth-century military remains, such as airfields and camps, were mapped at an appropriate level of detail, ranging from a dotted outline defining their extent to the recording of the main structural components. Isolated military sites, such as pillboxes and searchlight batteries, were mapped and recorded, again at an appropriate level of detail. Military sites along the coast were mapped and recorded in the greatest detail, due to the particular importance of this defensive landscape (Chapter 11 and Section 13.5).

### **Inter-Tidal Archaeology**

Norfolk has over 90 miles of coastline; the archaeological features within this extensive area fall broadly into two categories. Within the estuaries and inter-tidal zone were features such as hulks, shellfish pits, fish traps and other timber structures. The second category consisted of earthworks and other features relating to flood defence and land reclamation also constituted a large part of the archaeology of these areas. Earlier coastal features such as salterns and 'red hills' were recorded within the reclaimed zones. Along those parts of the coast that have suffered erosion, the incidence of pre-World War Two inter-tidal sites was considerably lower, due to the continuing destruction of these areas.

### **Coastal Erosion and Sea-Level Data**

The pilot RCZAS NMP areas included transcriptions of historic high and low tide-levels inferred from aerial photographs from the 1940s to 1990s. Once the coastal mapping had been transferred from the RCZAS to the Norfolk NMP, it was decided that this tidal transcription would not be continued, due to the time-consuming nature of the task when weighed against the potentially inaccurate results. This policy is in line with the decision reached by the Suffolk Coastal NMP (Hegarty & Newsome 2003, 8). Coastal regression data can be derived more easily and more accurately from maps.

### **Historic Map Data**

The pilot RCZAS NMP areas included transcriptions of historic map data produced during the desk-based archive assessment undertaken by Ivan Ringwood. This too was discontinued once the coastal mapping had been transferred from the RCZAS to the Norfolk NMP, as it was considered to be an inappropriate use of NMP time and had not been included in the original project specification (Allen 2000).

### **Field Boundaries**

Where recently removed field boundaries were visible as cropmarks on aerial photographs, they were not plotted or recorded, particularly if they were depicted on easily accessible historic maps (such as the Ordnance Survey 1st edition 6 inch). If they were extensive, and could be confused with the remains of earlier field systems, their presence and extent was in

some cases mapped and recorded, or otherwise noted on the Map Note Sheet or sketched on a separate layer in the AutoCAD drawing.

### **Ridge and Furrow and Water Meadows**

Remains of ridge and furrow are not common in Norfolk, but where noted they were recorded using the standard NMP conventions to indicate the extent and direction of the furrows. Areas of water meadows were mapped and transcribed in detail, using the bank and ditch layers.

### **Drainage Features**

Large-scale drainage features dating to the post medieval period and earlier were mapped within the Coastal Zone, where these were not marked on the Ordnance Survey 1st edition 6 inch map. This methodology was continued into the more inland areas of the Coastal Zone, where features more typical of the Broads landscape were evident. It included large areas of the formerly alluvial Halvergate Marshes and upper valley fens, where extensive and complex swathes of post medieval drainage features were revealed. The mapping of drainage features is not normally included within the standard NMP specification and it was agreed that such mapping would not continue past the Coastal Zone. The drainage features form an integral part of the development of the Broads landscape and the sample areas mapped highlight the suitability of aerial photographs for recording and reconstructing former alluvial landscapes. However, much of the data might equally have been derived from a detailed historic map-based search, and many of the features mapped by the NMP were in part depicted on Tithe and Enclosure maps.

### **Parks and Gardens**

Parks and gardens were recorded, including those listed in English Heritage's Historic Parks and Gardens Register and Norfolk County Council's Inventory of Historic Parks and Gardens; the latter are recognised as being of local or regional importance.

### **Geological and Geomorphological Features**

Geological features were not plotted unless their presence helped to define the limits of an archaeological site. Geological and geomorphological features may have been noted in site records, as their presence in some instances assisted with an assessment of the archaeological potential of an area.

### **Areas of Destruction/Extraction**

Areas of former quarrying thought to be of archaeological or historical significance have been mapped. More recent, large-scale quarrying, which is likely to have destroyed archaeological deposits, may have been noted on a separate AutoCAD layer when considered relevant to the understanding of a particular area.

## A1.2 Sources

There have been significant changes in the sources utilised by the Norfolk NMP since the original Project Design was written (Allen 2000).

### Aerial Photographs

Due to a misconception concerning the range of the NAPL collection, the original Project Design specified that only NAPL photography would be consulted (as detailed in Allen 2000, section 5.1). Use of the NMR collection is now a requirement of the NMP nationally. This contains 108,682 aerial photographs of Norfolk, of which it is estimated that the NAPL holds approximately 55,000. Therefore, the inclusion of the NMR collection doubled the number of photographs consulted by the project.

The main non-NAPL photographic sources consulted were:

- *National Monuments Record (NMR)*

The NMR photographs included, in summary, the RAF vertical and M-series oblique aerial photographs, Ordnance Survey vertical photography, and other commercial vertical photography. The project also borrowed specialist oblique aerial photographs, where a copy did not exist in the NAPL.

- *Unit for Landscape Modelling, formerly Cambridge University Committee for Air Photography (CUCAP)*

The project consulted all available vertical and oblique aerial photographic prints and film.

Other photographs utilised by the Norfolk NMP included:

- 1:10,000 scale countywide coverage taken by BKS in 1988 and held by the Planning and Transportation Department of Norfolk County Council.
- 2002 coastal and estuarine reconnaissance taken by the Environment Agency. The prioritisation of the Coastal Zone, in particular the inter-tidal areas, meant that it was important for the project to consult the Environment Agency 1:5000 coastal reconnaissance. The project loaned a full run for the Norfolk Coast taken in 2002, which totalled 775 vertical prints.
- ADAS reconnaissance of the Norfolk Broads taken in 1995 was loaned from the Broads Authority for those areas for which there was coverage (only the eastern part of the Coastal Zone).



## **Documentary and Historic Map Sources**

NHER maps and records were the primary archival sources. NMR records, the Excavation Index and Ordnance Survey 1st edition 6 inch maps were also consulted for each area.

In addition to historic Ordnance Survey maps, Enclosure and Tithe maps were consulted where available via the E-map Explorer website [www.historic-maps.norfolk.gov.uk](http://www.historic-maps.norfolk.gov.uk). This allows maps from across the whole county to be viewed, and also allows them to be overlain on a rectified mosaic of aerial photographs from 1946 (RAF) and 1988 (BKS). This product is extremely useful for NMP mapping and interpretation.

Historic maps and documentary references relating to the Coastal Zone were collated by Ivan Ringwood (Centre for East Anglian Studies, UEA) and were supplied to the project to aid its interpretation of the coast. They included transcribed maps and a digital archive, cataloguing and summarising the documentary sources available at local Public Record Offices. As stated in A1.1 above, these maps were only consulted and not digitised.

All Ordnance Survey maps are reproduced in this report with the permission of the Controller of Her Majesty's Stationery Office (© Crown Copyright. All rights reserved. Norfolk County Council Licence No. 100019340).

## **A1.3. Methodology**

### **Digital Transcription**

Separate AutoCAD drawings were produced for each 1:10,000 Ordnance Survey quarter sheet.

As much as possible, photographs were rectified using AERIAL 5.18 or 5.29. Control was provided by digital Ordnance Survey 1:10,000 base maps. A level of accuracy of 1–3m to the map and of 5–15m to true ground position could therefore be expected. The Coastal Zone mapping encountered particular problems with inadequate control, due to the absence of control points from some areas and the removal of others through coastal change, and resultant inaccuracies in the location and plan of coastal – and in particular inter-tidal – sites must be expected. Where necessary the digital terrain model function in AERIAL was used to compensate for distortion due to slope and terrain.

Rectified images were imported into an AutoCAD drawing. Archaeological features were transcribed onto the relevant AutoCAD layer using the appropriate line and colour conventions, and the original image was then discarded. Where necessary, small amounts of additional detail were added to the AutoCAD plot by eye.

A digital export of the AutoCAD map was subsequently transferred to a MapInfo layer on the HBSMR. This layer now exists as a raster layer in the MapInfo environment set up for the NHER. In order to make the mapping clearer, the colour of some features was altered for the MapInfo export; all AutoCAD layers have been returned to the standard NMP conventions for archiving by the NMR and NHER.

## **Database Records**

### *AutoCAD*

Object Data tables were created and incorporated into each AutoCAD drawing. A table called 'MONARCH', recording the NHER number, was originally included to concord with other NMP projects. However, it was later agreed that this table was superfluous and no longer required. An object data table called 'NORFOLK' was created to include basic information, including NHER number, monument type, period and photographic references, plus any pertinent notes on the site. The NORFOLK table was transferred with the NMP mapping to the MapInfo layer linked to the NHER database. For both tables the object data was attached to both the monument polygon and the mapped features.

### *NHER (ExeGesIS HBSMR)*

For each monument or group of monuments (new and existing) a site record was created on the county's ExeGesIS database. This is currently publicly accessible on the NHER database, and will soon be available on the World Wide Web via the Norfolk Heritage Explorer website (a project funded by the Heritage Lottery Fund). The NMP records will be exported to the NMR database when the necessary software is in place.

### *MORPH Records*

Where it was felt to be appropriate or necessary, with reference to the MORPH guidelines provided by English Heritage, morphological recording was undertaken for individual sites or elements of sites. Initially these were created on an Access database, but with the addition of a MORPH module to the HBSMR in August 2004, this information has since been recorded directly within the NHER. The old Access records have been exported into the new HBSMR version.

### *Event Records*

An event record was created for each Ordnance Survey quarter sheet providing information on the compiler, dates of work, associated events and any additional information that would have previously been included on a Map Note Sheet. These event records have been linked to all the monument records for that sheet. The sites have also been linked to a parent event record for the whole project.

#### Sources and Progress Sheet

A brief record was kept of aerial photographic sources consulted and the general progress of the mapping, with regards to time taken on each sheet and numbers of records created.

#### **A1.4. Storage and Exchange of Data and Archiving**

All photographic material on loan from the NMR and CUCAP collections was stored in locked cupboards within the NAPL office.

All digital mapping and recording data has been stored on the Norfolk County Council NLA shared drive for the duration of the project, as this has a daily back-up. The maps, in their original AutoCAD and exported MapInfo formats, are also stored on CD. The exported data is stored as a MapInfo layer on the NHER database. This database is on the NLA shared drive and weekly CD back-ups are created and stored off-site.

Copies of the digital maps and records will be archived within the NMR, according to current guidelines for NMP projects.

A mechanism is still to be devised for the eventual digital transfer of the NMP records created on the NHER to the NMR database AMIE, which is a requirement for all externally contracted NMP projects. It is intended to export the data in landscape zone blocks (i.e. the Coastal Zone, the Broads Zone). Some time has been spent attempting to standardise the fields and terminology used in the NHER records with regards to NMR conventions. It is therefore anticipated that the data transfer will be relatively straightforward. At present the Norfolk NMP has implemented the use of chronological periods, such as 'World War One' and 'World War Two', which are not standard terms within the NMR database. It is therefore anticipated that such terms will have to be globally changed to the NMR equivalent, i.e. 'Modern', before any data transfer takes place.

Other NMP projects (such as the Suffolk Coastal NMP) are currently negotiating the transfer mechanism needed to copy HBSMR records to the NMR, and it is hoped that the same transfer process can be used for the Norfolk data.

The copyright for all transcriptions, digital files and accompanying records (paper and digital) is jointly held by English Heritage and Norfolk County Council.

### **A1.5. Project Staff**

|                        |   |
|------------------------|---|
| Helen Winton (EH)      | Project Co-ordinator  |
| David Gurney (NLA)     | Project Executive   |
| Jan Allen (NLA)        | Project Manager   |
| Alice Cattermole (NLA) | Project Manager & Historic Environment Record Officer (GIS) |
| Sarah Massey (NLA)     | Senior Air Photo Interpretation Officer                     |
| James Albone (NLA)     | Air Photo Interpretation Officer                            |
| Sophie Tremlett (NLA)  | Air Photo Interpretation Officer                            |
| Mark Brennand (NLA)    | Air Photo Interpretation Officer                            |
| Henrietta Clare (NLA)  | Air Photo Interpretation Officer                            |
| Andy Miller (SCC)      | Air Photo Interpretation Officer (pilot areas)              |
| Abby Hunt (SCC)        | Air Photo Interpretation Officer (pilot areas)              |

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## Historical Maps and Documents

Tithe and Enclosure maps for many Norfolk parishes are available digitally via E-Map Explorer at <<http://www.historic-maps.norfolk.gov.uk>>. These maps are named in the report and no further references are given.

Other maps and documents consulted during the project are listed below by author or parish, using the following abbreviations: Norfolk Record Office (NRO).

- Burnham Salt Marshes 1822. *Plan of Burnham Salt Marshes in the County of Norfolk from a survey made by H.R. Palmer under the direction of T. Telford Esq. Civil Engineer. With a subsequent survey made under the direction of W. Chapman Esq. Civil Engineer by T.O. Blackett, 1822* (NRO: MS 21124 179 x 4)
- Corbridge, J., 1724. *The West Prospect of the Town of Great Yarmouth* (NRO: GYM 6)
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