# National Mapping Programme Project for Lothingland, Greater Lowestoft and North Suffolk Coast and Heaths

National Heritage Protection Commissions Programme
Project No. 6642


Ellen Ford, Sarah Horlock and Sophie Tremlett

March 2015

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# National Mapping Programme Project for Lothingland, Greater Lowestoft and North Suffolk Coast and Heaths

National Heritage Protection Commissions Programme
Project No. 6642

A report for English Heritage
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## Figures

*Cover Illustration: Enclosures, trackways and fields showing as cropmarks at Lound, Lothingland. Photograph © Norfolk County Council BKS 0868 (NCC 3947) 06-AUG-1988*

## Mapping Conventions

The mapping conventions used by the project, summarised below, are based on the national standards used for NMP. In this report, deviations from these conventions for specific illustrations are noted in the figure caption.

Bank (also mound, track, platform, *etc*.)

Ditch (also pit, post hole, *etc*.)

Structure (also buildings, stonework, concrete, *etc*.)

Extent of area (used to define extensive sites comprising numerous disparate elements, or features that have not been mapped individually, also sites where the nature or extent of what is visible is unclear)

Ridge and furrow (used to define the extent of a block of ridge and furrow, arrow indicates direction of furrows)

Monument polygon (used to define the extent of a site, equating to a Suffolk Historic Environment Record Monument record

Suffolk Historic Environment Record Parish Code **SHER SOL 015**

## Abbreviations

| | |
|---|---|
| ALSF | Aggregates Levy Sustainability Fund |
| AONB | Area of Outstanding Natural Beauty |
| ATD | Anti-Tank Ditch |
| CASL | Coastal Artillery Searchlight |
| CUCAP | Cambridge University Collection of Aerial Photography |
| ECDB | Emergency Coastal Defence Battery |
| EH | English Heritage |
| EHA | The English Heritage Archive |
| ETD | Environment, Transport and Development (NCC) |
| FDL | Forward Defended Locality |
| HAA | Heavy Anti-Aircraft [battery] |
| HER | Historic Environment Record |
| NCC | Norfolk County Council |
| NHER | Norfolk Historic Environment Record |
| NHES | Norfolk Historic Environment Service |
| NHPP | National Heritage Protection Plan |
| NHPCP | National Heritage Protection Commissions Programme |
| NMP | National Mapping Programme |
| NRHE | National Record of the Historic Environment (formerly the National Monuments Record [NMR]) |
| RNPS | Royal Navy Patrol Service |
| SCC | Suffolk County Council |
| SCCAS | Suffolk County Council Archaeological Service |
| SC&H | Suffolk Coast and Heaths [AONB] |
| SHER | Suffolk Historic Environment Record |
| SM | Scheduled Monument |
| UEA | University of East Anglia |

## Acknowledgements

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The NMP mapping is copyright English Heritage (EH), licensed to Norfolk County Council and Suffolk County Council.

The mapping was undertaken using aerial photographic material from the English Heritage Archive (EHA) at Swindon, the Cambridge University Collection of Aerial Photography (CUCAP), Suffolk Record Office, Suffolk County Council Archaeological Service (SCCAS) and EH Aerial Survey (images supplied to English Heritage by Next Perspectives through the Pan-Government Agreement; Environment Agency lidar). Thanks are extended to all those who kindly provided access to the photographs and supplied loans of material, in particular Alan Martin (CUCAP), Luke Griffin (EHA), Jude Plouviez and Dr Richard Hoggett (SCCAS) and Simon Crutchley (EH). Extracts of Archaeological Records data held by the EHA were supplied by Graham Deacon of Archive Services.

The project was undertaken by Norfolk Historic Environment Service (NHES), the principal staff being Ellen Ford, Sarah Horlock and Sophie Tremlett, with Alice Cattermole and Alison Yardy (maternity cover) acting as Project Manager; David Gurney acted as Project Executive; Heather Hamilton provided database maintenance and support. The project was undertaken in partnership with SCCAS, and the authors would like to thank Jude Plouviez, Dr Richard Hoggett, James Rolfe, and the late Dr Colin Pendleton for their help and advice. At EH, advice and support was provided by Dr Matthew Whitfield, Project Assurance Officer, and Helen Winton, NMP Quality Assurance Officer.

Additionally, the authors would like to acknowledge and thank the wide variety of individuals and institutions who also contributed to the project. They include: Dr Will Fletcher (EH), Roger JC Thomas (EH), Dr Jess Tipper, Prof. Robert Liddiard (UEA), Prof. Tom Williamson (UEA), Dr Sarah Spooner (UEA), and Michael Sims (http://www.abfar.org.uk/). Finally, the team would like to acknowledge the project's debt to Derek Edwards (Norfolk Landscape Archaeology Air

Photographer 1974–2000) whose oblique aerial photographs were, as ever, an invaluable source for the mapping.

# Summary

This report summarises the results of the National Mapping Programme Project (NMP) for Lothingland, Greater Lowestoft and North Suffolk Coast and Heaths (NHPCP Project 6642). The project was devised to increase our understanding of, and enhance protection of, the historic environment of the Suffolk portion of Lothingland, the Greater Lowestoft area and the northern portion of the Suffolk Coast and Heaths (SC&H) Area of Outstanding Natural Beauty (AONB). This aim was achieved by mapping and recording archaeological sites and features visible on aerial photographs using English Heritage's (EH's) NMP methodology. NMP produces a landscape-scale assessment of the historic environment of the project area, contributing to EH's National Heritage Protection Plan (NHPP) Activity 3A4: Identification of terrestrial assets by non-intrusive survey, and also provides detailed site-specific data to complement information held within the Suffolk Historic Environment Record (SHER).

The project has made a significant contribution to the study of the historic environment of the varied urban, arable, heath and wooded landscapes within the project area and has identified and enhanced our understanding of a wide variety of sites ranging in date from the Neolithic to the Cold War. It has created 465 new records in the SHER, representing an increase of 69% within the area surveyed (a 238% increase on National Record of the Historic Environment data for the area); it has amended and enhanced a further 133 existing SHER records. It has created a digital archaeological map covering 118.25 sq km, bringing NMP coverage of Suffolk up to *c*. 14% (*c*. 17% after the completion of two blocks currently in progress or planned covering Ipswich and the Shotley Peninsula, NHPCP Project 6636).

The project has provided baseline locational and interpretative data that will facilitate planning, management, preservation and research decisions concerning the historic environment of the project area at every level, from strategic planning and national designation to local interventions, site visits and research. This report provides a synthesis of the types of archaeological sites encountered, including a summary of the results by period and more detailed discussions of specific research themes addressing the principal *foci* of the project: prehistoric to Roman field systems, Lowestoft in World War Two and earthwork survival

within the northernmost part of the SC&H AONB. The significance of the results for heritage protection is also discussed, and a list of sites where further heritage protection measures are recommended is provided as an appendix.

The project was undertaken and managed by Norfolk Historic Environment Service (NHES), part of Norfolk County Council (NCC), in partnership with Suffolk County Council Archaeological Service (SCCAS). Funding was provided principally by the National Heritage Protection Commissions Programme (NHPCP), with in-kind contributions from both NHES and SCCAS. Project and NMP quality assurance was provided by EH.

# 1. Introduction

## 1.1 Background to the Project

The Lothingland, Lowestoft and North Suffolk Coast and Heaths National Mapping Programme (NMP) project (NHPCP Project 6642) was designed in response to a call for proposals from English Heritage (EH) in July 2012 for archaeological aerial photograph and lidar mapping projects. These were to be undertaken using EH NMP standards, covering the mapping and recording of archaeological features from existing aerial photographs and other remote sensed data. The projects would form part of the delivery of Measure 3 of the National Heritage Protection Plan (NHPP); Activity 3A4, the identification of terrestrial assets via non-intrusive survey; Protection Result 3A4.2, identification and contextual understanding from aerial photograph/lidar mapping to provide base-level protection.

The project was developed and undertaken by the established Air Photo Interpretation Team at Norfolk Historic Environment Service, at that time part of the Environment, Transport and Development (ETD) Service at Norfolk County Council (NCC), in partnership with Suffolk County Council Archaeological Service (SCCAS).

## 1.2 Aims and Objectives of the Survey

The principal aims of the project were:

- to contribute to the recognition, understanding and protection of heritage assets within the project area;

- to make recommendations for sites where further heritage protection measures, including designation, might be appropriate (see Section 8 and Appendix 1);

- to contribute to ongoing research, both academic and developer-led, into the historic environment of eastern England; in particular, by completing NMP mapping for the 'island' of Lothingland, where extensive, multi-period cropmark landscapes of high archaeological significance have already been identified (see Section 5). Secondary *foci* were the defensive landscape of World War Two

Lowestoft (Section 6), and the survival of earthworks within the northernmost portion of the SC&H Area of Outstanding Natural Beauty (AONB) (Section 7);

- to provide baseline locational and interpretative data that would facilitate planning, management, preservation and research decisions concerning the historic environment of the project area, particularly that within the Lowestoft Enterprise Zone;

- to inform and encourage the promotion of the historic environment of the project area as a valuable resource, through the provision of web and outreach materials for EH, SCC and other key organisations, such as SC&H.

The project's main objectives can be summarised as:

- the identification, mapping, interpretation and recording to NMP standards of archaeological sites within the project area utilising all of the available aerial photographs and other remote sensed data (see Appendix A2.2 for sources);

- the integration of this data into the Suffolk Historic Environment Record (SHER), and ultimately the National Record of the Historic Environment (NRHE), through the provision of a GIS-compatible digital map layer linked to HBSMR database records. Copies of the finalised mapping will be supplied to SCCAS and the database records migrated to the HER following the completion of this report. Maps and records will be supplied to the NRHE upon request and once a suitable transfer mechanism is in place;

- the analysis and dissemination of the results of the project, primarily through the production of this internal summary report, and 'signposting' on the SCC and EH websites. Updated website material signposting the project's results and completion will be compiled in due course; a pdf copy of this report will be supplied to EH for downloading from its website.

## 1.3 Project Area

The project area comprises the Suffolk portion of Lothingland – an 'island' of higher land, bounded by the North Sea and the Broads, which straddles the Norfolk/Suffolk border – Greater Lowestoft, and the northern portion of the Suffolk Coast and Heaths (SC&H) Area of Outstanding Natural Beauty (AONB). It has addressed a gap in NMP coverage between three completed areas – Norfolk

Coast and Broads (EH Project 2913), Suffolk Coast (EH Project 2912) and Suffolk Aggregates Levy Sustainability Fund (ALSF) Waveney Valley (EH Project 3987) – and has raised NMP coverage to *c*. 14% in a county which has had comparatively little coverage to date. (A project currently in progress to cover Ipswich and the Shotley Peninsula, NHPCP Project 6636, will increase this further to *c*. 17% when completed.)

The project area was divided into three contiguous zones or Study Areas: Lothingland (*c*. 32.75 sq km), Greater Lowestoft (*c*. 22.5 sq km) and the SC&H AONB (*c*. 63 sq km) (Fig. 1.1). The project area was defined on a 1km sq grid, except along the Norfolk/Suffolk county boundary, where a previous NMP project (EH Project 2913) had mapped to the administrative boundary.

## 1.4 Summary of Project Methodology

In its general methodology and scope, the project was based on the standard NMP methodology (Winton 2012), and particularly that devised for the Updated Project Design covering the latter phases of the most recent NMP project undertaken in Norfolk (Norwich, Thetford and A11 Corridor, EH Project 5313; Cattermole 2010). The approach was also informed by previous experience of NMP projects in the northern, Norfolk portion of Lothingland (Norfolk Coast and Broads NMP, EH Project 2913) and the results of the Suffolk Coast NMP (EH Project 2912). By splitting the project area into three Study Areas, it was anticipated that, if required, minor adaptations to the project methodology could be made for each area (with the agreement of the EH Project Assurance Officer and Quality Assurance Officer). In practice, this was only required for the Greater Lowestoft Study Area, where the methodology for recording 20th-century military defences and related sites was clarified before mapping commenced.

The project looked at all available aerial photographs, held in national and local archives, which spanned 70+ years of photography, and included vertical photographs taken for non-archaeological purposes and specialist archaeological oblique photograph collections. Other airborne remote-sensed data were reviewed including lidar (laser scanning) and online photo mosaics such as Google Earth. Additional standard sources were also used, for example, historic mapping, HER monument records, published and unpublished excavation results and archaeological syntheses; however, the constraints of time meant that the use of such material was by necessity limited.

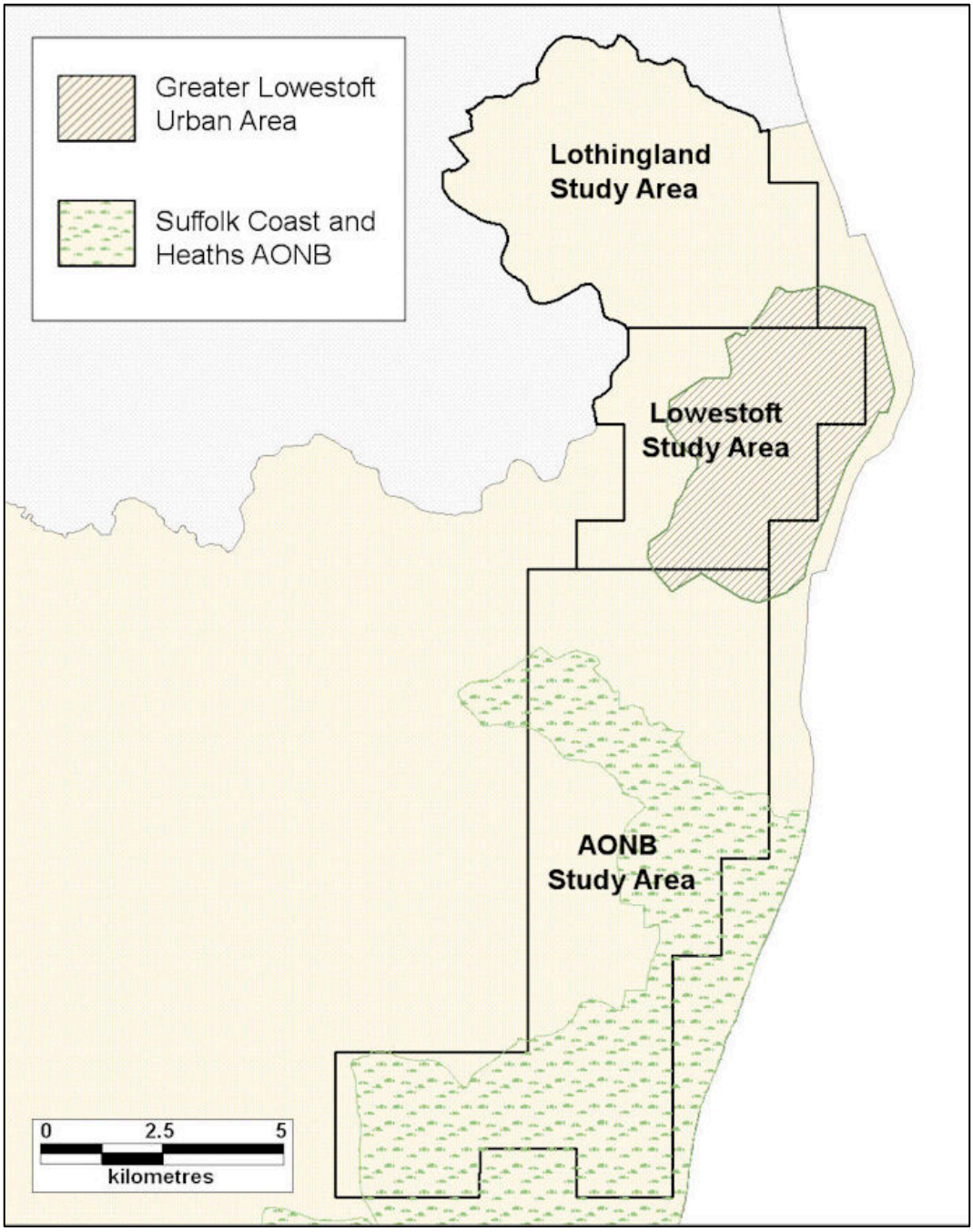


**Figure 1.1. The location of the project's Study Areas. AONB outline © Natural England copyright 2014. Contains Ordnance Survey data © Crown copyright and database right 2014.**

All archaeological sites and landscapes were analysed, with dates ranging from the Neolithic period to the Cold War. The scope of NMP includes recording buried sites, usually visible as cropmarks, features seen as earthworks and stonework, and some structures and buildings. Standard mapping and recording techniques were used to produce an archaeological map of features visible on the aerial photographs with linked archaeological site descriptions. The site

descriptions include references to the source aerial photographs, to inform any re-evaluation of a site, for example for development or research purposes.

The archaeological map was created in AutoCAD from aerial photographs rectified and geo-referenced using OS MasterMap mapping (usually 1:1250 scale). Standard layers such as 'BANK' and 'DITCH' were used to record the form of the archaeological remains, and these were then exported and formatted in MapInfo. Polygons indicating the limits of each site were linked to associated HBSMR database records in a standalone copy of the SHER. The HER records include a descriptive account and an index of the interpretation, form (cropmark, earthwork, *etc.*) and date of the features. The archaeological interpretations were based on evidence from aerial photographs and any contextual or supplementary sources. Attribute data, comprising the Monument UID and Parish Code was attached to each object, to ensure full linkage between the mapping and the records.

Migration of mapping and records from the standalone HER to the main HER will take place as part of the HER's forthcoming annual service visit from Exegesis (expected to occur within the next couple of months). They will then become accessible via the HER and the Heritage Gateway; SHER has also recently made its records available online via the Suffolk Heritage Explorer website (https://heritage.suffolk.gov.uk/). Data will be supplied to the NRHE upon request, once a suitable migration mechanism is in place.

One of the many impetuses for the project was the threat to the historic environment of those areas under greatest pressure from development, such as the Great Yarmouth and Lowestoft Enterprise Zone. The resulting mapping and associated HBSMR records will provide baseline archaeological data for strategic planning and development control purposes within Suffolk. Potential candidates for designation or other forms of management or heritage protection identified by the project team are listed in Appendix 1 of this report.

The methodology of the project is described in more detail in Appendix 2.

# 2. The Character of the Project Area

The project area included Lowestoft and its hinterland (Fig. 1.1), as well as the villages of Blundeston, Kessingland, Wrentham and Reydon, and covered an area of 118.25 sq km, approximately 3% of the total area of Suffolk.

The topography of the project area ranges from the relatively elevated, light and fertile loam soils of the 'island' or peninsula of Lothingland, to the interspersed sandy, acid heathland soils and chalky till of the Suffolk coastal hinterland. It encompasses a number of watercourses and areas of low-lying marshland, principally the Oulton Marshes on the Suffolk side of the River Waveney, Oulton Broad and Lake Lothing, and the Hundred Dyke bordered by Kessingland and Beachfarm Marshes. There are a number of urban and semi-urban areas, dominated by Lowestoft. The A12, a major regional trunk road, cuts through the southern portion of the project area from northeast to southwest.

With an estimated population of 58,560 in 2010 (Waveney District Council 2014), Lowestoft is the largest urban area in the Waveney district of Suffolk. It is a regional centre for employment, tourism and culture and is the easternmost town in England. The town is divided in two by Lake Lothing which forms Lowestoft Harbour and provides access via Oulton Broad and Oulton Dyke to the River Waveney and the Broads. Lowestoft is mainly low lying, although with areas of steep hills in the north of the town where the highest points are 20–30m above sea level. The underlying rock is crag-sand with overlying sand and glacial till deposits with gravel, with the crag being exposed at coastal cliffs, such as at Pakefield. Areas around Lake Lothing feature alluvium silt and some marshland remains west of Oulton Broad.

## 2.1 Landscape Character, Geology and Soils

The project area demonstrates considerable variation in its landscape character, land use, geology and soils (Fig. 2.1), all of which are discussed in more detail below. It encompasses the urban core of Lowestoft, its suburbs and a large rural hinterland, including the lighter soils of the river valleys, as well as marshland, heathland and wooded areas. To the south, along the A12 corridor, lie areas of open arable farmland, parkland and woodland within the Sandlings area and on the edge of the claylands plateau of north Suffolk.

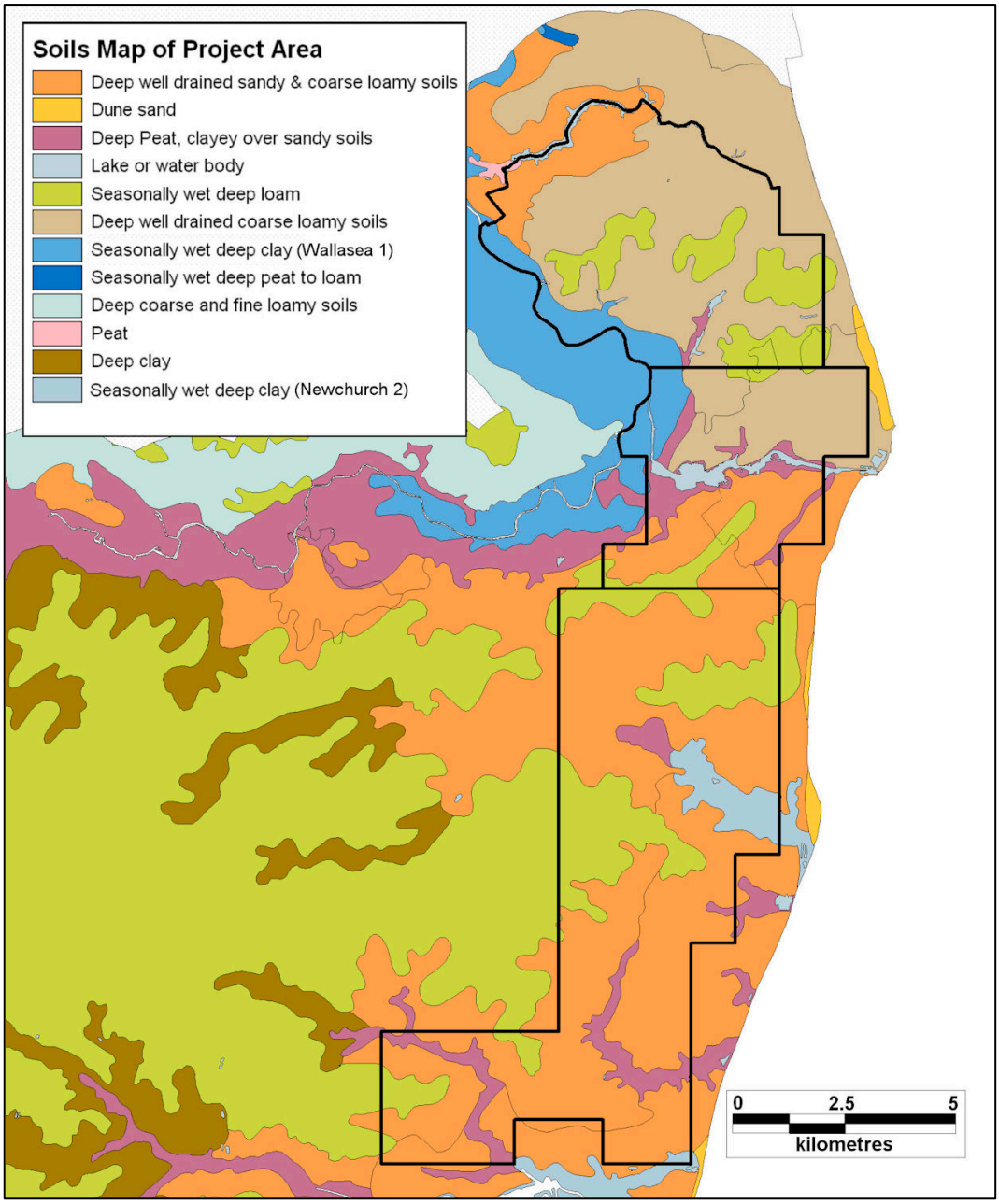


**Figure 2.1. The soils of the project area. Soils data © Cranfield University (NSRI) and for the Controller of HMSO 2015.**

## 2.1.1 Lothingland Study Area (32.75 sq km)

The Lothingland Study Area (Fig. 2.2) covered the southern part of Lothingland, stretching from Fritton Decoy – which delineates the Norfolk/Suffolk border – to Lowestoft. The land is predominantly arable, apart from Somerleyton Hall and Park, and includes the settlements of Blundeston and Somerleyton. The western margins of the Study Area included the Haddiscoe and Somerleyton marshes bordering onto the Waveney Valley and the Broads. To the east it extended as

far as the previously mapped Suffolk Coast NMP project area (EH Project 2912). The underlying geology of the area is predominantly glaciofluvial and aeolian drift and till. The light and fertile loam soils of the area, combined with arable cultivation, resulted in high numbers of cropmarks.

**Figure 2.2. The landscape of Lothingland, comprising arable fields with cropmarks showing, scattered remnants of former common land, and the wooded fringes of Fritton Decoy. Photograph © Norfolk County Council BKS 9005 (NCC 2185) 06-AUG-1988.**

### 2.1.2 Greater Lowestoft (22.5 sq km)

The Lowestoft Study Area consisted of the coastal town and modern suburbs of Lowestoft, although much of the historic urban core and harbour area had already been covered by the Suffolk Coast NMP (EH Project 2912). The western extent of the Greater Lowestoft Study Area was bordered by the Oulton Marshes and the previously mapped Waveney Valley ALSF NMP block (EH Project 3987). To the east it extended as far as the previously mapped Suffolk Coast NMP project area (EH Project 2912). The Study Area is bisected by the former peat cuttings of Lake Lothing and Oulton Broad. The underlying geology in the northern half of the area is glaciofluvial and aeolian drift and till, and in the southern half predominantly glaciofluvial drift and chalky till.

### 2.1.3 SC&H AONB (63 sq km)

The AONB Study Area is predominantly made up of land which forms the northern part of the SC&H AONB. Only relatively few areas of coastal heath remain within the project area; heaths are more characteristic of the southerly parts of the AONB.

The remainder of the project area comprised largely arable land, bisected by the valleys of a number of watercourses, the most significant being the Hundred River. There are several areas of parkland, most notably Henham Park and Benacre Park, and small areas of woodland. The Study Area was defined by the limits of the Suffolk Coast NMP (EH Project 2912) to the east and south. The underlying geology is predominantly glaciofluvial drift and chalky till, with fen peat, river and marine alluvium in the river valleys.

# 3. Factors Affecting the Results of the Survey

As is the case with any archaeological survey, the results of the Lothingland, Greater Lowestoft and North Suffolk Coast and Heaths 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 sites recorded in different environments and under different conditions and these factors need to be borne in mind when interpreting the project results.

## 3.1 NMP Methodology

The comprehensive analytical and interpretative aerial photographic survey provided by the NMP methodology makes an essential contribution to the understanding and protection of the historic environment of any area it covers. It advocates the systematic use of all available aerial photographs to map and record all visible new and previously known sites, irrespective of their present-day survival and encompassing every period from the Neolithic to the Cold War. While some aerial photographic transcription of specific sites had been undertaken prior to the start of the project – usually under the auspices of commercially-funded projects undertaken in advance of development – for the most part such work has not made use of the full range of sources typically consulted for projects using NMP standards. This means that new sites, and new information about previously recorded sites, were recorded even in parts of the project area, such as Somerleyton Park and Bloodmoor Hill, that had already been subject to intensive archaeological investigation. Across the project area as a whole, the NMP survey was the first time that much of the historic, non-specialist photography had been consulted for archaeological purposes. Even specialist archaeological photographs, from which heritage sites had already been recorded, benefitted from re-examination, with new features and sites being recognised, and existing interpretations being reappraised.

The NMP's use of historical aerial photographs is also of great benefit, in particular in the eastern region, across much of which industrial-scale agriculture has left few surviving earthworks. Such plough-levelled sites may be recorded as

soilmarks or cropmarks, or in some cases on 1940s (and sometimes later) photographs as earthworks that were subsequently levelled. The use of historic photographs is also beneficial in that they record landscape change across a timespan of approximately 70 years or more. The systematic assessment of all available aerial photographs for a particular site often allows for an assessment of monument condition and survival to be made, in particular when the most recent vertical coverage – usually Google Earth imagery – is utilised. It also allows sites to be recognised in areas now obscured by post-war development; a particular benefit in the Greater Lowestoft area.

One of the key strengths of the NMP methodology, as opposed to more piecemeal or site-oriented aerial photographic surveys, is the large size of the areas investigated. This landscape-scale approach allows sites to be studied and understood within their wider context. The production of synthetic and thematic accounts to accompany the mapping adds value to the process and allows newly created data to be more easily understood and disseminated. Through the identification of dominant themes and characteristics within the data, and more specifically through the recognition of significance and survival, the approach allows the results to feed into and inform strategies and decisions regarding heritage protection, relating to designation, planning or landscape management, for example.

Further details of the project methodology are given Appendix 2; national standards and guidance for NMP can be found in Winton (2012) and English Heritage (2012).

## 3.2 Geology and Soils

The geology, soils and topographic formation of any geographical area all have a direct impact on the efficacy of using aerial photographs to record the historic environment, especially in arable areas, where sites predominantly consist of sub-surface remains. The influence of the timing and processes of aerial photography, and resultant aerial photograph archive, are discussed separately below (Section 3.4).

The complex and varied processes and conditions which lead to differential crop growth are described in detail elsewhere (*e.g.* Wilson 2000, 67–86). Within the project area, where the underlying geology is Crag, the overlying soils were a

more significant factor. In general cropmark formation tends to be most prolific over light, freely draining soils over sands and gravels, where the soil-moisture deficit has the most rapid and pronounced effect on the overlying crops. For example, prior to the start of the project the free-draining loams of the Lothingland Study Area were known to support a high potential for cropmark sites, and this is clearly borne out by the project results. Although the extremely high density of sites and features visible as cropmarks in the northern, Norfolk portion of Lothingland (mapped as part of EH Project 2913; Albone *et al.* 2007a, *e.g.* fig. 7.10), was not matched, extensive cropmarks were visible across almost the whole of the Lothingland Study Area, often extending for several kilometres (Fig. 3.1). On the sandy soils of the glaciofluvial drift and chalky till which lies to the south of Lowestoft, the cropmark sites gradually become less extensive and more dispersed, increasingly so towards the southern end of the project area. There are also notable gaps on the clayey soils of the Beccles 1 chalky till; they are, for obvious reasons, scarce within the environs of Lowestoft. It should be noted that the distribution just described, and shown in Figure 3.1, includes soilmarks and well as cropmarks, as the index terms for Evidence Type in the SHER do not distinguish between the two (both are indexed as 'Cropmarks'); however, the number of soilmark sites recorded will have been in the minority, and the same sites are often visible as cropmarks as well, or accompanied by other cropmarks, so it is unlikely that this fact has had a significant impact on the distribution map.

The distribution of earthwork sites, whether levelled or extant, is more even, with a comparative scarcity of sites in parts of Lothingland and much larger number of sites in Lowestoft (Fig. 3.2). Many of the earthwork sites relate to 20th-century military defences; once these are excluded, the distribution is dominated by the extensive sites in Lothingland, with very few sites recorded in the southernmost part of the project area. There is no obvious correlation of earthwork sites with soils. This distribution, which is contrary to what was anticipated prior to the start of the project, is discussed in greater detail in Section 7, along with the relative survival of earthwork sites. It should be noted, however, that the small number of sites involved (163 earthwork/levelled earthwork sites recorded overall, 55 of pre 20th-century or unknown date), and the relatively small project area, mean that any resultant distribution map may not be representative of either eastern Suffolk or the SC&H AONB.

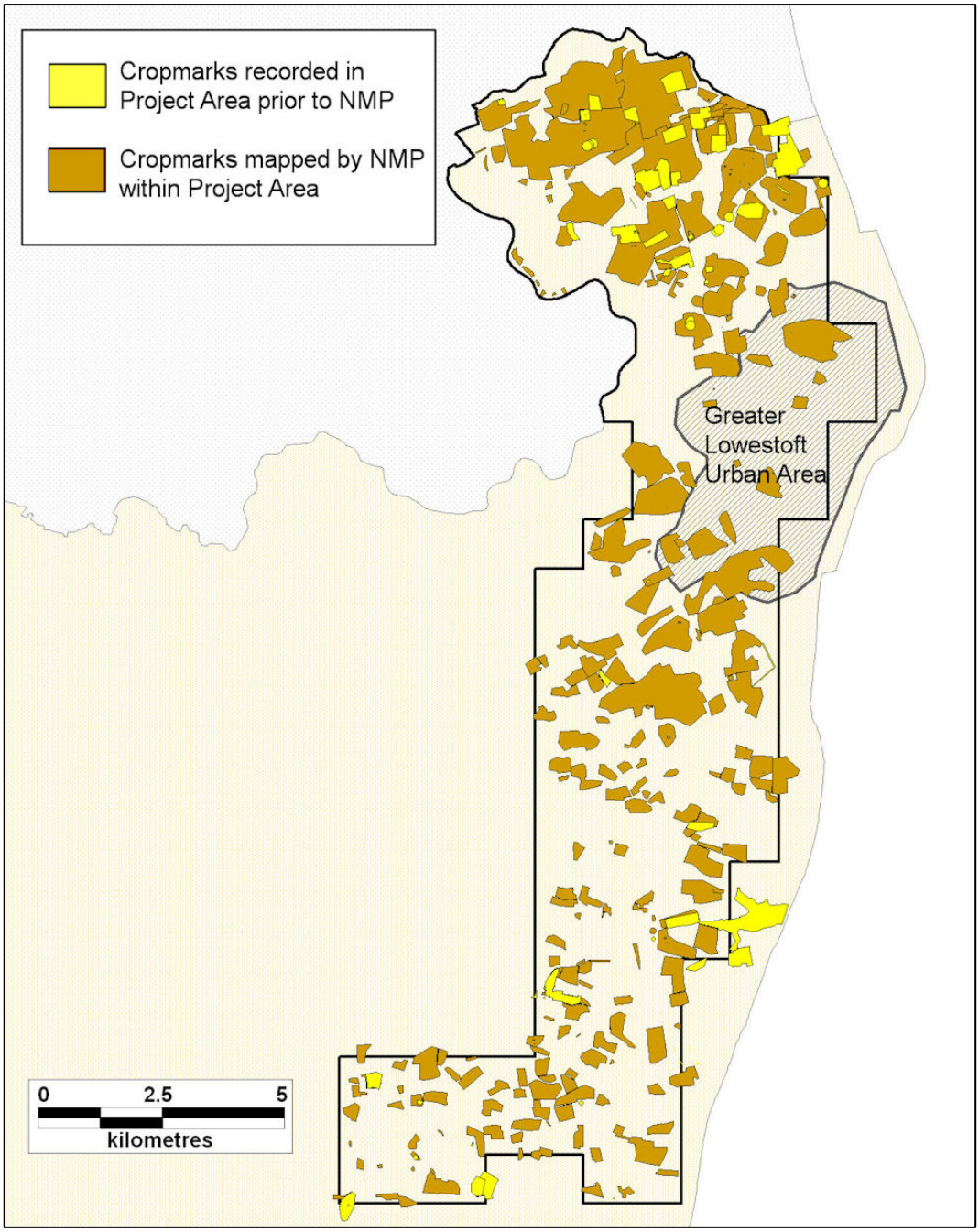


**Figure 3.1. The distribution of cropmark/soilmark sites mapped by the project.**

## 3.3 Topography and Land Use

The topography of an area and its land use (which are often related) can both have a significant impact upon the existence, survival and visibility of archaeological sites. Some topographic and/or land use settings will have been preferred or avoided in the past, for settlement, burial or land division, for example. Alluvial deposits within valleys, and undisturbed heathland vegetation, pasture or parkland can favour the survival of sites, while sites on light arable

soils and exposed hilltops and ridges may be more affected by ploughing. In terms of visibility, the alluvial deposits protecting valley sites may also mask them, making them impossible to detect using conventional aerial photography, while ploughing may make sites visible as cropmarks or soilmarks, under the right conditions.

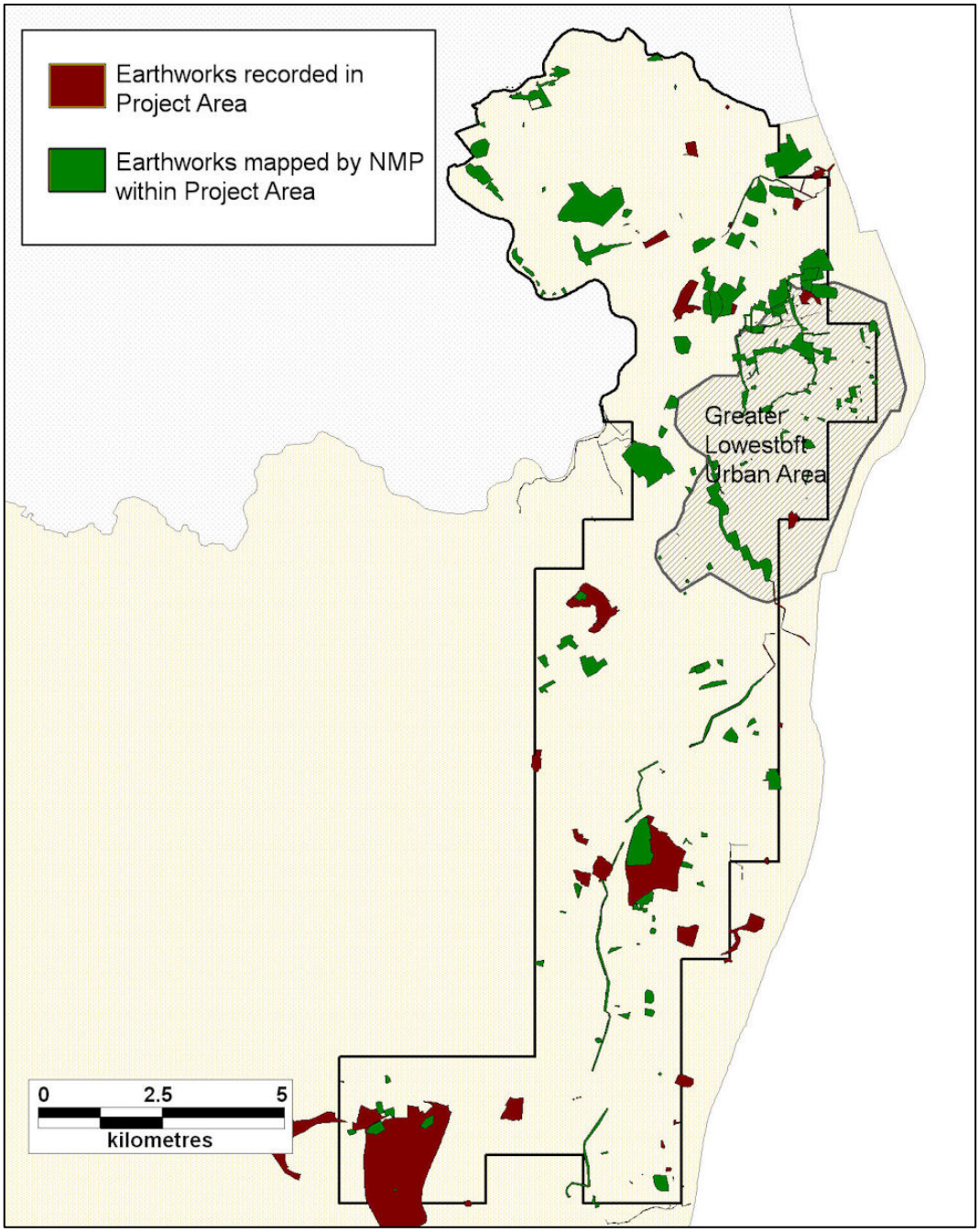


**Figure 3.2. The distribution of earthwork/levelled earthwork sites mapped by the project.**

As with all NMP surveys, all these processes are likely to have affected the results of the project. One notable area affected during the current project was the accuracy of the mapping in areas where there had been substantial changes in land use and boundaries in the post-war period. In comparison to mapping in Norfolk, relatively few accurate digitised historic maps were available for use by the project team, making the rectification of historic photos in such areas extremely difficult. The suburbs of Lowestoft were particularly problematic, due to the scale of change since the 1940s, and also because not only modern maps but the modern contour data was effectively useless for rectifying early photos. As a consequence, the mapping for these areas is likely to be less accurate that would be usual for NMP.

Another aspect where topography and land use have influenced results is again in Lowestoft and its environs, where the historic core and post-war development have masked and/or destroyed underlying archaeological sites, but its significance as a port and naval base during World War Two furnished it with a wealth of 20th-century defences, elements of which still survive. Here, the NMP's use of historic aerial photographs has been of particular value, as it has been possible to map cropmarks and earthworks visible in the 1940s and '50s and subsequently built over without any archaeological record being made.

The project recorded few sites within the base of river valleys, presumably because they were not favoured for settlement or other uses leading to the preservation of archaeological features, but perhaps also due to masking of sites by alluvium. Of those sites that were recorded many relate to 20th-century defences. The project area contains little heathland, and certainly none of any great extent. This contrasts with the more extensive tracts of heathland (both former and extant) within the central and southern parts of the SC&H AONB to the south. At a few sites heathland may have played a role in both attracting past activity and conserving its remaining traces. For example, World War Two military activity was often sited on areas of heathland, as they provided open areas for training which were not already in use for agriculture. In Lothingland this is evident on the fringes of Fritton Decoy (SOL 041), an expanse of water surrounded by heathland, scrub and plantations, which was used as a military training area (the training included floating tanks across the water). Traces of this site still survive. Nearby, a long curvilinear boundary ditch, of unknown date but associated with multiphase enclosures and field systems of potential prehistoric

and/or Roman date (ASY 002), is visible as an earthwork on 1950s aerial photographs. Parts of this too may still survive above ground, on land shown to be warren and/or common on Hodskinson's 1783 Map of Suffolk.

Parkland has perhaps had a bigger influence on site survival and visibility within the project area. Like heathland, parkland can preserve earthwork remains from plough damage. Earthworks were recorded in all three of the major areas of historic parkland recorded within the project area: Henham Park, Benacre Park and Somerleyton Park. Those at Somerleyton Park (SOL 015) were notable in that some of the earthworks had not been recorded previously, despite the site having been the subject of a substantial survey (Williamson & Taigel 1993). The earthworks of what are probably medieval to post medieval boundaries and enclosures, some depicted on an estate map of 1652 and pre-dating the expansion of the park, were visible on lidar data from a survey flown in 2009 and are likely to still survive above ground (Fig. 4.7).

The relative survival of earthwork sites across the project area is discussed further in Section 7.

## 3.4 Aerial Reconnaissance, Photo Coverage and Interpretation

The date, distribution and density of aerial photographs has a significant impact upon the results of any NMP project. The project consulted several photographic collections in order to ensure the best possible photographic coverage, but coverage was not even across the project area.

Most of the photographs consulted were vertical photographs, and included surveys by the RAF and Ordnance Survey, and the photo mosaics on Google Earth. These sources provide large area cover but most were taken for non-archaeological purposes and so were not always taken in optimal conditions for the study of the historic environment. There were very high volumes of vertical photographs for the Lowestoft area in particular, and this caused some problems in terms of the time required to review such large numbers of frames. However, it was also of benefit because of the large date range covered, and the frequency of surveys during that period, which offered multiple opportunities to observe and record sites under a variety of conditions, often over a period of at least 70 years.

The specialist oblique collections mainly provided good quality archaeologically focussed site-based aerial photographs. As with any source, the archaeological record derived from oblique aerial photographs depends on a number of factors. Results can be affected both by the visibility of sites from the air (for example, ground conditions affecting the formation of cropmarks), and whether or not what is visible is seen or recorded (dependent on weather conditions or the experience of the photographer/observer, for example).

The number of available photographs does not, therefore, necessarily correlate with 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 unsuitable time of day or year. In practice, however, the quantity of photographs of a given area will in general be translated into a greater or lesser number of archaeological sites being recorded, and may also affect the amount of detail recorded at each site. This is particularly the case for sites visible as cropmarks, which are highly dependent on the right ground conditions and crop growth for their formation and visibility.

In terms of the date of photography, the Lowestoft Study Area was the only area for which pre-World War Two photographs were available. The limited nature of photographic coverage pre-dating 1940 presented problems in identifying World War One sites, reflected in the very small number of sites recorded (Section 4.9). Conversely, while the use of historic aerial photographs, and particularly those from the 1940s, allowed a wealth of World War Two defences and other military installations to be recorded, the visibility of such sites was affected by the fact that a significant number were housed in requisitioned buildings. For example, Southwold, Reydon, Benacre and Covehithe churches, several windmills and a water tower on the Benacre estate were used as observation points for field artillery (Liddiard and Sims 2014a, 38). Similarly, in Lowestoft fish merchants' premises, hotels, schools and private houses were all requisitioned for military use or to provide accommodation for troops. Without any external indication of their military use (defences, vehicles, camouflage, *etc.*), such sites are essentially unidentifiable using the aerial photographic evidence alone.

# 4. Summary of Archaeological Results

## 4.1 Overall results

The project created 465 new sites in the SHER and amended 133 existing records. Although the 'new' records include a small proportion of previously recorded sites that were split into separate elements and renumbered, this still represents a very significant number of archaeological sites and landscapes recorded for the first time. Prior to the project starting the SHER had mapped 671 sites within the project area. The project results therefore represent a 69% increase to this record.

The results vary across the project's study areas, in terms of the number of sites recorded, their density and the percentage increase to the SHER (see table below). The greatest density of sites was recorded in Lowestoft (6.7 per sq km), an area that also saw the greatest increase to the HER (148%). This is undoubtedly a reflection of the high density of World War Two defences and military sites visible within and around the town. By contrast, the Lothingland Study Area recorded a relatively low percentage increase to the HER (48%), and a fairly low density of NMP sites (5.5 per sq km), which is at odds with the 'busy-ness' and complexity of the mapping. This reflects the extensive nature of many of the Lothingland sites, and the fact that a high proportion of the sites were very large, incorporating numerous features. Thus despite the density of mapped features in the Lothingland Study Area, these were recorded as a relatively small number of sites.

| **Study Area** | **Area (sq km)** | **Existing SHER Records (mapped)** | **Total NMP Records** | **New NMP Records** | **Amended NMP Records** | **Increase to SHER** | **NMP Site Density** |
|---|---|---|---|---|---|---|---|
| Lothingland | 32.75 | 227 | 179 | 110 | 69 | 48% | 5.5 per sq km |
| Greater Lowestoft | 22.5 | 96 | 151 | 142 | 9 | 148% | 6.7 per sq km |
| North SC&H AONB | 63 | 348 | 269 | 213 | 56 | 61% | 4.3 per sq km |
| **Project Overall** | **118.25** | **671** | **598** | **465** | **133** | **69%** | **5.1 per sq km** |

For sites recorded within the NRHE (formerly the National Monument Record) the increase is even more striking. At the start of the project, the project area contained 242 NRHE monument records, of which only 22 correlate with a site recorded by the project. Across the project area, therefore, a total of 576 new NRHE sites have been recorded, equating to an increase of 238%.

Unless otherwise stated, the sites referred to in the text relate to parish codes in the SHER (*e.g.* BLN 029). Those with the prefix 'NHER' relate to records in the Norfolk Historic Environment Record.

## 4.2 Neolithic Sites (4000–2351 BC)

As is typical of the aerial photographic evidence for this period, including that from Norfolk's coastal mapping (Albone *et al.* 2007a), the assemblage is dominated by 'monuments', *i.e.* funerary and/or ceremonial sites. Only two sites, situated beside a tributary in the Waveney Valley, have been assigned an exclusively possible Neolithic date. Both have been interpreted as possible funerary sites. They comprise the cropmarks of an oval ring ditch or sub-rectangular enclosure, potentially representing the remains of a Neolithic oval barrow and/or 'mortuary enclosure' (BLN 029), and a second possible oval barrow or enclosure (FTN 002).

A further 42 sites were considered to contain a possible Neolithic element, at least six of which may represent the remains of a Neolithic and/or Bronze Age round barrow or hengiform monument (BLN 004, BLN 026, BLN 028, BLN 031, LUD 042 and LUD 059), and two of which (BLN 028 and BLN 031) were located in close proximity to Neolithic finds. However the vast majority of these 42 sites, many of which relate to possible field systems, were dated only broadly to the 'later prehistoric' period (4000 BC to 42 AD), and it is likely that only a few actually date to the Neolithic period.

## 4.3 Bronze Age Sites (2350–701 BC)

A total of 110 ring ditches was recorded; it was felt that the majority of these (at least 74) represented the remains of plough-levelled Bronze Age round barrows. Possible or clear evidence of an earthwork mound was recorded at four sites (SOL 004, CAC 010, LUD 009 and LUD 045), but it would appear that the vast majority of sites are now plough-levelled.

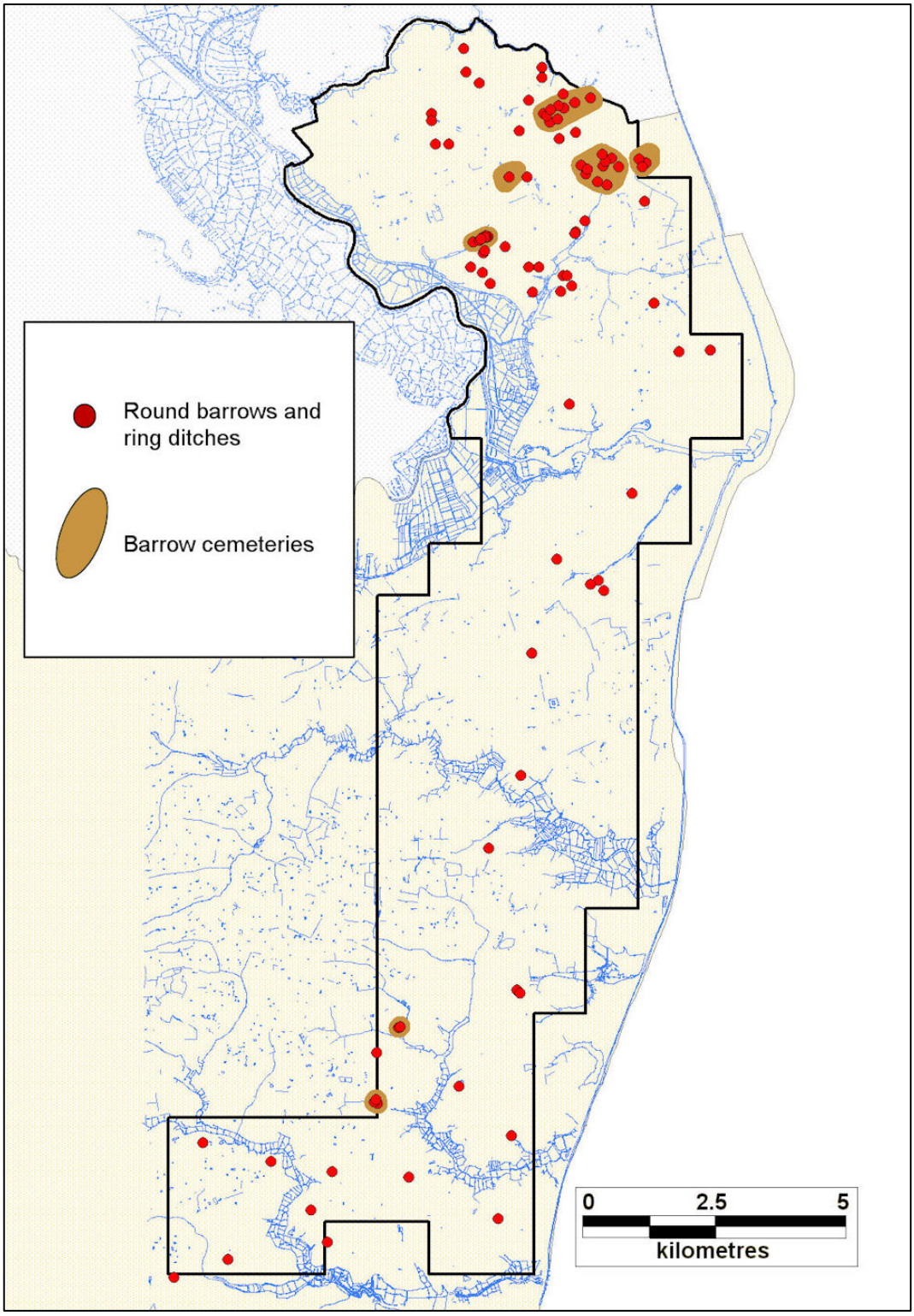


**Figure 4.1. The distribution of ring ditches, round barrows and barrow cemeteries of known or postulated Bronze Age date recorded by the project, shown in relation to watercourses.**

The majority of the possible round barrows (61 of 74, or 82%) are located in the Lothingland Study Area, on deep well-drained loamy soils above glaciofluvial and aeolian drift geology. These soils are particularly conducive to the formation of

cropmarks, and therefore the distribution of the sites is likely to be affected significantly by issues of visibility. There are many fewer cropmark sites in general on the glaciofluvial drift and chalky till to the south of Lowestoft.

The landscape setting of the ring ditches is relatively varied, but there appears to be a preference for a slight or moderate slope and for sites to be positioned on valley sides (Fig. 4.1). Previous studies of the distribution of round barrows in Suffolk have demonstrated a close correspondence with areas of lighter soil; the Sandlings in southeast Suffolk, along with Breckland in the northwest and the major river valleys being areas in which they appear most densely located (Dymond & Martin 1999, 38).

A total of eleven barrow cemeteries was recorded within the project area. For the purposes of the project, barrow cemeteries were broadly defined as being groups of three or more barrows or ring ditches with an obvious spatial relationship or clustering, such as a nucleated group or linear arrangement. The cemeteries recorded in the project area each contains between three and seven individual barrows or ring ditches. One large example at Somerleyton (SOL 045) comprises at least seven individual ring ditches (SOL 003–005, 012–013, and 046–047), arranged in an eastnortheast to westsouthwest alignment. This mirrors the alignment of a tributary of the River Waveney which lies 100m to the southwest. A second cemetery at Lound (LUD 072) is probably even larger, with up to thirteen possible barrows, although the size of some, and their siting within an area of field systems and enclosures means they could instead be roundhouses (Fig. 4.2). The location of these cemeteries on the valley sides overlooking minor tributaries leading into the main river valleys, as at both examples described above, reflects a pattern already identified for other barrow groups located around the Broadland river network (Albone *et al*. 2007b, 21). The LUD 072 group also contains a penannular or 'C'-shaped monument (LUD 042; Fig. 5.9), similar to examples identified in Norfolk from aerial photographs (Albone *et al*. 2007a, 40–41) and which are evident on aerial photographs from elsewhere. Their usual context appears to be within a Neolithic to Bronze funerary and/or ceremonial landscape. As with other examples, the site at Lound may represent a type of later Neolithic or Early Bronze Age hengiform monument or an elaborate form of funerary monument, but appears to form part of a relatively uncommon and little-studied group of features.

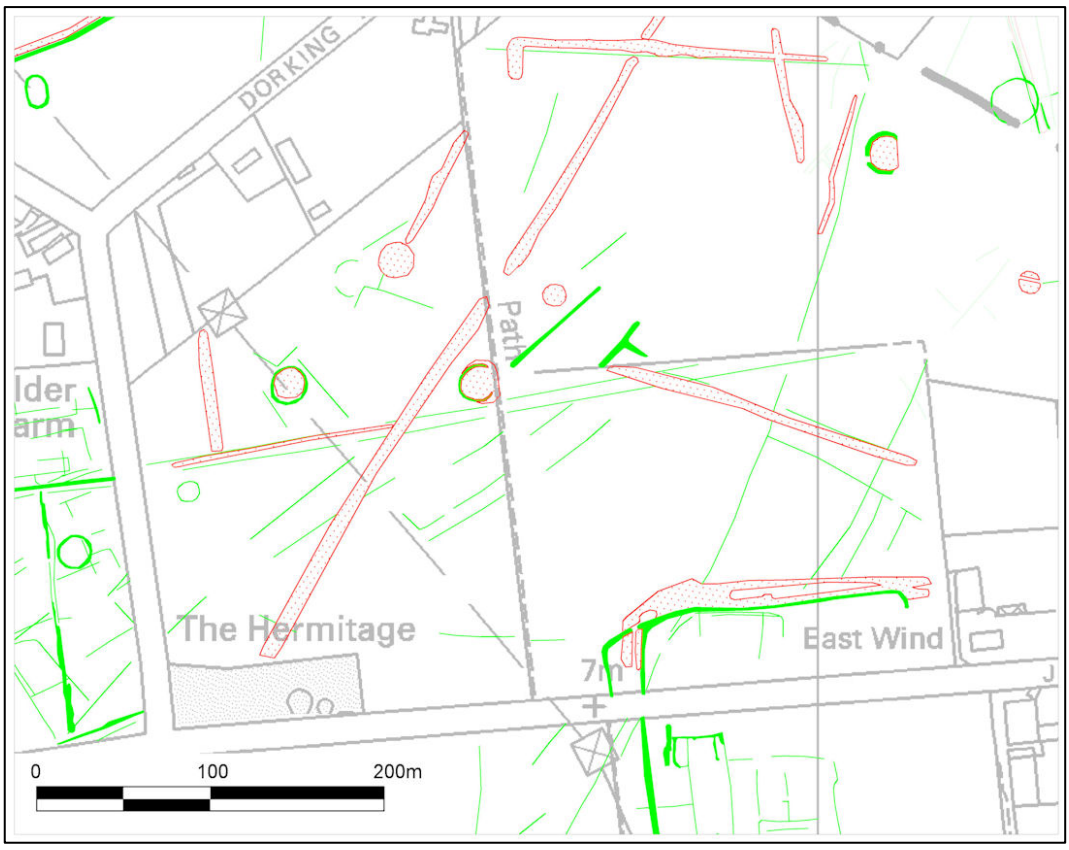


**Figure 4.2. Mapping of the eastern part of the large barrow cemetery at Lound (LUD 072);soilmark evidence of barrow mounds (LUD 046) is visible on historical aerial photographs of the former area of Lound Green.**

Of the 132 sites recorded by the project as having a possible, likely or known Bronze Age date (of which only 88 have been given an 'exclusively' Bronze Age date), the majority are likely to have been funerary in nature. Non-funerary or domestic sites of this period have been harder to identify. While thirteen sites recorded as possible field systems contain a possible Bronze Age element, this class of site is notoriously difficult to date (Section 5), and many of the field systems and enclosures recorded by the project have been recorded with a Neolithic to Roman and/or medieval to post medieval date, rather than anything more precise. As discussed below (Section 5), there is increasing excavation evidence from Suffolk and elsewhere for rectilinear and sub-rectangular enclosures of Middle Bronze Age date, for example Fordham Road, Newmarket (NKT 047; Rees 2014). Although some attempts have been made to identify a 'signature' for these sites and to recognise them from cropmarks alone (Gilmour *et al*. 2014), such efforts require secure physical dating evidence to confirm or refute a Middle Bronze Age date. Although 28 enclosures recorded by the project have been tentatively given a possible Bronze Age date, only two were considered to be definitely or exclusively of this date, both circular enclosures

which may instead represent former round barrow sites. Examples such as a group of conjoined enclosures at Lound (LUD 055), which seemingly underlie a Roman and/or medieval field system (LUD 016), could feasibly represent enclosures of Middle Bronze Age date, but in this instance an Iron Age date is also considered likely.

## 4.4 Iron Age Sites (800 BC–AD 42)

The problems of distinguishing between later prehistoric, Iron Age and Roman domestic enclosures and agricultural landscapes has been discussed in detail elsewhere in other NMP reports (for example Albone *et al*. 2007a). Of the 132 sites recorded by the project as possibly containing an Iron Age element, none is thought to be secure and exclusively of Iron Age date. Most are recorded with a broad later prehistoric date. The fact that Iron Age settlement in Suffolk is thought to have mainly consisted of unenclosed settlement (Dymond & Martin 1999, 40) may account for this lack of 'visibility' of distinctive features recognisable from air photos, such as enclosures.

In terms of their morphology, a number of the enclosures recorded by the project could be Iron Age in date; they compare well with those previously identified by the Suffolk Coast NMP Project (Hegarty & Newsome 2005, 36), the Suffolk ALSF NMP project (Hegarty 2010, 25), and also those recorded as part of the Essex NMP, that have been proved by excavation to be Iron Age in date (Ingle & Saunders 2011, 64). Potential examples of enclosures of this date are the trapezoidal/sub-rectangular enclosure (SOL 016) to the south of a coaxial field system at Lound, and another nearby with internal sub-divisions in Blundeston (BLN 030). As discussed below in relation to field systems (Section 5), a significant number of the field systems recorded within the project area may be wholly or partly Iron Age in date, but using aerial photographs alone it is extremely hard to distinguish these from those dating to other periods.

## 4.5 Roman Period Sites (AD 43–409)

A total of 72 sites were recorded by the project as containing elements of Roman or possible Roman date; only 34 of these were recorded as possibly containing elements of solely Roman date, as opposed to a broader late prehistoric to Roman or Iron Age to Roman date. The majority of the sites are cropmarks of

enclosures, possible farmsteads and field systems. As mentioned above, dating sites of this type is problematic, and many sites could have been in use as early as the Bronze Age, and remained in use into the Anglo-Saxon and medieval periods. Field systems of possible Roman date are discussed in greater detail in Section 5.

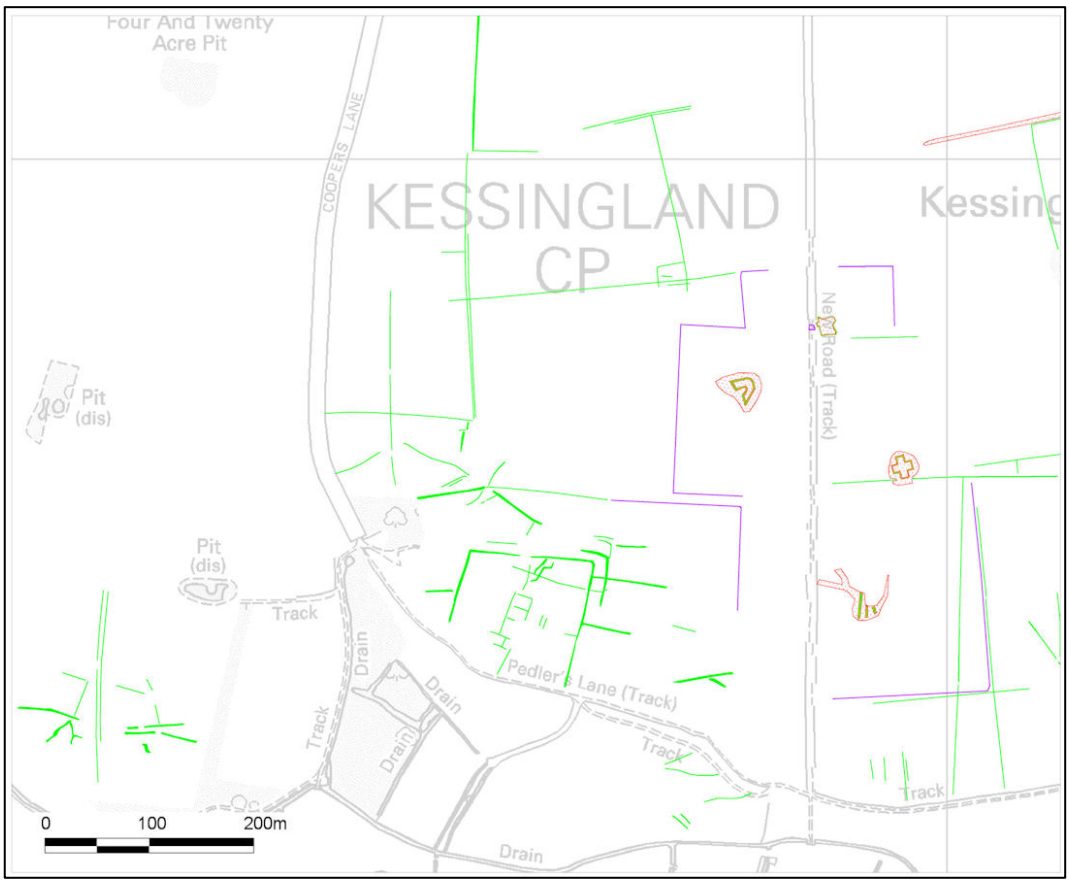


**Figure 4.3. The site of a possible Roman villa at Kessingland (KSS 090). Also visible is a group of World War Two earth-covered bunkers, slit trenches and defensive positions, surrounded by barbed wire obstructions (shown in magenta) (KSS 093).**

The sites consist mainly of rectilinear, rectangular and trapezoidal enclosures and field boundaries, and in most cases they could not positively be assigned a solely Roman date. Four Roman period sites were recorded as possible farmsteads or settlements (LUD 006, LUD 016, SOL 016 and SOL 035). At least one probable Roman villa was identified (KSS 090, Fig. 4.3), surrounded by elements of a possible Romano-British field system (KSS 091–092), located at Kessingland within the AONB Study Area. A Roman date was suggested for the large double-ditched enclosure due to the recovery of Roman tile from the site (KSS 011 and KSS 013) and many other Roman finds including a horse-and-rider brooch and a disc brooch (KSS Misc). It also appears to exhibit internal

rectilinear structures, suggesting its interpretation as a villa complex. Similar villa sites have been recognised in previous NMP mapping of Norfolk, for example adjacent to the Peddars Way at Fring (NHER 1659 and 1661; Albone *et al.* 2007a). Villas are a comparatively rare discovery in this part of eastern England; within Suffolk recorded examples are more numerous on the western side of the county (Dymond & Martin 1999, 42–43), and none were recorded by the HER within the project area prior to the survey taking place. Consequently, the Kessingland site warrants further investigation and heritage protection (Appendix 1). A second villa may be represented at one of the settlement sites (SOL 035), at Somerleyton within the Lothingland Study Area, but its interpretation is less clear.

Further Roman sites where traces of possible buildings or other structures are evident include the cropmarks and soilmarks of a possible square earthen enclosure or stone-built structure of uncertain date at Blundeston (BLN 016; Fig. 5.5a). The site consists of an enclosure, 40m across, which exhibits evidence of both bank and ditch construction or feasibly some stone-built components. Internal subdivisions, a possible small circular structure or ditched feature and an angular banked or stone structure and/or platform are also apparent. Feasible interpretations include a Roman temple or watchtower and/or signal station. Possible associated boundaries and fields are also visible around the enclosure, and these, along with the enclosure itself, are not on the same alignment as the surrounding fields, but do reflect the orientation of parts of cropmarks to the north (BLN 007), which are thought to be of Roman or later date.

Lastly, the cropmarks of a possible post-built or aisled building (or buildings) of possible Roman or Anglo-Saxon date (COR 060) are visible on aerial photographs to the south of St Bartholomew's church, Corton. The possible building(s) are located within an area of enclosures and field boundaries of medieval (or possibly late Anglo-Saxon to medieval) date (COR 047). It does not share the same alignment however and may represent a different phase. The presence of Roman finds nearby (COR 004, COR 045), could suggest a Roman date, although the Anglo-Saxon activity in the area, combined with the morphology of the site, could also indicate a late Anglo-Saxon date; if the latter, a greater correspondence with the surrounding cropmarks in the area might be expected. When this building is compared with the post-built structures excavated at Bloodmoor Hill (CAC 016), which predominantly measured between

8-10m in length and 4-5m in breadth (Lucy *et al.* 2009, 102), the Corton building would appear to be much larger (up to 19m by 11.5m), and with much larger post-holes (Fig. 4.4). The Bloodmoor Hill post-built structures were seen as being typical in size and construction to other excavated Anglo-Saxon examples in East Anglia (*ibid*.). This may indicate a different, perhaps Roman or earlier date for the Corton building, or it may reflect two or more buildings being constructed in close proximity to another, or a building that is altered and augmented over time.

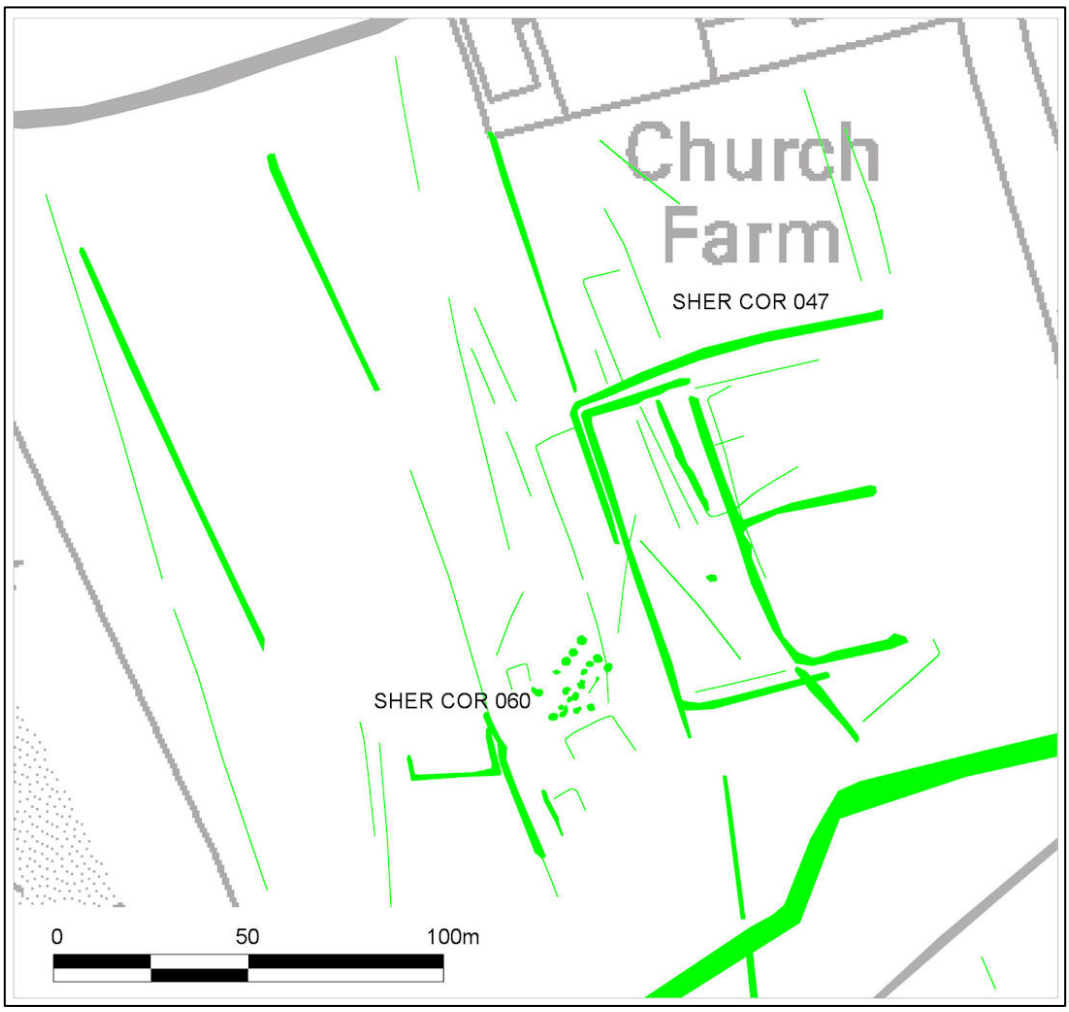


**Figure 4.4. The site of a possible post-built Roman or Anglo-Saxon building (or buildings) at Corton (COR 060)to the south of Bartholomew's church. The site is located within an area of enclosures and field boundaries (COR 047) of potential medieval (or possibly late Anglo-Saxon to medieval) date.**

## 4.6 Anglo-Saxon Sites (AD 410–1065)

Eight sites incorporating an element of possible Anglo-Saxon (early medieval) date were recorded by the project. In addition to the possible post-built structure discussed above (COR 060), which may represent a Roman or Anglo-Saxon

building, evidence of possible Anglo-Saxon buildings was recorded at two further sites. At Somerleyton, in the Lothingland Study Area, a settlement site (SOL 035) includes evidence for possible sunken featured buildings in the vicinity of Anglo-Saxon finds. Traces of similar features were also recorded at Bloodmoor Hill (CAC 080), in the Lowestoft Study Area, located in the same area as — but seemingly additional to — the excavated examples at that site. The other five sites containing a possible Anglo-Saxon element were field boundaries, enclosures and trackways that could not be dated any more closely than a broad Roman to post medieval date, and a ring ditch which could equally be of prehistoric date at Bloodmoor Hill (CAC 078).

The settlement at Bloodmoor Hill, Carlton Colville is the most significant site of Anglo-Saxon date within the project area. Here, on the outskirts of Lowestoft, excavations have revealed an extensive and complex archaeological landscape consisting of a major Roman trackway or droveway and a series of enclosures and fields, which became the focus for a substantial Anglo-Saxon settlement and cemetery (Lucy *et al.* 2009). Although little of the Roman and Anglo-Saxon settlements could be identified on the aerial photographs (see Section 5 for discussion), some of the larger sunken-featured buildings were visible as cropmarks (CAC 080).

## 4.7 Medieval Sites (AD 1066–1539)

In total 94 sites were recorded as containing components that were of possible medieval date. Nine possible moats or moated enclosures were identified, four of which (CAC 059, FTN 017, KSS 103 and WNF 052) represent potential new discoveries. Sixteen enclosures of possible medieval date were recorded, at least a quarter of these being associated with larger medieval complexes and moated sites.

A probable rectilinear structure, likely to be of medieval and/or post medieval date (SOL 049), is visible as earthworks on aerial photographs taken in the 1940s and ‘50s, situated adjacent to the medieval to post medieval manorial site of Herringfleet Hall (HRF 014; Fig. 4.5). The earthworks have since been largely or wholly levelled, the site appearing as a dark soilmark on a later aerial photograph taken in 1971. Medieval finds have been recovered from the surrounding area (HRF 009), and, as mentioned above, the manorial site of Herringfleet Hall lies to its west and south. A trackway or substantial ditch –

perhaps a hollow way – runs along the east side of the structure. Undated linear ditches in the field to the northeast (SOL 050) may be contemporary, related features. The survival of this site as an earthwork until relatively recently, and its possibly manorial context, makes it a good candidate for further work and potentially heritage protection measures (Appendix 1).

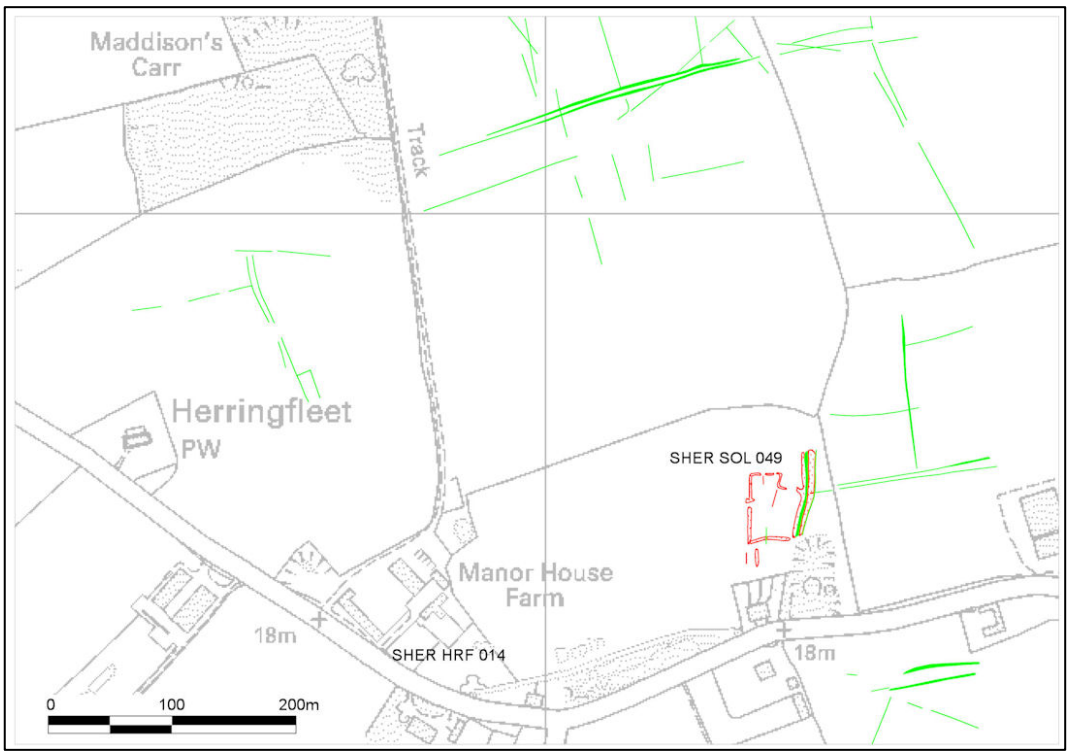


**Figure 4.5. The site of a probable rectilinear structure, formerly visible as an earthwork, of probable medieval to post medieval date (SOL 049).It is situated adjacent to the medieval to post medieval manorial site of Herringfleet Hall (HRF 014), and is surrounded by fields (for example SOL 050 and LUD 016) of Roman to medieval/post medieval date.**

Traces of possible 'deserted' medieval settlement were recorded by the project in at least three locations, one of which – ASY 010 – has been included as part of a much larger site representing settlement and fields of Roman and/or medieval date (LUD 016). The features recorded within ASY 010 could feasibly relate to a former medieval settlement, although the 1652 Estate Map of Somerleyton would indicate that much of this site was under woodland during this period and that some of the cropmarks may relate to woodland boundaries. The other two possible deserted medieval settlement sites were both recorded within areas of parkland. Within Benacre Park (BNC 001), an area of possible settlement appears to have been enclosed by the post medieval park; it includes several trackways, and a possible area of ridge and furrow within fields. Within Henham

Park (WNF 052), fragmentary earthworks may represent the site described as 'moat and earthworks of Henham village in Tuttles Wood' (HAM 005). A small portion of the earthworks visible within Benacre Park (BNC 001) appear to survive on the latest available Google Earth photography, and it is suggested that this site warrants further site survey (Appendix 1). Whilst it was not possible to be certain of earthwork survival from the available sources, this may also be true of the Henham Park earthworks (WNF 052).

The site of former earthworks of probable medieval to post medieval date (BLN 037) was visible in the grounds of Blundeston Lodge (BLN 021), now the site of Blundeston Prison. The site consists of banked and ditched boundaries, some of which may relate to agricultural activity pre-dating the Lodge. It is also feasible that some of the mounds and platforms identified relate to the sites of former structures, although this is uncertain given the lack of clarity of many of the earthworks.

It is likely that many of the other medieval enclosures recorded by the project were associated with stock management, such as the possible stock enclosures within Mutford Big Wood (MUD 025; Figs 7.1 and 7.2), and a broad boundary ditch in Somerleyton, Ashby and Herringfleet (SOL 056). Hodskinson's Map of Suffolk dating from 1783 indicates that this latter feature was located on the edge of a common and may represent a stock enclosure or encroachment onto the common, or alternatively a medieval common-edge settlement; the cropmarks were, however, indistinct and their interpretation as an archaeological feature uncertain.

It has long been accepted that the landscape of East Anglia, and in particular that of 'Northern East Anglia' (central and eastern Norfolk and northeast Suffolk), is characterised by a high frequency of medieval common-edge settlements. Such settlements were generally the product of a process known as 'common-edge drift' that took place during the 11th to 13th centuries, perhaps as a response to wider problems within the local economy (Liddiard 2008). As well as the site already described (SOL 056), a number of other possible examples of medieval common-edge settlement were mapped within the project area. They include at least part of a series of enclosures and fields at Lound (LUD 018), where Hodskinson's 1783 Map of Suffolk indicates there was common to the north of the area. Three possible sites of common-edge settlement associated with Mutford Common, as depicted on Hodskinson's map, were also recorded (MUD

023, MUD 026 and MUD 028; Fig. 4.6). Two of these (MUD 023 and MUD 026) were cropmarks and earthworks of a series of enclosures and drainage ditches alongside the common and the third (MUD 028) consists of rectilinear mounds and enclosures along with a series of banks or causeways across the damper ground. It is probable that these features relate to settlement and/or stock management alongside the common. The most recent photography visible on Google Earth indicates that some of these earthworks, most notably the mound and the northernmost embankments on site MUD 028, still survive, and the site warrants further investigation or survey (Appendix 1).

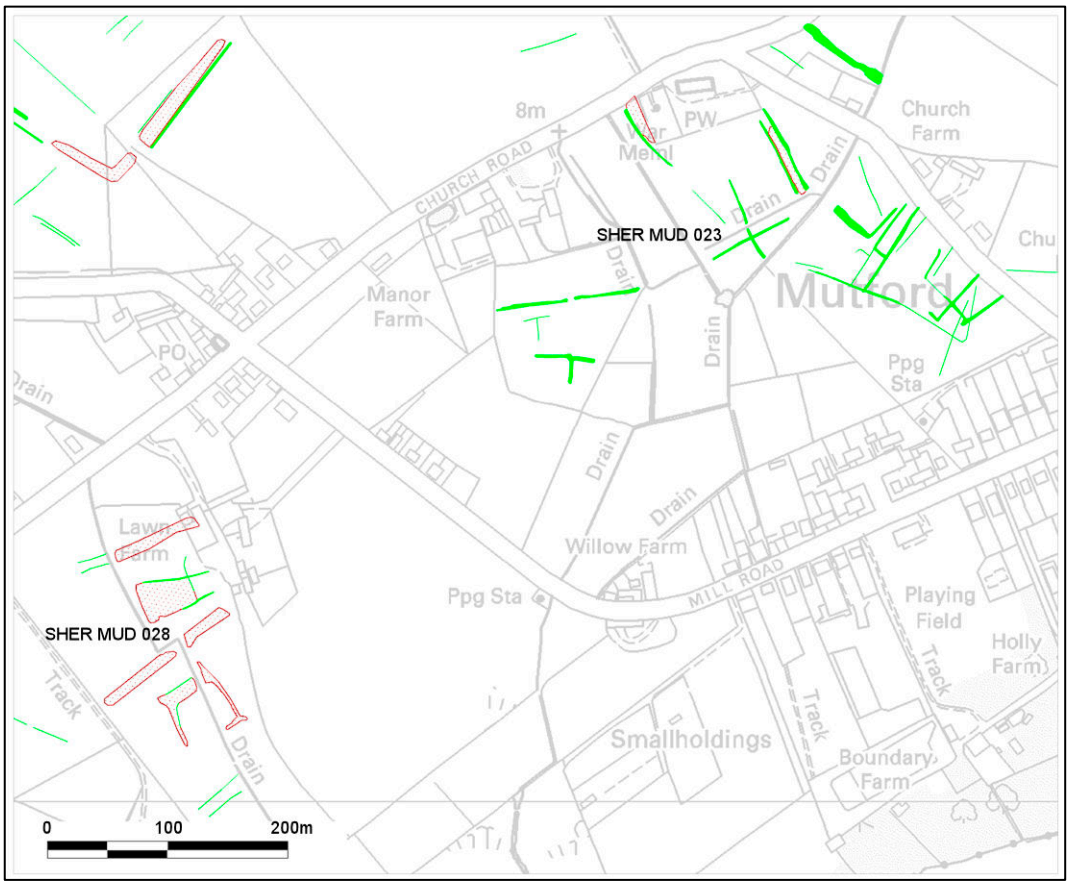


**Figure 4.6. The earthworks, soilmarks and cropmarks of probable medieval to post medieval common-edge enclosures and boundaries around former Mutford Common.**

Twenty-two field systems of probable medieval date were mapped, although many of these were dated more broadly to the medieval to post medieval period. The sites can be characterised as enclosed fields, paddocks and stock enclosures, as opposed to open field systems operating areas of ridge and furrow. The fields were commonly associated with enclosures and/or extant medieval to post medieval settlement features. Only two sites with possible

traces of ridge and furrow were identified. Ridge and furrow is not a common feature of East Anglia as a whole (Liddiard 1999, 1). It is particularly rare on the lighter soils, which were typical within the project area. Both the sites identified were in the AONB Study Area, located on clayey soils. It is probable that the heavier, poorly draining clay soils needed to be ploughed in such a way that ridge and furrow was produced, in order to assist drainage in these areas. It may also be the case that the practice was more widespread but the physical traces are now only visible where the heavier soils produced more solid and substantial features, less vulnerable to plough damage. The prevalence in East Anglia of the method known as 'stitch' or 'stetch' ploughing, which produces only low ridges and which are less evident in the archaeological record, has also been suggested as a reason for the scarcity of ridge and furrow (Martin & Satchell 2008, 31–33). It is notable that the two sites recorded by the project are both within Benacre Park, where earthworks may perhaps have been preserved for longer than elsewhere.

## 4.8 Post Medieval Sites (AD 1540–1900)

In general, post medieval field systems and boundaries were not mapped; in most cases historic maps provided comparable or superior information. Agricultural features dating to this period were usually only plotted when they formed part of a complex multi-period site, where it was hard to confidently distinguish them from earlier components or where the mapping and recording of these boundaries made the site more comprehensible and facilitated the identification of earlier cropmarks. Across the project area, 81 sites were recorded as containing elements of potentially exclusive post medieval date, but 157 sites of possible post medieval date were recorded overall. They occur across the project area, and while clusters and gaps occur in their distribution – for example, clusters to the north and south of Lowestoft – there is no clear evidence that these are of particular significance.

One site where significant new information came to light was in the Lothingland Study Area, within the bounds of Somerleyton Park (SOL 015). Undated earthworks, most probably the remains of post medieval field boundaries, tracks and roads, were visible on both aerial photographs and lidar images (SOL 015; Fig 4.7). Many appear to correspond with features depicted on an early estate map of Somerleyton dating to 1652, which pre-dates an expansion of the park to

its current southern and western extent. Some of the earthworks, several of which had been identified on the ground previously (Williamson & Taigel 1993, 54-59, fig. 18), appear to mark the original park boundary, and could have formed part of a park pale, or instead (at least in part) roads bounding the site. However, the most complex and extensive earthworks, most of which were newly recorded, were visible in the southwestern corner of the park, between Church Grove and Glebe House. These seem to represent the roads, tracks, fields and strip fields depicted in this area on the estate map. If this interpretation is correct, then they are undoubtedly early post medieval and very likely medieval in origin. As many of these features were clearly visible on lidar imagery from 2009, it is likely that they may still survive as earthworks, and they have been included in Appendix 1 as a candidate for further heritage protection measures.

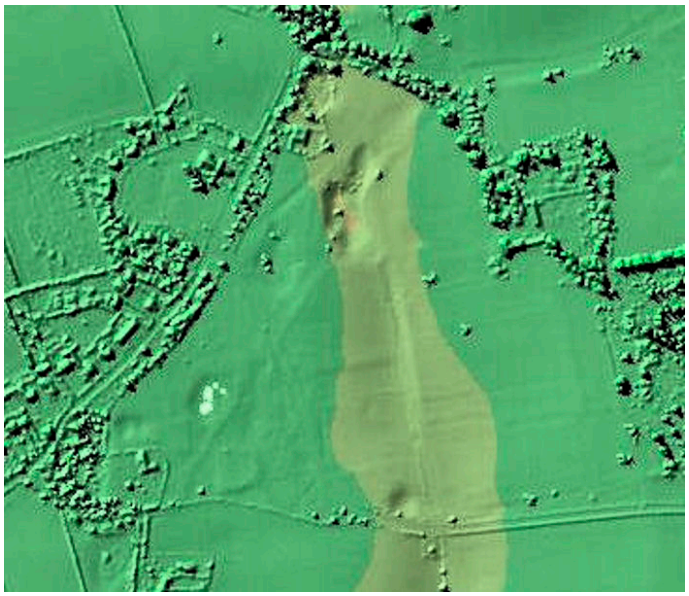

**Figure 4.7. Lidar image (with contrast enhanced) of earthworks of post medieval (probably medieval to post medieval) tracks and boundaries in the southwest corner of Somerleyton Park (SOL 015). LIDAR TM4896 Environment Agency D0111664 XX-JAN-2009 © Environment Agency copyright 2015. All rights reserved.**

Also at Somerleyton, earthworks were recorded relating to the post medieval pleasure grounds known as Summer House Water, which were in the same ownership as the park but located some 1.25km to its south (SOL 027). These too are depicted on the 1652 estate map, and several elements have been identified as surviving on the ground (Williamson & Taigel 1993; Williamson 2000, 28, fig. 13). Unfortunately only a small number of features were visible on the aerial photographs, located at the western end of the pleasure grounds (Fig. 4.8). These comprised the outline of the Wall Pond (or the 'Walled In Pond'),

possible remnants of terracing to its south, and an island within Hand Pond to its southwest. The island is the only element not previously identified on the ground; the 1652 map shows that a building once stood on it (Williamson 2000, fig. 13).

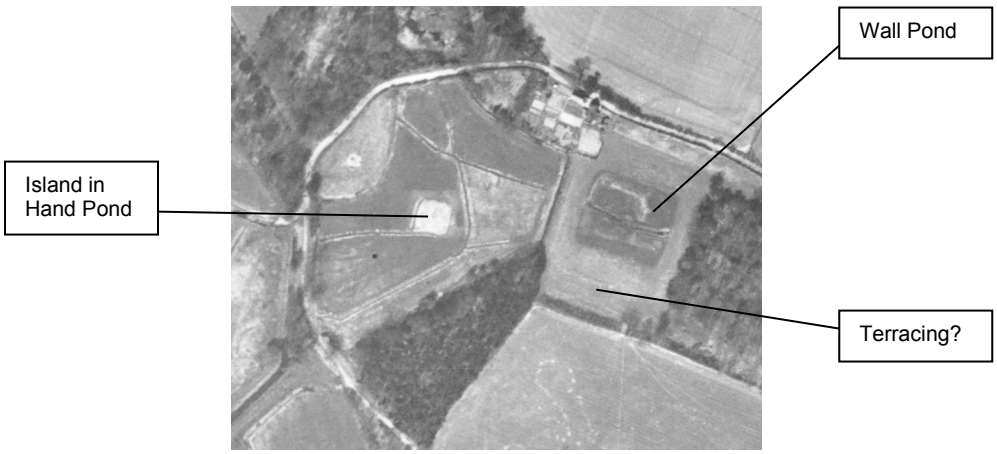


**Figure 4.8. Earthwork remains of the post medieval pleasure grounds at the western end of Summer House Water (SOL 027).RAF/540/465 RP 3120 20-APR-1951 Historic England RAF Photography.**

Also of probable post medieval date were the few inter-tidal structures recorded by the project, around the edge of Lake Lothing. These comprised hulks or wrecks and a structure possibly relating to shellfish farming (LWT 240).

## 4.9 20th-Century Military and Defensive Sites (AD 1914-91)

Over the last few decades the value of 20th-century military archaeology has increasingly been recognised, and the mapping and recording of such sites from aerial photographs is now a routine part of any NMP project. The use of historical photography, where available pre-dating the RAF National Air Survey of 1945-7, means that many features destroyed in the immediate 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 large numbers of contemporary photographs are available, providing a record of the sites when they were actually in use (or very soon after). Large numbers of such photographs were consulted for the project area, concentrated particularly on the coastal fringes and Lowestoft.

A comparative lack of photographs pre-dating World War Two – only three dating to the 1920s and eleven oblique frames from 1939, all of Lowestoft – meant that very few World War One sites were recorded. Three pillboxes were identified as

being of likely World War One origin (KSS 084, RMR 011 and RMR 012). Just outside the project area, a rifle range which may date to World War One is clearly visible in proximity to an area of practice trenches and barbed wire obstructions (GSE 044), to the north of Pakefield Holiday Camp, which was requisitioned as an army camp during World War Two (GSE 067).

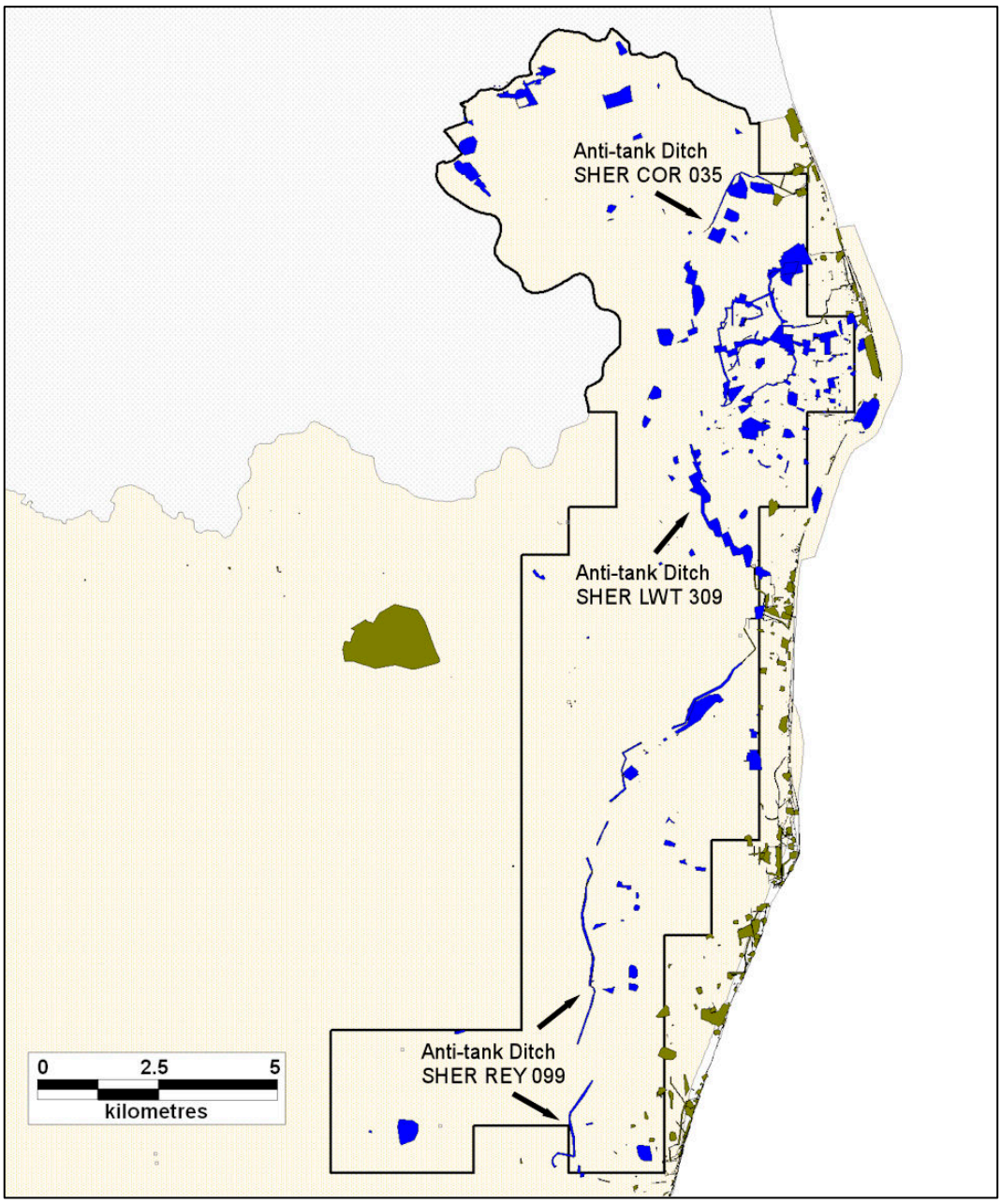


**Figure 4.9. The distribution of all World War Two sites mapped within the project area (shown in blue); existing World War Two sites recorded in the SHER (shown in brown) are also depicted to show the relationship with the coastal defences already recorded. Note the line of the anti-tank defence, running from Corton in the north to Southwold in the south.**

It is undoubtedly the case that the project's most substantial contribution to the SHER, in terms of numbers, has been the discovery and recording of sites dating to World War Two (Fig. 4.9). Two hundred sites – one third of all those recorded by the project – were recorded as containing elements dating exclusively to the period 1939–45. The vast majority of these had not been recorded previously.


**Figure 4.10. Part of the World War Two amphibious tank training site at Fritton Decoy (SOL 029 and SOL 041). Launching ramps are visible at the water's edge; a rectangular area of cleared ground within woodland was the tank park and maintenance area; trackways show the movement of tanks and other vehicles around the site. RAF/106G/LA/21 RP 3071 04-JUL-1944 Historic England RAF Photography.**

Most of the sites recorded by the project related in some way to the defence of Lowestoft, and its operation as a naval port. This topic is discussed in more detail separately in Section 6. Outside of this broader theme, the most significant site worth mentioning is the amphibious tank training site at Fritton Lake, Somerleyton (SOL 029, SOL 041; Fig. 4.10; Sommers 2013). This was used by the 79th Armoured Division from 1943 to 1947 to train crews for the use of the Duplex Drive or 'DD' tanks for D-Day landings (*ibid*.). A detailed ground survey of the structural remains and earthworks at this site has recently been conducted by SCCAS, funded by the European Interreg IV 2 Seas project on World War Two heritage in Suffolk. The aerial photographs revealed landing stages or similar structures adjacent to both the south and north side of the lake. Research into

the site conducted by Stuart Burgess, the then Country Park Manager for the Somerleyton Estate, and SCC revealed that these were launching ramps, used to simulate launching the tanks into water from landing craft. They consisted of short lengths of Bailey bridge with a ramp at the end (*ibid*.). The tank park and maintenance area is visible on the aerial photographs, with two lines of parked tanks either side of the access road. To the east, there are further structures and very recently disturbed ground. Military records, combined with ground survey at the site, have revealed that these structures relate to the amphibious escape training building and immersion pool (*ibid*.). The aerial photographs also revealed the traces of structures located within the woodland, although tree coverage obscured the full extent and function of the site and these were not mapped in detail. The ground survey has produced a plan of these structures, which formed a small camp (*ibid.*, fig. 3) and these may be the 'Herringfleet' D-Day training camp referred to in Schofield (2006).

Other small groups of military structures and areas of training activity were recorded in this area, including on the Herringfleet marshes (SOL 030, SOL 031, SOL 032), and one or all of these could also represent part of Herringfleet camp. Vehicle tracks are visible on at least one of the sites (SOL 030), and clear evidence of activity during 1944 would seem to concord with its use for D-Day training, but the evidence at the site is somewhat smaller in scale and less formally arranged than might be expected of a military camp. These areas might be better interpreted as outliers to the main camp, with most activity focussed on Fritton Lake. Recent photography suggests some traces of earthworks could still survive at some of these smaller sites, a possibility that may warrant further investigation (Appendix 1).

The scope of the NMP methodology now includes the recording of military sites dating to the Cold War period (1946–91). The project only recorded one such site, a World War Two ARP and later Cold War Control Centre on Normanston Drive, Lowestoft (LWT 179).

# 5. Research Theme: Prehistoric to Roman Field Systems

## 5.1 Introduction

Field systems, or fragments of them, were present in all three of the project Study Areas and were considered to be a major research theme, representing an important characteristic of the project's mapping, in particular for the Lothingland Study Area (Fig. 5.1). Prior to the project starting there were 340 records relating to the field systems within the SHER database. This project mapped and recorded 37 new sites relating to field system of all periods, representing approximately a 10% increase to the county record for this sort of site; it also amended the records of 25 existing sites. Given that the project area represents approximately 3% of the county, this represents a significant increase in records for this type of site. This is particularly the case, given that these statistics do not adequately represent the impact of the actual mapping itself. Often, and particularly in Lothingland, large and cohesive areas of field systems, enclosures and trackways, some up to 4km across (LUD 008), were identified and recorded as a single 'site'. Thus the number, extent and complexity of the features mapped is inadequately represented by the number of records created in the SHER.

Approximately half of the field systems mapped and recorded within the Study Areas were broadly dated to the later prehistoric to Roman period. Apart from examples cited below, where developer-funded excavations have provided dating evidence, this interpretation was applied based on the morphology and character of the fields and associated features. The remainder of the field systems were broadly interpreted as being of medieval to post medieval date; frequently this was based on apparent relationships and shared characteristics with historic maps and extant field boundaries. However, as the case studies below, and recent excavations in Carlton Colville and the Norfolk part of Lothingland (see below), indicate, an apparent relationship with historic features does not necessarily mean that the boundaries may not have much earlier, Roman or prehistoric, origins. Other sites, such as former earthworks of fields and ridge and furrow (BNC 001) in Benacre Park (BNC 202), associated with a possible medieval village likely to have been emparked within a compartmentalised post

medieval deer park (Williamson 2000, 84, 116), provided a clearer indication of their historic date.

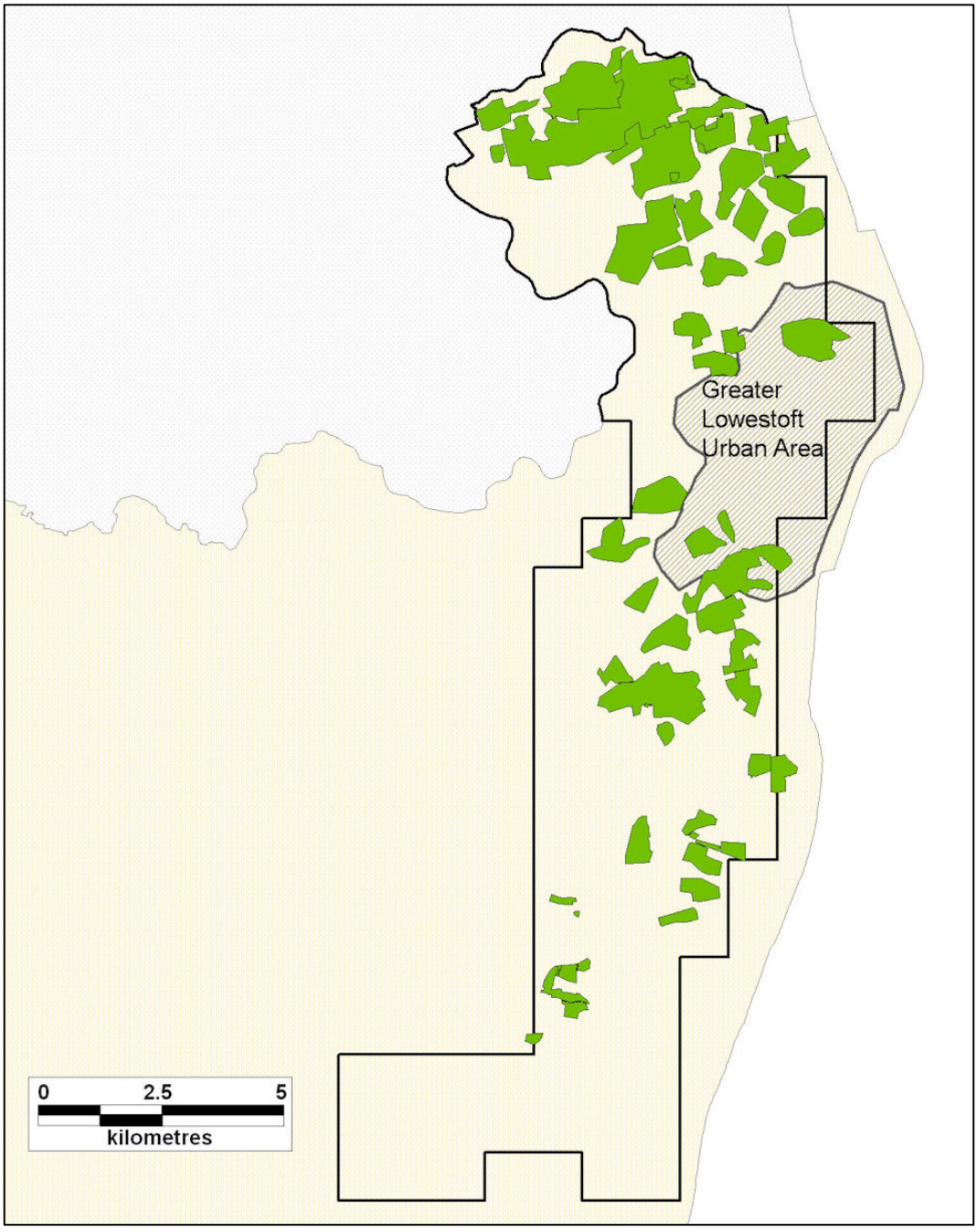


**Figure 5.1. The distribution of field systems recorded by the project.**

The land use, soils and topography of the three Study Areas undoubtedly affected both the development of field systems in these areas and also their visibility on aerial photographs. Unsurprisingly the Lowestoft Study Area – given the large zones of built-up areas, marshes and water – had comparatively low numbers of field systems (eight sites; 0.3 per sq km). The rate of urban and suburban expansion in the Lowestoft area meant that there were more limited

opportunities for recording any possible extensions of the cropmark sites recorded to the immediate north in the Lothingland Study Area. However fragments of potentially complex and multi-phase field systems and trackways (LWT 286) were intermittently visible on pre-1970s aerial photographs, prior to the development of the area, and may indicate that areas of Lowestoft – in particular on the loamier soils within the northern part of the town – may have seen a similarly dense development of field system landscapes as those recorded within the predominantly arable landscape of the Lothingland Study Area. The AONB Study Area yielded evidence for 28 sites where at least part of the site was recorded as a field system (0.4 per sq km). These were mainly within the northern part of the Study Area and broadly clustered on and around the areas of loamy clay soils, but frequently located on the margins of sandy soils more typical of the Sandlings.

It was the Lothingland Study Area where field systems were a defining characteristic of the archaeological landscape recorded on the aerial photographs. The Lothingland Study Area is situated on the southern part of Lothingland, an elevated area with light soils, defined by the River Waveney and the marshes of the former estuary to the west and by the coastline to the east. The Norfolk NMP results on the adjoining northern part of Lothingland (Fig. 5.2) revealed dense and complex evidence of prehistoric, Roman and medieval to post medieval field systems. This cropmark landscape, combined with a wealth of surface finds and excavation data, has indicated that Lothingland, along with the former 'Isle' of Flegg to the north, is an exceptionally important area for understanding the development of prehistoric and Roman settlement and enclosure in this part of East Anglia (Albone *et al.* 2007a; Medlycott 2011). Recent developer-funded excavations of field systems and enclosures recorded by NMP projects in this area, such as those at Ormesby St Margaret and Hemsby (Bates & Crowson 2004; Bates forthcoming), Ormesby St Michael (Gilmour & Mortimer 2012) and Gorleston/Hopton-on-Sea (Adams *et al.* 2011) have revealed Middle to Late Bronze Age dates for the origin of some of the enclosed landscapes. These results provide clear evidence to support David Yates' 2007 assertion – at the time unproved – that the light soils of these eastern coastal margins were a prime location for the development of Bronze Age field systems, which at the time of publication were thought to be largely absent in this part of southern England (Yates 2007). A recent reassessment of some of the NMP data

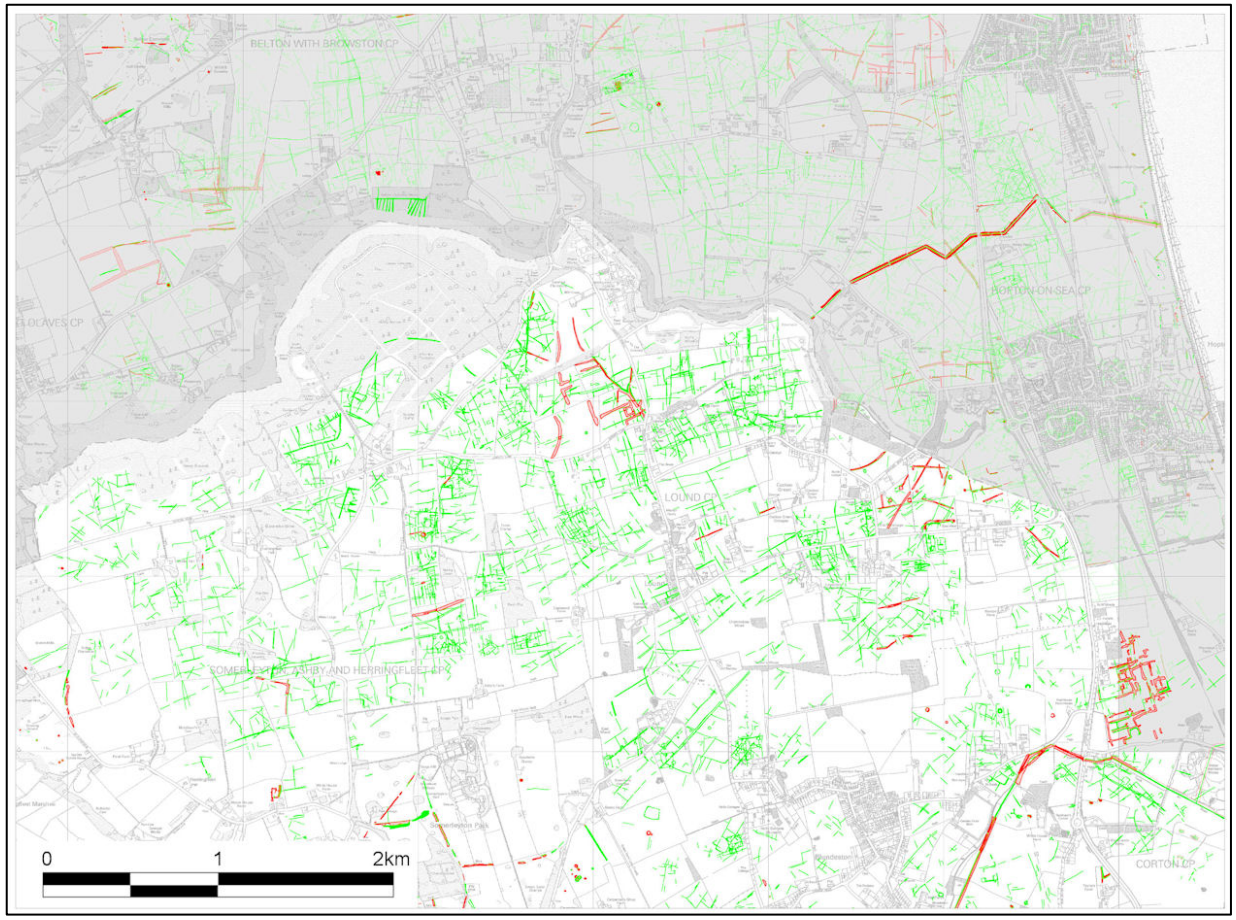


**Figure 5.2. NMP mapping of the Lothingland Study Area, which was predominantly characterised by field systems. To the north and east, the figure also shows the corresponding NMP mapping for Norfolk and the Suffolk Coastal Zone (grey background).**

in the light of these excavation results has tentatively started to identify other previously unrecognised Bronze Age enclosures and fields within the wider field system landscape (Gilmour *et. al*. 2014).

Excavations within Suffolk, like much of East Anglia, are also increasingly producing evidence for cohesive and well established pre-Roman field systems. Recent work in advance of the Sutton Hoo Visitor Centre at Tranmer House, Bromeswell (BML 018: MSF17313), provides further evidence for extensive prehistoric boundaries and field systems that preceded the Anglo-Saxon activity at the site (Fern forthcoming). The Sutton Hoo landscape appears to have been first enclosed during the Early or Middle Bronze Age (SUT 038: MSF3401), when a series of boundaries and tracks or droves were established, associated with contemporary settlement (Carver 1998, 98–101; Hummler 2005, 391; Jude Plouviez, SCCAS, pers. comm.). A further network of coaxial rectilinear fields was established across the terrace during the Middle Iron Age, many of which appear to follow the same alignment as the earlier boundaries (Hummler 2005, 406); these were mapped from aerial photographs as part of the Suffolk Coast NMP (EH 2912), which augmented earlier transcription work (Copp 1989). These fields are thought to have continued in use into the Roman period, but were abandoned by the mid 1st millennium AD, due to soil loss and degradation, despite the embanked enclosures (Carver 1998, 100).

Evaluation and excavations at Kessingland (KSS 080), just on the outer eastern edge the AONB Study Area, revealed evidence for a Middle Bronze Age enclosure and/or field system and associated settlement in the area (Heard 2008; 2011a). Other recent excavations on the Suffolk and Cambridgeshire border at Fordham Road, Newmarket (NKT 047; Rees 2014) have also revealed significant evidence for Middle Bronze enclosures and boundaries. This evidence, along with earlier developer-funded work along the River Snail Valley, such as that produced during the A142 Fordham By-pass work, reveals increasing evidence for Middle and Late Bronze Age enclosures and field systems associated with the fen edge (Yates 2007, 98-9). There are also a group of developer-funded sites in the east of Ipswich and at Martlesham that are providing evidence of Middle to Late Bronze Age field systems; these may ultimately tie in with the very extensive evidence for field systems mapped by NMP projects on the Shotley and Felixstowe peninsulas (Jude Plouviez, SCCAS, pers. comm.). Re-evaluations of artefactual data, such as the ceramic assemblages at County Farm, Chilton, also

indicate a Middle to Late Bronze Age date for the large enclosure (CHT 009; Abbott 1998). Reviews of the dating of the development of field systems provided by developer-funded work has started to alter understandings of this phenomenon, with a shift from the perception of these being Iron Age or Roman to a predominantly Middle Bronze Age origin for large areas of fields, followed by a separate phase of establishment of fields in the later Iron Age and Roman periods (Yates 2007, 110).

Additionally, recent archaeological work in Suffolk has also highlighted the potential for rapid change and re-organisation of the landscape within a single 'period'. Excavations undertaken in advance of the construction of a new section of dual carriageway along parts of the A11 at Chalk Hall Farm, Elveden, revealed evidence for ditches, paddocks and trackways all following a broadly similar alignment dating from the Late Iron Age to mid-Roman period. However during the Late Roman period the alignment of boundaries and trackways all shifted and the dominant axis of the site was altered (Mark Hinman, Pre-Construct Archaeology, pers. comm.). The excavations at Bloodmoor Hill, Carlton Colville, located on the border of the Lowestoft and AONB Study Areas, have also provided evidence for significant levels of change within a relatively short time frame (Lucy *et al*. 2009), where two phases of Roman enclosures, boundaries and fields were identified within a relatively short-lived settlement dated to the 2nd and 3rd centuries AD. The chronologies provided by these sorts of excavation provide reminders of the sometimes rapid changes that 'multi-phase' cropmark enclosures and field systems underwent. However, as discussed in the Carlton Colville case study below, developer-funded work combined with the NMP mapping may indicate that the fields and trackways in this area reflect a much longer period of use than the Roman period.

## 5.2 Case Study: Lound and Somerleyton (Lothingland Study Area)

### 5.2.1 Background

A principal impetus for mapping the southern part of Lothingland was to investigate and record the probable continuation of the complex and multi-phase field systems, trackways and enclosures that were encountered to the north, within the Norfolk part of Lothingland (Fig. 5.2). Although no detailed analysis of

this complex landscape has yet taken place, they were discussed within the Norfolk Coast NMP report (Albone *et al*. 2007a). A lack of dating evidence meant that interpretations were largely based on morphology, analogy, chronological relationships suggested by the mapping and/or their relationship to historic or existing boundaries, roads and field boundaries. For example, some substantial areas of fields and boundaries were assumed to be of likely medieval to post medieval date, often due to their shared alignment with the modern landscape – frequently having boundaries in current or relatively recent historic use – or because they showed clear signs of recently having had a banked component: banked field boundaries are a rarity in Norfolk's cultivated landscape unless comparatively late and recently ploughed. This includes some systems of fields that border onto the Suffolk Lothingland Study Area, for example NHER 45155, 45165 and 45159. However dating evidence produced by developer-funded work since the Norfolk mapping was completed, most notably at the Gorleston Development Area, has indicated that at least some of these seemingly late field boundaries (NHER 45158 and 43494) could have prehistoric origins. In particular one boundary, part of which appeared to have remained in use as a parish boundary, contained a Middle Bronze Age hoard, consisting quit-headed pins, twisted torcs and bracelets (Adams *et al.* 2011, Pitts 2012). A large coherent coaxial field system at Hopton-on-Sea (NHER 43495) running alongside the coastal strip, formerly on Gorleston Common, was interpreted as a possible 'planned' Roman landscape, associated with other areas of fields and a postulated Roman road (NHER 43591). This putative Roman field system runs south towards the Suffolk border and the Lothingland Study Area; see Lound Case Study below for discussion of a possible continuation into Suffolk.

The Lothingland Study Area produced some extremely dense and coherent field system and settlement landscapes, unsurprisingly given the nature of the previous NMP mapping to the immediate north, within the Norfolk section of Lothingland (Albone *et al.* 2007a). Interestingly there was slightly less evidence for the layering of clearly different phases of field systems, with newer systems being developed on top of older ones, than the Norfolk mapping revealed. The Lound and Somerleyton area revealed two strikingly different, but both well-developed and coherent systems: SOL 010, SOL 002 and SOL 017 (shown in beige on Fig. 5.3), and LUD 008 and LUD 016 (shown in grey on Fig. 5.3). These two field systems almost abut one another, with only small areas of layering of one on top of the other. It is assumed that the southern field system (SOL

010/SOL 002/LUD 017) is the oldest of the two, due to the lack of coherence with the medieval and later landscape, when compared to LUD 016 and LUD 008 – although see below for discussion of some noticeable relationships.

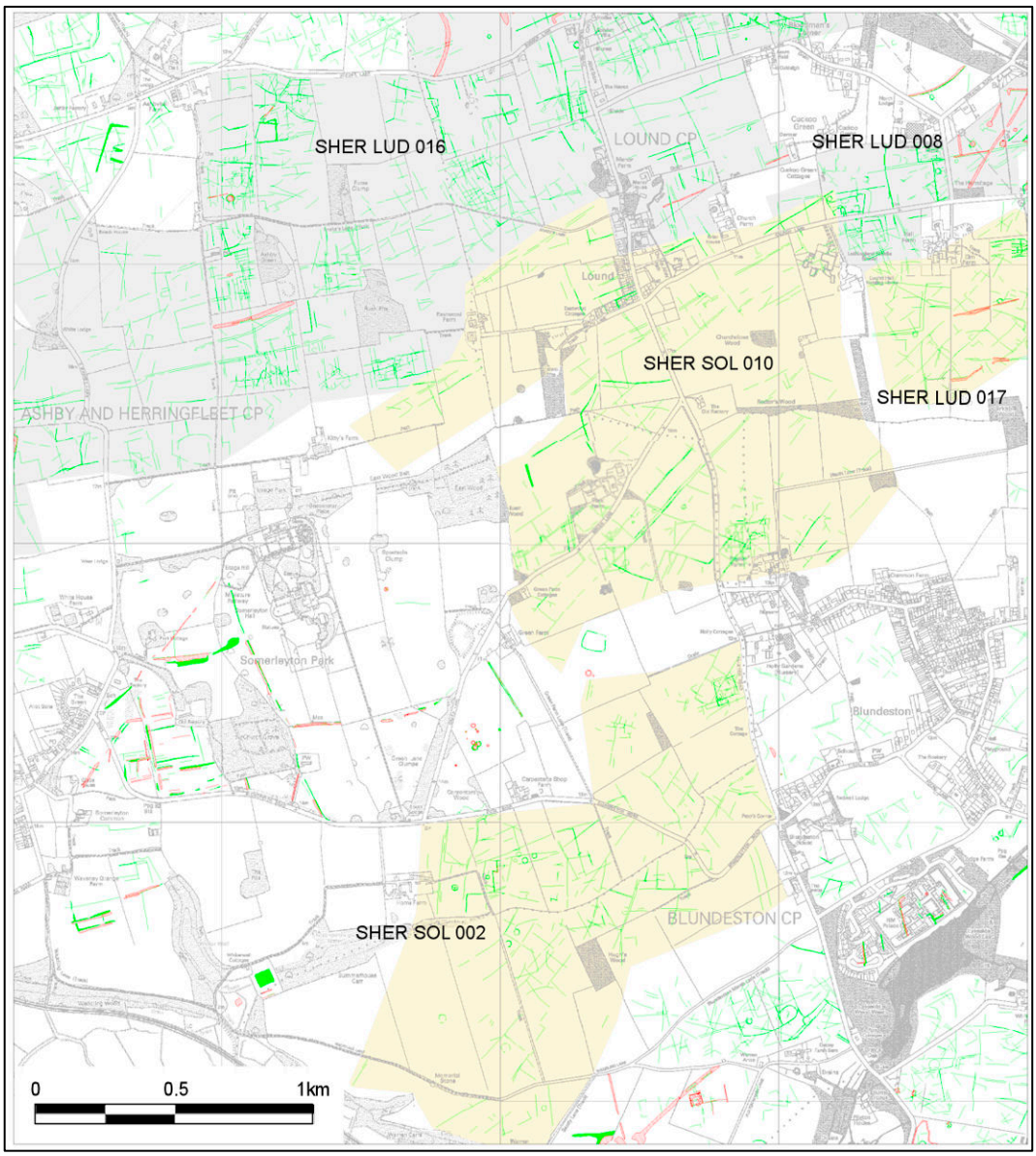


**Figure 5.3. Map showing the extent of the two main field systems within Lound and Somerleyton parishes: LUD 016/LUD 008 (extent of sites shown in grey) and SOL 010/SOL 002/LUD 017 (extent of sites shown in beige).**

## 5.2.2 Later Prehistoric and/or Roman

The SOL 010 complex consists of a large coaxial field system of unknown, but probably later prehistoric and/or Roman, date. The site is centred on TM 5055 9848, with the main concentration of features being around Park Farm, Lound. Other areas of fields nearby, for example SOL 002 and LUD 017 (and slightly

further afield potentially also parts of BLN 047 and COR 003), would appear to be a continuation of – or at least broadly the same phase as – this coherent block of coaxial system; unless specified otherwise the discussion here is of the main 'system', including SOL 010, SOL 002 and LUD 017 (Fig. 5.4). The main characteristic of these sites overall is a series of broadly parallel fragmentary trackways and linear boundaries, with a coaxial pattern of fields (or paddock and/or enclosures) in between. It is possible that Green Lane, at Park Farm, Lound – which follows the same alignment as the tracks in places – could represent a fossilised part of this ancient landscape. A map of the Somerleyton Estate dated 1652 (Suffolk Record Office AR 295), would also suggest that further lanes, tracks and boundaries following this orientation, continued in use into the early post medieval period, but are now removed. Hodskinson's map of 1783 also shows a triangular remnant of heath to the north of the Park Farm, one edge of which follows the predominant alignment of these cropmark trackways.

Towards the southern edge of the 'system' there is a slight change of orientation and overall pattern within the fields recorded under SOL 002 (Fig. 5.3). This may in part be due to the topography, with a network of minor valleys associated with a former watercourse and the land dropping down towards the Somerleyton and Blundeston marshes and the broad valley of the Waveney River. This land presumably would have been utilised as grazing land and for wetland resources during later prehistory; although there is no direct evidence for this, it could be suggested by the wider environmental sequence established for the Broadland valleys (Coles and Funnel 1981; Williamson 1997). Therefore the change in orientation could also perhaps indicate a change in land use and the types of activities being undertaken. There is also greater evidence for a multiple phases of fields, enclosures and trackways in this area, perhaps indicating a greater time depth and incorporation of the coaxial fields in later landscapes in this area.

There is no clear evidence of obviously contemporary settlement associated with these fields, however it is entirely possible that whilst agricultural activity had become monumentalised in the landscape, domestic sites were still largely unenclosed during the Bronze Age and Iron Age (Dymond & Martin 1999, 40; Yates 2007). However, there is increasing evidence for enclosed settlement within Suffolk, for example the roundhouse enclosed within a penannular ring ditch or 'ringwork', 20m in diameter, of Late Bronze or Early Iron Age date that has recently been excavated at Gisleham (CAC 035) within the AONB Study

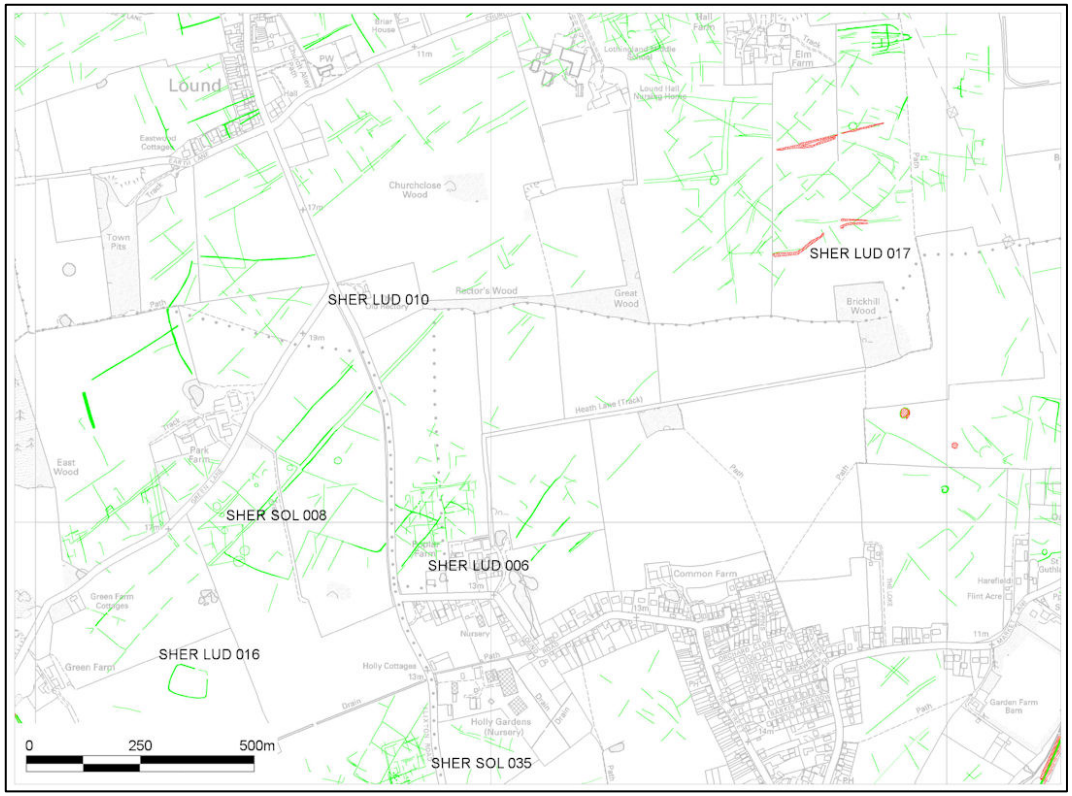


**Figure 5.4. The main area of the field system of probable later prehistoric date at Lound and Somerleyton (in text mainly SOL 010, but includes SOL 002 and LUD 017). Also visible is a sub-rectangular enclosure (SOL 016), two enclosure complexes or farmsteads (SOL 035 and LUD 006) and a group of ring ditches (SOL 008) to the south of Park Farm.**

Area (Heard 2010), and the Middle Bronze Age enclosure and roundhouses at Fordham Road, Newmarket (NKT 047; Rees 2014). Whilst it is feasible that the large group of ring ditches (SOL 008), which range in size from 8m to 23m in diameter and are located within the main area of fields at Park Farm (Fig. 5.4), could represent the eaves-drip gullies of contemporary domestic roundhouses and/or agricultural structures (the larger examples potentially representing enclosures around roundhouses) it seems most likely that these are earlier round barrows. In particular the ring ditch located directly within the main axial trackway, and another seemingly cut by a boundary ditch, would suggest this relationship. At the same time, it must be borne in mind that the components of the system, like areas of settlement, could have fluctuated over the site's period of use.

A trapezoidal enclosure (SOL 016) slightly offset from the main group of trackways and fields at Park Farm (Fig. 5.4), could feasibly represent a farmstead or domestic enclosure contemporary with the fields. The substantial ovoid enclosure set within fields (BLN 007; Fig. 5.5a) to the south of the main field system at Blundeston, could also feasibly represent an enclosed settlement. The enclosure is associated with a segment of trackway, which appears to incorporate an earlier ring ditch (BLN 039) – although it is feasible that it relates to a contemporary enclosure and/or structure – which follows the same alignment as the main axial trackways to the north and the alignment of the fields to the west as the land drops down to the River Waveney. This would suggest that this enclosure and trackway represent part of this contemporary landscape, although the enclosure appears to have persisted in some form and has been incorporated into later field layouts. It must be noted that the tracks following a similar alignment to the southwest (BLN 041) are marked running across an area of 'sheep walks' or heath on the 1652 Estate Map of Somerleyton; however these may of course be more ancient tracks than have persisted in use, as suggested above for other routes. Due to the close relationship of this enclosure and the well-defined trackway, which appears to have led down towards the river valley and wetter ground, it is feasible that this site represents a stock enclosure and compound, and not a domestic site. Another sub-rectangular or ovoid enclosure associated with a trackway and located in close proximity to the wetter ground was recorded to the northwest on the edge of Fritton Decoy (ASY 002; Fig. 5.5b). The enclosure is located alongside a curving boundary ditch or hollow way that defines the upper edge of the cropmarks in this area and is visible as an earthwork as late as 1951 (sections of this may survive within the now wooded


**Figure 5.5. Enclosures associated with trackways and fields located in close proximity to wetter ground and watercourses, at Blundeston (a) (BLN 007) and Fritton (b) (ASY 002) and on the edges of the main field systems.**

Ashby Warren). The area of this enclosure and track, and associated fields and boundaries, is depicted as either warren or common on the 1652 Somerleyton

Estate map and Hodskinson's map of 1783 suggesting that many of these features are of some antiquity as more correspondence with the post medieval landscape would be expected if these related to expansion onto the common or warrening activity during this period.

The field system cropmarks associated with this enclosure follow a broadly similar alignment to SOL 010 to the southeast, and would appear to represent part of the same wider enclosed landscape. It is interesting to note that these fields following the SOL 010 alignment, unlike those cropmarks surrounding it (LUD 016, ASY 002), are located on land defined as common in the 18th century, perhaps supporting the view that these represent an earlier landscape. Although it is hard to establish from the cropmarks alone, it would appear that parts of these fields became incorporated into what is assumed to be the later phase of fields in this area (LUD 016). As discussed below, the two major phases of fields in this area (SOL 010 and LUD 016) seem to be mutually exclusive in their extent, there appearing to be few places where they overlie one another. A set of conjoined and segmented double-ditched enclosures (LUD 055), possibly representing a broadly contemporary outlier of this field system, or perhaps an area of associated settlement (Fig. 5.7), is recorded to the northeast of the main areas of fields in Lound. Though undated, the enclosure shares some similarities with the recently excavated Middle Bronze Age enclosure at Fordham Road (NKT 047; Rees 2014) and other excavated and cropmark sites in Norfolk and Cambridgeshire (Gilmour *et al.* 2014). An Iron Age or Roman date would also fit with the morphology of the site; however the enclosure appears to be overlain by parts of LUD 016 of suggested Roman date. Parts of SOL 010 also appear to be overlain by rectilinear enclosure complexes and/or farmsteads (SOL 035 and LUD 006; Fig. 5.4). A possible Roman date was suggested for these seemingly later sites, however a later Anglo-Saxon to post medieval date is also possible.

These coaxial fields, with their long parallel trackways and boundaries, appear to follow a pattern of land division already recorded widely within the Norfolk parts of the Broadland interfluves and peninsulas (Albone *et al.* 2007b). Most notable is the large and cohesive system recorded between Beighton and Cantley on the southern part of the Yare-Bure peninsula, where sixteen parallel trackways are apparent. Like the Lothingland systems, little or no excavation has taken place in these areas of the Broads Zone coaxial field systems to provide firm evidence of their date. Consequently the postulated Iron Age and/or Roman date of the

cropmarks relies on a combination of surface finds, comparison with dated examples recorded elsewhere, and their apparent spatial and chronological relationships with other landscape features. There are clear similarities between the Lound cropmark coaxial fields, those previously recorded on the Norfolk Broads interfluves and the 'brickwork' fields recorded in North Nottinghamshire/South Yorkshire (Riley 1980). Excavations of those field systems have produced both Iron Age and Roman dating evidence (Riley 1980, 25-6; Willis 2006, 113; Albone *et al.* 2007b), whereas fieldwork for some areas supports a predominantly Roman date (Knight *et al.* 2004). In one case the field system cropmarks were cut by a Roman road suggesting that they were of Iron Age or early Roman origin (Riley 1980, pl. 2), an argument that has also been used to date coaxial fields in Suffolk evidenced by surviving boundaries (see below). However, with increasing evidence for the development of coaxial fields in the Middle Bronze Age across southern Britain (Yates 2007; Gilmour *et al.* 2014), then a Bronze Age date must be considered for at least some of these systems in Lothingland, and potentially also the Norfolk Broads systems.

The development of coaxial field systems across Britain appears to cover a considerable timeframe, ranging from the Bronze Age through to the post medieval period (McOmish 2011). There has been much discussion and debate over the origins of extant (*i.e.* defined by surviving field boundaries) coaxial field systems in Suffolk and south Norfolk, for example those in the Scole/Dickleburgh area, which were originally suggested as being prehistoric due to the fact that the Roman Pye Road cuts obliquely across the network of fields and lanes (Williamson 1987). The most recent interpretation suggests that the 'system' is in fact the product of groups or panels of boundaries aligned preferentially for drainage that developed independently, rather than a larger cohesive planned landscape (Martin & Satchell 2008). However there is still potential for the parallel lanes that lie at the heart of these fields, which appear to pre-date the establishment of the parish boundaries, to be later prehistoric in date (Williamson 2006). This may be confirmed by the results of an excavation at Hartismere School, Eye, where a trackway that might have formed part of Williamson's Yaxley system has been shown to definitely pre-early Anglo-Saxon in date, and very probably pre-Roman (Jude Plouviez, SCCAS, pers. comm.). The layout of the Lound field system/s is reminiscent of the Suffolk coaxial systems, such as Scole-Dickleburgh and the North Nottinghamshire/South Yorkshire systems, in that the long boundaries and trackways are positioned broadly perpendicular to

the main river valleys (Williamson 2006, 50). This has been interpreted as a result of transhumance, with the division of land into strips which had access to both upland and lowland grazing areas.

### 5.2.3 Roman and/or Medieval

As stated above, there is a second major phase of fields and trackways that broadly follow the alignment of the medieval to post medieval and modern landscape (LUD 008, LUD 016), but are suspected as having an earlier, Roman origin. The extensive area of coaxial and rectilinear field systems, trackways and enclosures is recorded across a large area (approximately 4km by 1.5km) of Lound, Somerleyton, Ashby and Herringfleet parishes (Fig. 5.6). Whilst sharing a similar orientation with the more modern aspects of the landscape, none of these boundaries is depicted on the Ordnance Survey 1st Edition map, and in many cases they appear to underlie those boundaries depicted on the map. Comparison with the 1652 Estate Map of Somerleyton would suggest that at least some of the boundaries continue in use into the medieval to post medieval landscape or feasibly represent later features. The area to the north of Border Lane, Lound, includes some broad soilmarks of former banks and/or hedges and hollow ways, suggesting that at least some of these features may have been extant into the 20th century. Whilst it is feasible that this cropmark landscape represents a historic one that has been subject to a massive degree of boundary change, it seems unlikely that there has been such wholesale and consistent change over such a large area. It is worth noting that at least some of these cropmarks (LUD 016, SOL 057) in the area of St Mary's church, Ashby (ASY 001), may relate to medieval settlement around Ashby Green, indicated by possible building material (ASY 010) and medieval pottery (ASY Misc.) in the ploughsoil.

Although the character of the field system over the whole area is changeable. The eastern area can broadly be characterised as being arranged around a series of trackways, and in this aspect its character is similar to the SOL 010 system, although the arrangement is less clearly defined by these features. The western part of the site is generally more fragmentary and is likely to represent more than one phase of fields. Much of this enclosed landscape may represent agricultural fields and paddocks, however there are areas within it that may

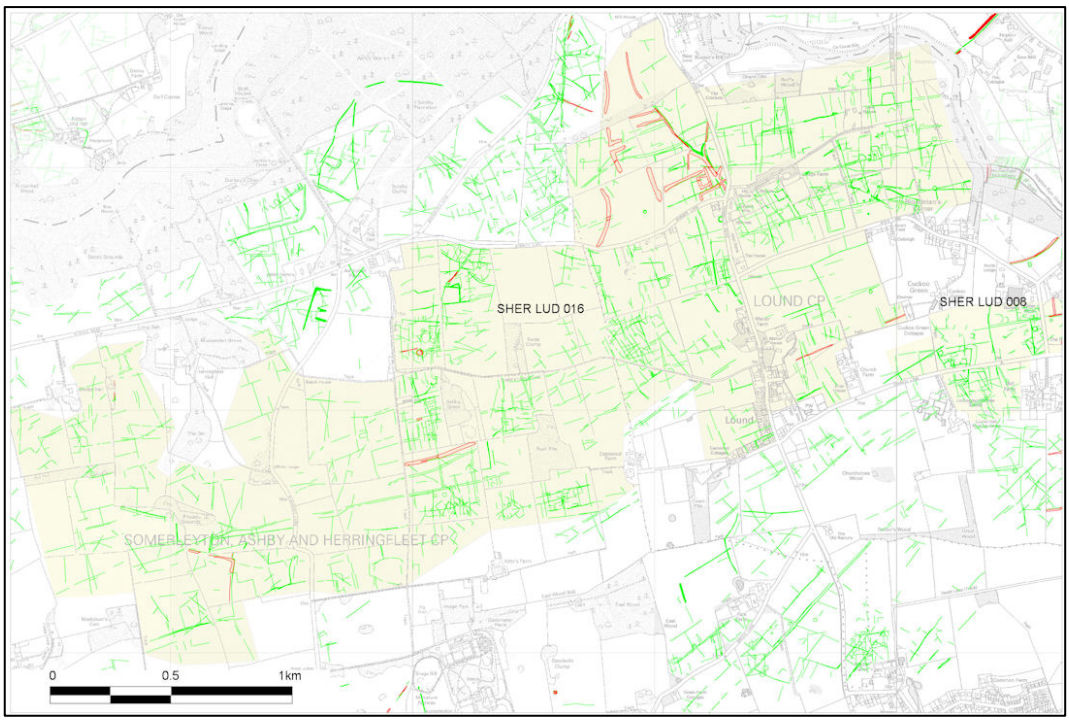


**Figure 5.6. Large areas of field systems and trackways in Lound and Somerleyton parishes, of probable Roman or later date (LUD 016 and LUD 008).**

represent locations of settlement, for example in the Lodge Farm area, Lound (Figs 5.7 and 5.8). These enclosures, set within a complex network of trackways and fields, could be interpreted as being Roman in date on morphological grounds. A 1st century AD Roman coin (LUD 106: MSF15160), has been found near enclosures and trackways in this area, although it could equally relate to the seemingly earlier enclosure (LUD 055) also mapped in this area (see shaded area on Fig. 5.7). It is entirely feasible, however, that these features relate to early medieval settlement and agricultural fields and tracks, with the main trackway, potentially representing an earlier continuation of Border Lane to the west. The trackway which remains in use – running east from Lodge Farm – and converging with the cropmarks, would appear to correspond with the trackway defining the edge of Lound Common on Hodskinson's map of 1783. It is therefore possible that some of these enclosures and those to the north represent medieval common-edge settlement and encroachment onto this land.

The eastern area of this wider system of tracks, enclosures and fields recorded under LUD 008, could also suggest a pre-medieval to post medieval date. Here enclosures, some of which incorporate elements of the earlier SOL 010 field system, appear to be cut by Church Lane, which led from Lound towards Boyton

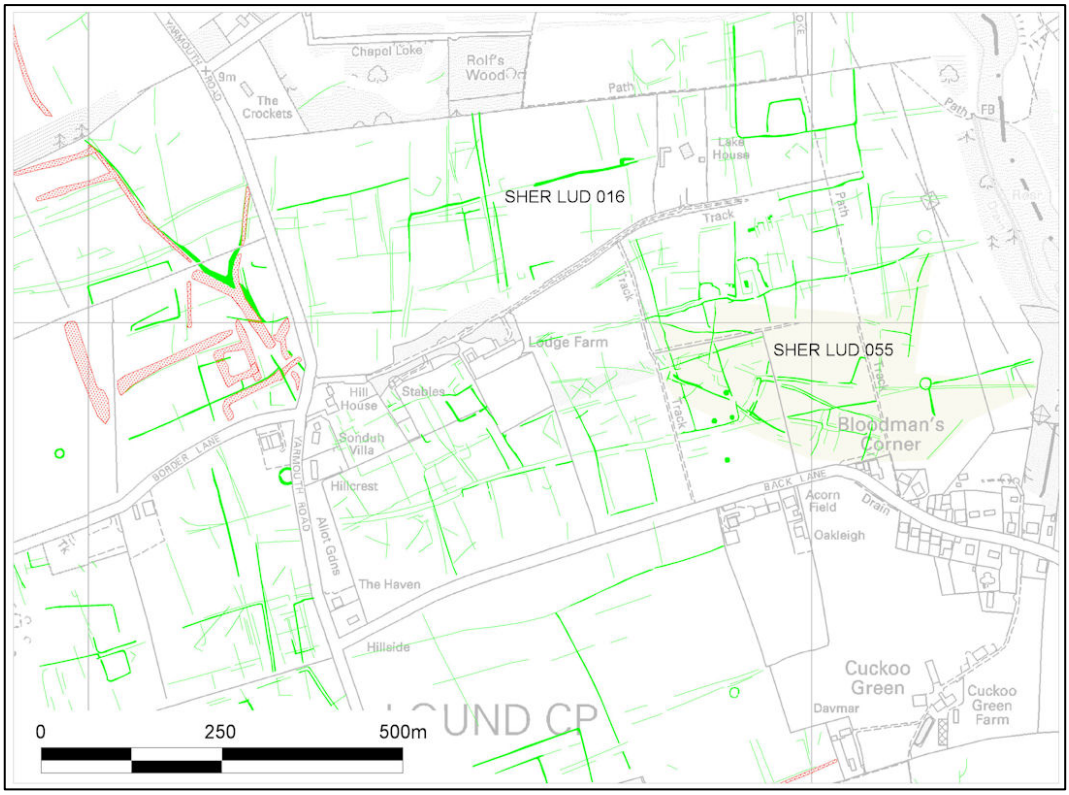


**Figure 5.7. The enclosures, trackways and fields at Lodge Farm, Lound (LUD 016), which appear to overlie another set of conjoined enclosures and tracks (LUD 055).**

**Figure 5.8. Cropmark enclosures and trackways forming part of LUD 008. Photograph © Norfolk County Council BKS 0868 (NCC 3947) 06-AUG-1988.**

Common to the east (Fig. 5.9). It would also appear in this area that the cropmarks indicate tracks and enclosures on the area defined as common land. Without further historic map research into significant changes to the landscape in this area in the post medieval period, it is hard to speculate as to the likelihood of these all representing a late encroachment onto and around the common. On morphological grounds these enclosures, trackways and fields – like those at Lodge farm – could be interpreted as being Roman in date, in particular those enclosures within the eastern part of the site, which potentially have internal roundhouses or similar circular structures (LUD 043). At the same time, it is worth noting that Middle Saxon pottery has been found within the eastern part of the site (LUD 005). Another area of possible settlement was identified within LUD 016 to the north of Somerleyton Park, where two ring ditches were recorded within an enclosure off one of the main trackways (ASY 018), although it is not clear whether these relate to the remains of earlier barrows or broadly contemporary domestic or agricultural structures.

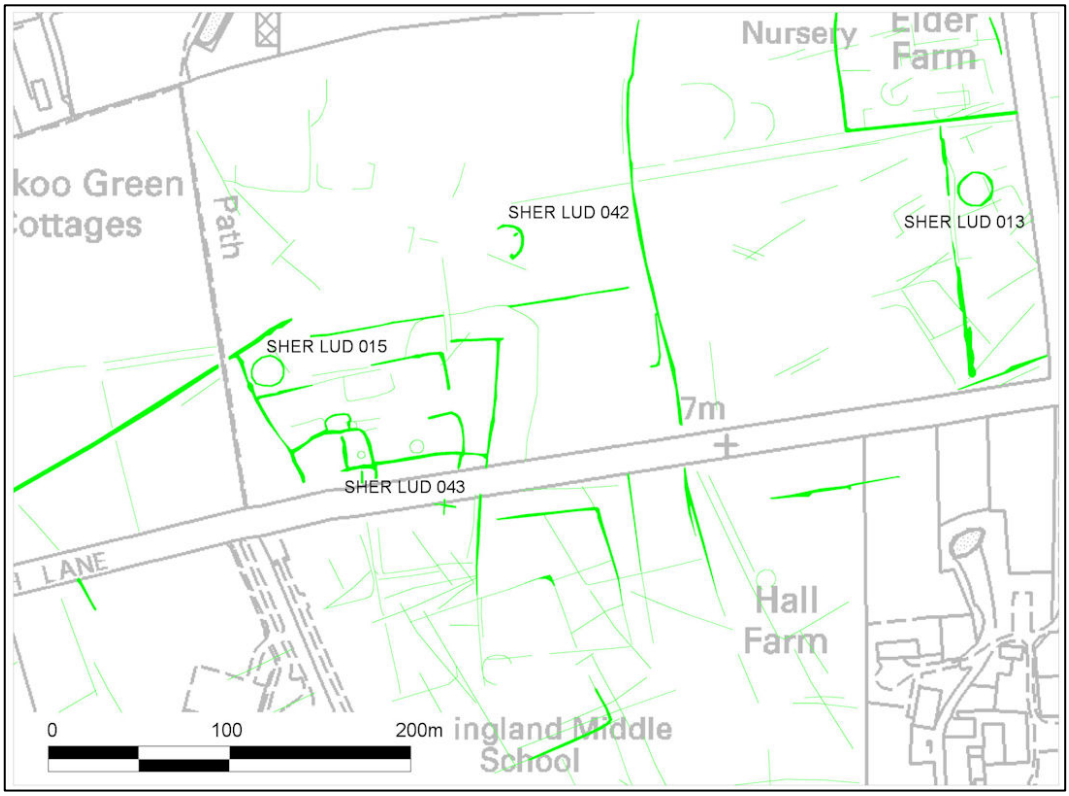


**Figure 5.9. Enclosures, trackways and fields (LUD 008) cut by Church Lane, Lound. Also visible are numerous ring ditches (for example LUD 013, LUD 015 and LUD 042), which may relate to either Late Neolithic and/or Bronze Age ceremonial monuments or round barrows. Two smaller ring ditches, possibly roundhouses and/or agricultural structures (LUD 043), were also identified within the enclosures.**

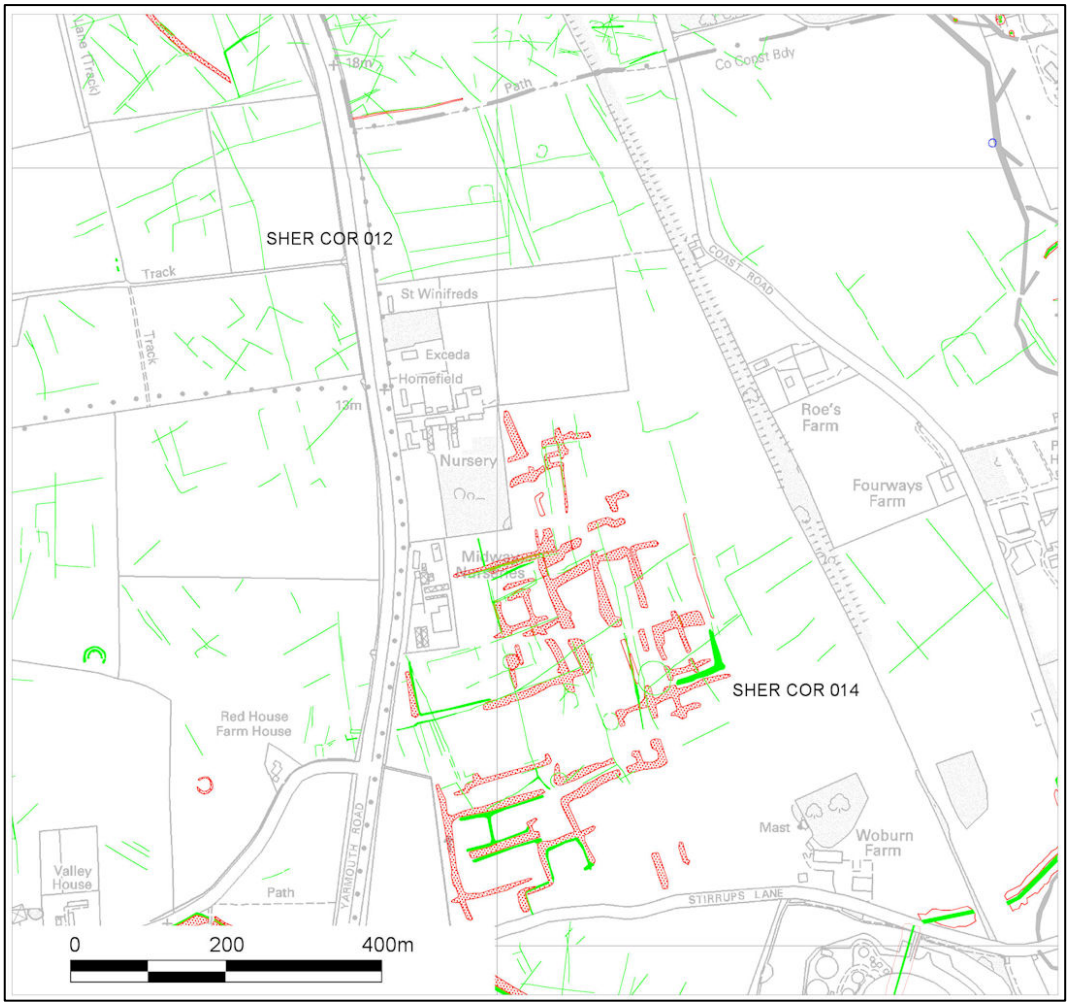


**Figure 5.10. Fields and enclosures (COR 014) located where Boyton Common and woodland are depicted on Hodskinson's 1783 Map of Suffolk. The soilmarks of possible field and/or enclosure banks, hedges or turf walls were detectable within the part of the site depicted as woodland in 1783, perhaps indicating survival of earthworks until relatively late.**

An area of soilmarks suggesting a network of banked enclosures, one small component of which was still earthwork in the 1960s, has been added to an area of ditch-defined fields recorded in Corton (COR 012, COR 014), which broadly follow the same alignment as LUD 008 and LUD 016. The size, arrangement and orientation of these embanked fields potentially appears to form a continuation or extension of the extensive coaxial field system recorded to the north in Norfolk (NHER 43495), or at least orientated and arranged in the same manner (Fig. 5.10). A Roman date has been put forward for this extensive area of fields (Albone *et al.* 2007a), although further assessment is needed. It may be that these enclosures represent late medieval infill within a landscape defined by earlier alignments and boundaries. The survival of the bank, turf or hedge material well enough to show as soilmarks at this location may relate to this part

of the field system being shown as woodland on Hodskinson's map of 1783. The fields to the north (COR 012) are shown as being predominantly on the common, as are the dense area of fields to the north in Norfolk (NHER 43495).

## 5.3 Case Study: Carlton Colville (Lowestoft/AONB Study Areas)

### 5.3.1 Background

Developer-funded work in the area of Carlton Colville, located within the urban expansion zone to the south of Lowestoft, has allowed for some other interesting areas of field system and enclosure cropmarks to be partially dated and to provide a framework through which the surrounding field systems could be interpreted. Excavations at Bloodmoor Hill (CAC 016) revealed a substantial archaeological landscape consisting of a major Roman trackway or drove way and a series of enclosures and fields, together with a substantial Anglo-Saxon settlement and cemetery (Lucy *et al.* 2009). Large quantities of prehistoric flint (over 1,100 pieces) and Bronze Age pottery were also found at the Bloodmoor Hill site, although only three possible prehistoric pits were identified (*ibid.* 22; 349). A general concentration of prehistoric flints and Bronze Age pottery within the enclosures was interpreted as relating to Early to Middle Bronze Age settlement in the locality, the remains of which resulted in residual inclusion of prehistoric material within the trackway and enclosure ditches. The NMP mapping for the area of the excavations – in common with aerial photograph assessments undertaken as part of the evaluation and post-excavation analysis (Lucy *et al.* 2009) – was limited and did not reveal the complexity of the sub-surface archaeology; rather it mainly revealed a series of largely medieval to post medieval field boundaries and agricultural features (Fig. 5.11), which partially obscured what was underneath, with only small fragments of the trackway and enclosure system being identified from cropmarks. This may be partly due to the presence of surface spreads of material and midden deposits overlying much of the site and masking the underlying archaeology, with only features cut into this showing clearly as cropmarks.

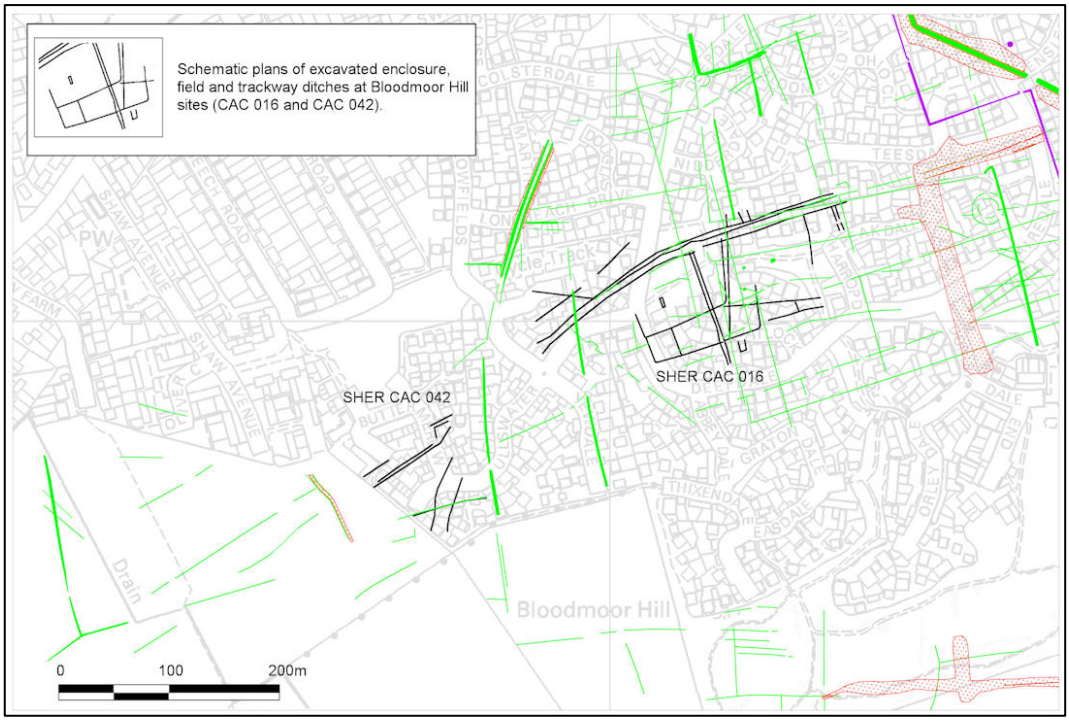


**Figure 5.11. Cropmarks of fields and trackways in the area of the Bloodmoor Hill excavations, Carlton Colville (CAC 016, CAC 079 and CAC 042; excavated ditches shown in black). Many of these cropmark ditches were interpreted as being of potential medieval to post medieval date; however some appear to relate to an extension of the trackway dated to the Roman period by the excavations, although an earlier date was also postulated. (Source for excavation data Lucy *et al*. 2009; Heard 2011b; 2013.)**

## 5.3.2 Later Prehistoric and Roman Periods

The excavated sections of the trackway, enclosures and fields at Bloodmoor Hill suggest that they relate to a relatively short period of Roman settlement and activity in the 2nd and 3rd centuries AD (Lucy *et al.* 2009), within which two phases of ditch and enclosure construction were identified. It has been suggested that the lack of material dating to the later Roman period indicates that the field system had been infilled by the mid to late 3rd century (*ibid*. 33). However, it must be noted that there is a relative lack of Roman material from the ditches overall – in particular the main trackway and associated boundaries – considering the contemporary settlement and agricultural structures in close proximity. More recent excavations on further parts of this trackway to the west (CAC 042), produced significant evidence for Late Bronze Age settlement (Heard 2011b; 2013). Fragments of a rectilinear enclosure and/or field system – the ditches of one of which were cut by a Roman pit – were assigned a Late Bronze Age date and these followed the same alignment as the trackway (Heard 2013,

47). It was initially suggested that the continuation of the CAC 016 trackway was also a Late Bronze Age feature, due to the inclusion of later Bronze Age pottery in the fill (Heard 2011b, 14-15, 22). However it was later revised to a Roman date, but again Roman finds were almost absent (Heard 2013, 62-5). Another undated section of trackway, which truncated one of the Bronze Age houses, was also interpreted as being of Roman date. This further evidence from CAC 042 could therefore indicate a much earlier date for at least some of the Carlton Colville boundaries and fields.

It could be postulated that the trackway itself represents a later prehistoric routeway and boundary that has persisted into the Roman period. Given the general paucity of finds within these sorts of features, without the application of scientific dating techniques, most significantly OSL, the dating sequence remains uncertain and it may be that the chronological origins and dating sequence for parts of this wider site would be much earlier in date than is currently proposed. Excavations at another site, approximately 850m to the southeast (CAC 035), revealed fragmentary components of Late Bronze Age/Early Iron Age fields associated with an enclosed roundhouse or ringwork (Heard 2010), again suggesting the likelihood of pre-Roman fields and boundaries in this area. Whatever the origins of this major trackway or droveway it certainly seems to form an axial element in the Roman and later landscape. The trackway provided the northern boundary for the enclosures, ditches and hedge-line ditches relating to Roman activity. The line of the trackway became the focus for a major linear surface spread of material or midden during the second sub-phase of the Anglo-Saxon settlement (Lucy *et al.,* 336-9), indicating that the trackway must have still been a visible feature at this period, although it may have only been a slight hollow way running across the northern part of the site. The eastern end of the trackway also appears to merge with medieval to post medieval field boundaries, known from historic maps, the aerial photographs (Fig. 5.11), again suggesting a persistence of this as a major feature.

The current Carlton Colville and Gisleham parish boundary runs parallel to the western part of the trackway, 90m to its south (as indicated by the CAC 042 excavation and cropmarks). Cropmarks to the west suggest a possible continuation of a trackway or boundary following this alignment (CAC 079 and MUD 029; Fig. 5.12) and again the same spatial relationship with the parish boundary is present in places. Areas of fields and boundaries (CAC 065 and

GSE 077) broadly parallel to this trackway and/or significant boundary were identified on the aerial photographs to the immediate north and south. GSE 077 consists of a rectilinear enclosure and at least two phases of fields, at least some of which are medieval to post medieval. Numerous Roman finds (GSE 036, GSE Misc) and Middle to Late Saxon material (GSE 019, GSE 035, GSE 036, GSE 040), have been found within the general vicinity of the cropmarks, although some of the latter may represent activity associated with the settlement of Gisleham to the immediate east. The morphology of the main cropmarks would fit with a broadly Roman date, although as illustrated above, there is potential for some elements to be earlier.

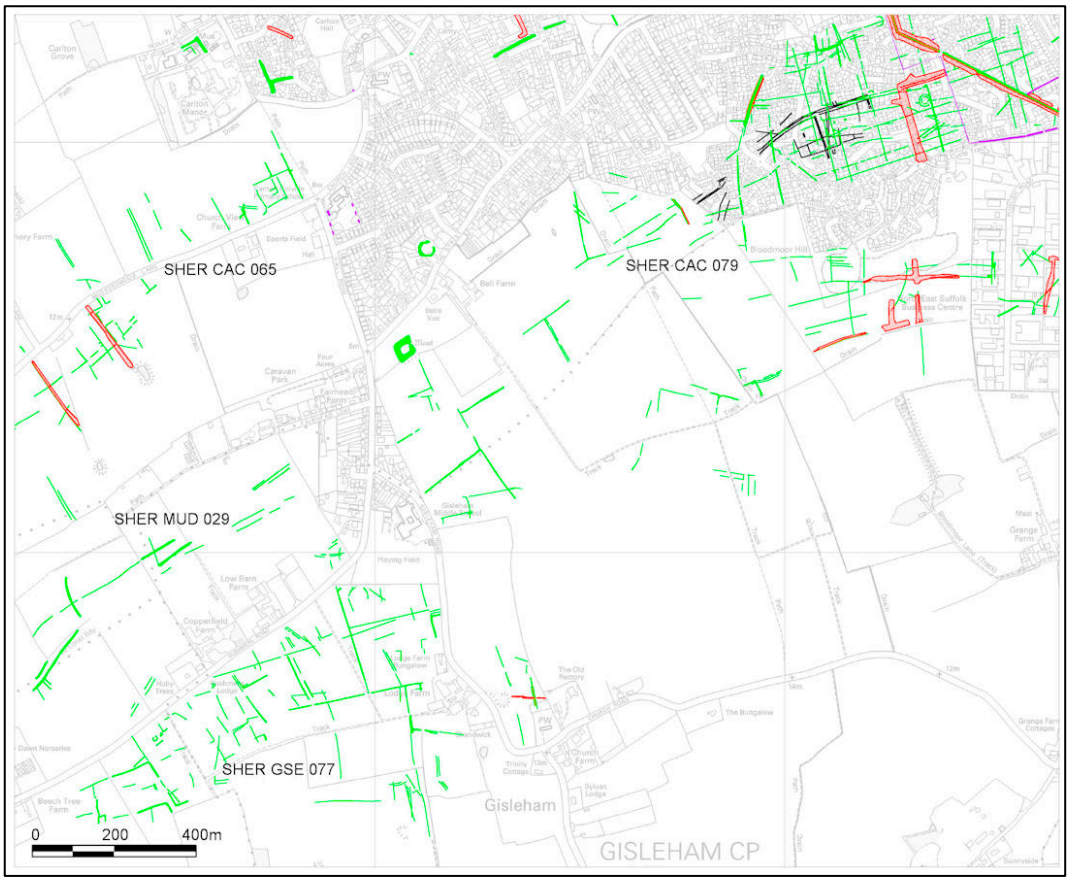


**Figure 5.12. Cropmarks of enclosures, fields and boundaries within the northern part of the AONB Study Area. A Roman (or earlier) origin is suggested for significant components of this landscape, but with alignments and major boundaries persisting into the historic period. Schematic excavation plans shown in black; see Fig 5.11 for details and sources.**

### 5.3.3 Roman and Medieval to Post Medieval

To the north of the Bloodmoor Hill site is another area where developer-funded excavations have coincided with field system evidence recorded from aerial

photographs (CAC 063). Located on a slight rise the to the north of the Lowestoft Road an area of enclosures, fields and trackways (Fig. 5.13) covers the area of a number of archaeological evaluations and resulting sites (CAC 026-027 and CAC 029). This includes evidence for enclosures of both Roman and medieval date (Meredith 2005) that correspond with some of the features visible on the aerial photographs. As with the Lothingland complexes described above, it is hard to clearly differentiate between the medieval components and those likely to be earlier. Combined with the excavation evidence a complex pattern of continuation and/or periodic reuse is perhaps indicated.


**Figure 5.13. The cropmarks of enclosures, fields and trackways mapped to the east of Carlton Hall (CAC 063), assumed to be largely medieval to post medieval in date due to historical map evidence. Excavations at the site, however, indicate a Roman origin for some elements. Excavated ditches are shown in black, line of projected ditches as per SCCAS interpretation shown in brown. (Source for excavation data Martin *et al.* 2003, 351–3; Meredith 2005.)**

The cropmarks are located on a strip of land that is bordered by Whitton Green to the north and Carlton Green to the south, and appear to be cut by the road

running east from Carlton Hall and St Peter's church, which formed the edge of Whitton Green, a green-edge settlement (Meredith 2001), on Hodskinson's map of 1783. The lane, of probable medieval date, visible on historic maps and the aerial photograph evidence, was not detected within the excavation, suggesting a level of truncation at the site (Meredith 2001). The aerial photograph evidence indicates that this main axial trackway and/or boundary feature (which remains as an extant boundary until as late as the OS 1st edition map), appears to form an integral part of the mapped enclosures and fields, some of which are depicted on the 1842 Tithe map (Newman 1998). The aerial photographs also indicate further boundaries and enclosures, not shown on the historic maps. Whilst many of these may relate to boundaries of medieval to post medieval date, gone out of active use by the mid-19th century, the excavations at the site suggest that at least some of these ditches may be Roman in origin. Excavations in 2002 revealed a square enclosure of Roman (or Iron Age/Roman) date, which itself overlay an area of prehistoric structures and activity (Martin *et al*. 2003, 351-3). Also set within the enclosure was a post–built structure of Middle Saxon date (*ibid*.), which again indicates the continued use of the site in the post-Roman period.

The aerial photographs suggest that the eastern boundary of this Roman enclosure may have continued north (Fig. 5.13) to form another square enclosure. A possible low mound and soilmark of a former Bronze Age round barrow, with encircling ring ditch, has been recorded within this enclosure (CAC 010). The identification of the mound itself is uncertain and it is therefore feasible that the circular soilmark relates to masonry or a floor surface associated with a building within the enclosure. Given the possible association with the excavated Roman enclosures it is tempting to interpret this as a Roman temple or similar structure, although the relationship with the square enclosure is uncertain and there is nothing to indicate contemporaneity and therefore a medieval or later windmill site must also be considered. The alignment of part of the excavated Roman enclosure appears to be reflected in the surrounding field layout. Whilst it is tempting to see these cropmarks as part of an earlier landscape associated with the Roman enclosure, it must be acknowledged that many of these boundaries also sit well within the network of fields depicted on the 1842 Tithe map (Newman 1998). The excavation to the east of these cropmarks (CAC 027) (Martin *et al*. 2003, 351-3), bordering the edge of Carlton Green, of medieval ditches, a possible enclosure and structural remains which follow the same

alignment as the majority of the cropmarks, all indicate significant post-Roman enclosure and activity – as also indicated by the Middle Saxon structure. The vast majority of the cropmarks may relate to an extension of the green-edge activity and enclosure around Whitton Green.

Without further excavation evidence it is hard to know how many of these fields and boundaries are pre-medieval in origin. Certainly some of the alignments set out in the Roman period would appear to persist throughout the medieval and post medieval landscape. Excavations at Burnham in North Norfolk revealed that late Anglo-Saxon open field furlongs had developed within a much more ancient network of enclosed fields, of possible late Iron Age date (Williamson 2006, 50). However, while the NMP mapping alone can only be dated by morphology, analogy with other sites, and interpretation of relationships in the landscape, both with and without additional evidence from developer-funded excavations, the results of the project have shed considerable light on the existence, nature, extent, character and possible development of the field systems within the project area.

# 6. Research Theme: Lowestoft in World War Two

As Britain's most easterly point, Suffolk had a crucial role to play both defensively and offensively during World War Two. With its proximity to the continent, and its many miles of low-lying beaches providing potential landing points, it was perceived as especially vulnerable to invasion. The vulnerability of both Suffolk and the region as a whole was such that Eastern Command became the most heavily defended area in the country outside the London District and Aldershot Command (Dobinson 1996, 55). Furthermore, Suffolk was the location of a number of important military bases and installations, including its ports (several of which became substantial naval bases), the research stations at Orfordness and Bawdsey (where radar was developed) and, particularly later in the war, its many airfields.

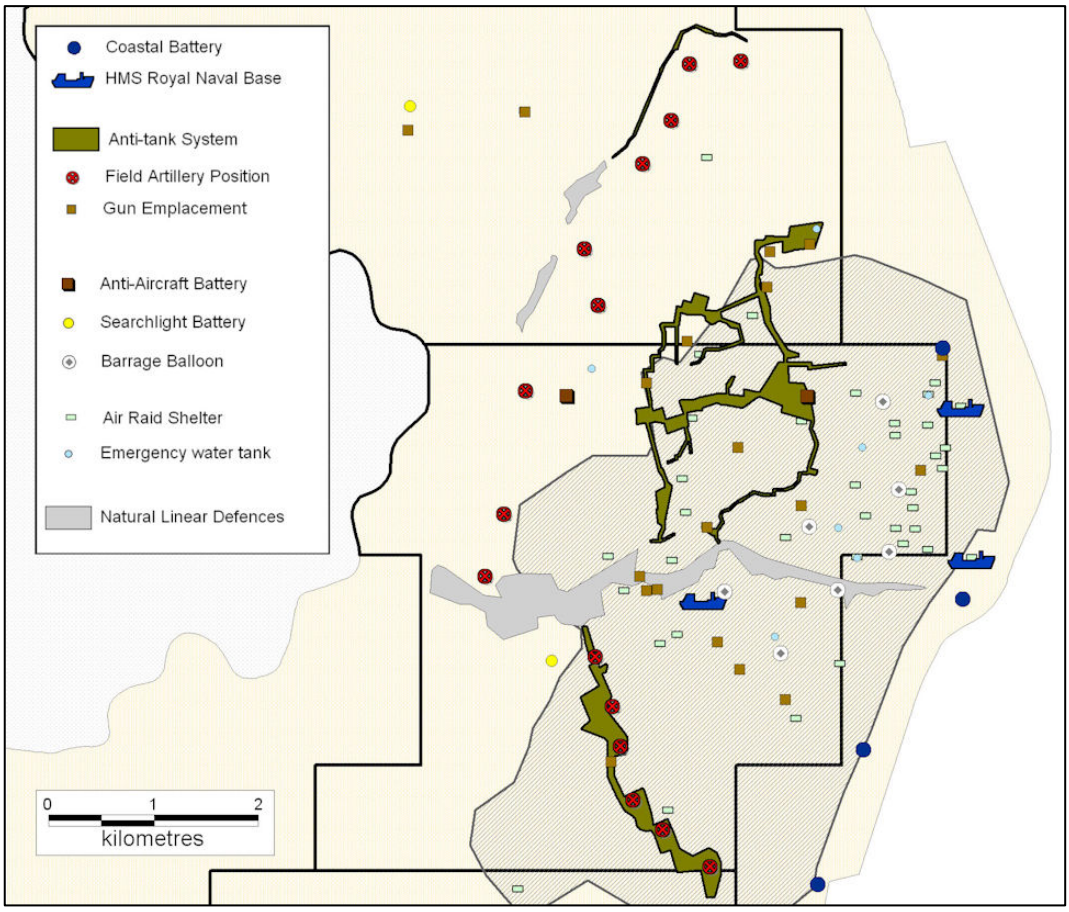


**Figure 6.1. Location of principal World War Two sites mapped at Lowestoft; the identification of field artillery positions is in part extrapolated from information in Liddiard & Sims 2014a.**

One of these sites – the port of Lowestoft – falls within the project area and it is the defences and installations of this town, which extended for several kilometres into the surrounding area, that are the subject of this chapter (Fig. 6.1). Its seaward side had been mapped as part of the earlier Suffolk Coast NMP (EH Project 2912), but the project discussed in this report represents the first time that contemporary and later aerial photographs have been used to record the 20th-century military archaeology of the town itself and its wider environs, away from the coastal strip. Suffolk's World War Two defences have also been the subject of a recent European Union Interreg IV 'World War II Heritage' project (www.worldwar2heritage.com), one of the outputs of which has been the publication of a series of excellent guides (Liddiard & Sims 2014a–d); the latter have been invaluable in the interpretation of the NMP results presented here.

## 6.1 Background

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). Initially under the control of General Kirke, home defence was subsequently directed by General Ironside, who replaced Kirke as Commander-in-Chief of the Home Forces in June 1940. He pursued the policy of constructing a 'coastal crust', a static, linear defence to protect against attack and invasion from the sea. When Ironside was replaced by General Brooke only a month later, in July 1940, a radical shake-up of coastal defences took place (Liddiard & Sims 2014a, 40), with the emphasis now being on all-round defence, along with the creation of an 'Inner Defence Line' (Liddiard & Sims 2014d, 34). Where possible the earlier 'coastal crust' defences were integrated into the new design. Lowestoft was provided with new defences on its landward side, including a large anti-tank ditch (ATD), stretching from Southwold to Corton, while the beach defences were strengthened with beach scaffolding and additional minefields, anti-tank blocks and barbed wire. With these provisions, the town was expected to withstand an invasion whether by sea or, on its landward side, by an invasion force that had landed by plane or parachute. The town was completely surrounded by Forward Defended Localities (FDLs), heavily defended self-contained islands that could withstand an invasion long

enough for troops to be brought up from elsewhere (Liddiard & Sims 2014a, 40-2). By 1942, the defence of Lowestoft, rather than the whole coastline, had become the priority. In the same year, the focus of the war changed, with offensive operations taking over from defence. As the level of threat diminished, so many of the coastal defences ceased to be operational, or were manned by only small numbers of troops (or the Home Guard). Some of the beaches were reopened to holidaymakers as early as August 1944, with many others opening in the summers of 1945 and 1946, often while the coastal defences were still being removed (*ibid*., 43-4).

Lowestoft's World War Two sites, as recorded by the project, can be grouped into a number of categories – naval bases, Emergency Coastal Batteries (ECDBs), field artillery, anti-invasion defences and air defence – each of which is described below. None of these categories is mutually exclusive, and all sites were subject to change over time, as the nature of enemy attacks, and of the Allied offensive, was adapted to different stages of the war. Nor should it be forgotten that the discussions below are focussed on the incomplete – albeit compelling – evidence visible on the aerial photographs, and those of the landward side of the town in particular. Although the results of the earlier Suffolk Coast NMP (EH Project 2912), and other surveys using other types of evidence, have been drawn upon, this does not purport to be a definitive account of Lowestoft during the period. Rather, it seeks to highlight the wealth of evidence visible on the photographs, the range of sites encountered, and the potential for parts of some sites to have survived intact to the present day.

## 6.2 Naval Bases

It is important to stress Lowestoft's role as a strategic port during World War Two; indeed, with the advent of war, the town was 'transformed from a depressed and moribund seaport into a naval base of vital importance' (Kent 1988, 167). Lowestoft became home to five Royal Navy establishments, including the headquarters for the Royal Navy Patrol Service (RNPS), located at HMS Europa, the former Sparrow's Nest Theatre and gardens (LWT 323). This site was at first known as 'Pembroke X', the depot later becoming HMS Europa, and was the administrative headquarters for more than 70,000 men and 6,000 ships, including trawlers, whalers, drifters, MFVs (Motor Fishing Vessels), MLs (Motor Launches), and later MMS (Motor Minesweepers or 'Mickey Mouses'), American produced

BYMS (British Yard Mine Sweepers) and numerous requisitioned vessels. In addition to the main structures, many of which survive, the aerial photographs show that large numbers of huts and military buildings were positioned along the margins of the site and partially hidden within the tree line. Significant numbers of earth-covered air raid shelters are also visible.

A second naval base, HMS Mantis, is visible on aerial photographs at Hamilton Docks (LWT 321). The site was the base for the Royal Navy's Coastal Forces. Information from the Lowestoft Museum website (http://www.lowestoftmuseum.org/HMSMantis.html) states that the Headquarters buildings for Mantis were on the Hamilton Dock. The vessels attached to Mantis – MGBs (Motor Gun Boats), MTBs (Motor Torpedo Boats) and MLs – used Hamilton Dock itself, from where they set out for 'E-Boat Alley' off the East Coast to engage the German E-Boats. Officers were billeted at the Royal Hotel (now demolished) and the crews were mainly billeted in requisitioned houses in the Grove Road area. The aerial photographs show that large numbers of huts and military buildings were positioned along the sides of roads around the docks and that there were numerous earth-covered air raid shelters. Three large fuel tanks were located to the immediate north of the site, surrounded by a barbed wire obstruction.

The only one of Lowestoft's five naval bases to be sited fully within the project area, to the south of Lake Lothing, was HMS Myloden (LWT 297; Fig. 6.2). HMS Myloden undertook landing craft training for Royal Marine Commandos and Combined Operations and was located within the site of the old Silk Factory alongside the waterfront. Practical training was carried out at sea with craft regularly in transit on exercise between the base, Great Yarmouth and HMS Wolverstone, another landing craft training establishment on the River Orwell (http://www.oldlowestoft.co.uk/ajt/?The_letters_-_1944). The main features of the site are several groups of operational buildings and numerous pairings of huts, set within blast walls and arranged at angles to one another. These are likely to have provided accommodation for the naval troops, but may also have contained ordnance, such as torpedoes, shells and small arms. In addition numerous air raid shelters are evident on the photos, including a large area in which the entrances to subsurface shelters are visible. The large earth-covered shelters on the edges of the site may have served the local population and/or factory and dock workers. It is noteworthy that modern OS mapping and recent Google Earth

imagery suggests that, as with a number of World War Two sites in Lowestoft, some original components of HMS Myloden survive within the modern industrial landscape, in particular some of the blast walls and a few of the individual huts. A ground survey of the site would be beneficial to establish what structural remains survive intact, with a view to enhancing the HER and facilitating heritage protection (Appendix 1).

**Figure 6.2. HMS Myloden (LWT 297), situated to the south of Lake Lothing, which undertook landing craft training for RM Commandos and Combined Operations. RAF/106G/LA/21 RP 3051 04-JUL-1944 (EHA) Historic England RAF Photography**

The two remaining naval bases in Lowestoft, HMS Minos and HMS Martello, have proved more difficult to locate confidently. HMS Minos is thought to be the port of Lowestoft and HMS Martello was the local auxiliary patrol and mine-sweeping base. A number of large Nissen-type huts are visible on the aerial photographs surrounding Waveney Docks, alongside Battery Green Road and Waveney Road. It is reported that one of these large huts at the junction of these two roads may have been the administrative quarters of one or both of these establishments (Michael Sims, pers. comm.). There were also a number of fish merchants' offices alongside the Trawl and Herring Basins which were in Royal Navy use during World War Two, and could possibly have housed HMS Minos and/or Martello. The fact that existing buildings were so often requisitioned for use during World War Two has meant that sites were often not clearly visible on the aerial photographs. For instance, HMS Europa made use of buildings in the town including the former Empire Hotel in Kirkley Cliff which became the RNPS stokers' barracks, a girls' school in Church Road became the RNPS cookery

school and the officers mess was a detached house in Gunton Cliff (*ibid*., pers. comm.). The RNPS had a large number of administrative staff who drafted the much larger (approximately 70,000) operational members who passed though the town between drafts. During their brief stays in the town they would have been accommodated in lodging houses, the proprietors of which had been asked to return to the town after the voluntary civilian evacuation earlier in the war. In some instances whole roads of private houses were requisitioned for the accommodation of personnel; Grove Road and Beach Road were gated off from the rest of the town for the use of HMS Mantis ratings, for example (*ibid*., pers. comm.). There were also many stores and workshops all over the town in use for the maintenance and repair needs of the operational bases, and a naval sick bay in St Margaret's Road.

## 6.3 Coastal Batteries and Emergency Coastal Batteries

The fall of Holland in May 1940, and the intensification of the invasion threat (or at least Britain's perception of it) precipitated a major change in coastal defence strategy. It was apparent that the Royal Navy could not guarantee protection against enemy landings, and the decision was taken to treat the coast as a linear frontier, rather than concentrating solely on the defence of ports and harbours (Dobinson 2000, 58). To this end, a series of Emergency Coastal Defence Batteries (ECDBs) were planned and built around the coast of the United Kingdom, to supplement the existing Coastal Batteries.

At Lowestoft four ECDBs were constructed, three around the port with a further battery to the south. The sites comprised the Lowestoft or 'Kent' Battery (LWT 050) at Gunton Cliff, the South Pier Battery (LWT 322) and the Grand Hotel Battery at Pakefield (LWT 320). A further major battery was located further south in Pakefield (GSE 053). They all fulfilled slightly different defensive roles. The South Pier battery's main function was protection of the harbour; the Grand Hotel battery covered the harbour entrance and the South Roads, and the Lowestoft or 'Kent' Battery undertook 'Examination Service', controlling entry into the port and firing on unidentified vessels approaching it (Liddiard & Sims 2014a, 10–12).

The site of the Lowestoft or 'Kent' Battery (LWT 050) is clearly visible on aerial photographs, located at Gunton Cliff. As at many other ECDB sites, such as Aldeburgh Emergency Battery (Hegarty & Newsome 2007, 53–5), the aerial photographs reveal changing arrangements and configurations of gun houses

and artillery throughout the war. Frequently the sites were initially supplied with old Naval ordnance, taken from World War One ships, which was positioned within temporary gun houses; later in the war these were replaced with more permanent structures and different artillery. Aerial photographs of Gunton Cliff in 1940 show five gun emplacements on the road to the north of Lowestoft Denes. Of these, three are of a similar type, while the other two appear to still be under construction. By August 1941, only these two, apparently later, gun emplacements are visible. In addition to the gun emplacements, the associated command post and operational rooms are visible as a large camouflaged structure. Additional World War Two structures are visible to the rear of the site. The Coastal Artillery Searchlights (CASLs) associated with these guns and other probable defended positions are visible set into the cliff face. Additional barbed wire obstructions and roadblocks can also be seen.

The sites of the other three ECDBs – South Pier (LWT 322), Grand Hotel at Pakefield (LWT 320) and Pakefield (GSE 053) – fall outside of the area covered by the project. It is notable that the gun casement for the northern gun at the Grand Hotel battery in Pakefield (LWT 320) survives in use as a cliff shelter (Kent 1988, 172) and is visible on Google Earth's most recent photography (from 2006).

## 6.4 Field Artillery

As well as the pillboxes, anti-tank cubes and other concrete obstacles of the coastal crust, batteries of field guns were located behind the lines as a part of the anti-invasion defences. They were intended to fire upon enemy troops who had managed to land on the coast and move ashore. Due to Lowestoft's status as an important port, the Southwold to Lowestoft area was allocated proportionally more artillery for its defence than other parts of the coast, and by October 1940 there were reportedly 24 guns in this area (Liddiard & Sims 2014a, 33).

The siting of field artillery was undertaken with great care. There were three lines of field artillery, one on the coast, and two further gun lines back from the coast itself. The project recorded four such sites within Lowestoft, one of which (LWT 280) is visible camouflaged within a quarry (Fig. 6.3). The site is visible as four angular 'lozenge' shaped gun emplacements that presumably contained field guns. The three other Lowestoft sites (LWT 280 and LWT 306–307) also possessed similar arrangements of guns. Similar gun batteries in other parts of

the country were constructed out of sandbags filled with concrete, with a concrete roof placed on top (Roger Thomas, EH, pers. comm.).

**Figure 6.3. A field artillery position to the west of Lowestoft (LWT 280), visible camouflaged within a quarry. RAF/106G/UK/821 RV 6092 21-SEP-1945 Historic England RAF Photography.**

Due to the great importance of Lowestoft it was also provided with inland artillery 'SOS' positions or 'Defensive Fire Tasks' to protect the main roads into the town (Liddiard & Sims 2014a, 34–7, fig. 37). Military records indicate that the landward sides of Lowestoft were surrounded by a chain of these SOS artillery positions (*ibid*.), four to its north and four to its south. To the north, these field artillery units are likely to equate to the groups of 'Section Posts' (FTN 015, BLN 045, COR 002) identified by the project on the seaward side of the Blundeston to Corton ATD system (COR 035) (see too Section 6.5 below). To the south, they appear to broadly coincide with defended positions, again on the seaward side of the ATD (LWT 284). These defended points, along with some additional locations along

the ATD line, appear to have become Forward Defended Localities (FDLs) as part of the Brooke's all-round defence strategy (Liddiard & Sims 2014a, fig. 42).

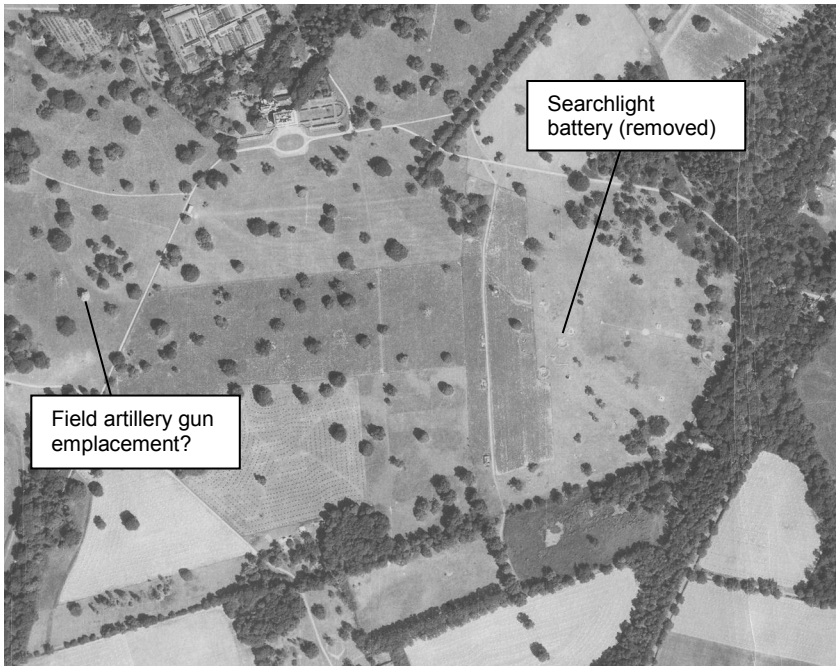


**Figure 6.4. Henham Park in 1945, showing a possible field artillery position (WNF 063) along with the remnants of a searchlight battery site (WNF 045). RAF/106G/UK/602 RP 3013 04-AUG-1945 Historic England RAF Photography**

This scheme of defence extended for a considerable distance beyond Lowestoft itself (Liddiard & Sims 2014, fig. 37). Approximately 17.5km south-southwest of the town, earthworks in Henham Park (WNF 045) indicated the existence of a searchlight battery and the possible location of a field artillery gun emplacement (WNF 063; Fig. 6.4). Henham Park was one of several field artillery locations sited across the AONB Study Area, to the south of the town. It is clear that the positions were sited with great care, taking into account the range of the guns and the need for forward observers, and that the sites were well-camouflaged (Liddiard & Sims 2014a, 34–5; Fig. 6.3). The fact that woodland was often chosen as the gun site, and that the guns themselves were camouflaged, can make these sites difficult to identify on aerial photographs. In addition, some field artillery was relocated by the end of 1941, when the ATD surrounding Lowestoft was constructed. The system of field artillery relied heavily on forward observers who would spot for their guns, and therefore observation posts were crucial to their effectiveness. The fact that observation posts were often located in existing tall buildings, such as Benacre church and the water tower on Benacre Park (Liddiard & Sims 2014a, 38), has also hindered their recognition and recording (Section 3.4). It is clear from a reading of Liddiard and Sims (2014a) that the

extent and significance of Lowestoft's scheme of field artillery sites has only recently been brought to wider attention. The work of the project to recognise, map and record the physical traces of some of these sites as visible on contemporary aerial photographs was usually the first time such evidence had been recorded in the SHER. The seeming neglect of this type of site by the heritage community is borne out (and aggravated) by the absence of a 'field artillery' thesaurus term for use within HBSMR.

## 6.5 Anti-Invasion Defences

As stated above, the Suffolk coastal area was at the forefront of East Anglia's defence during World War Two, in particular during the early years of the war when invasion – whether from the sea or by a force landing inland by plane or parachute – was a very real threat. As already described, emphasis was at first on a 'coastal crust' of defences, designed to repel an invasion force attempting to land on the coast. Inland, fortified nodal points and stop lines, constructed chiefly during 1940, formed a second line of defence (Liddiard & Sims 2014d). Later in 1941, with the replacement of General Ironside by General Brooke, there was a change in strategy, with a move away from static, linear defence to all-round defence employing a series of FDLs, integrated where possible with anti-tank defences (Liddiard & Sims 2014a, 40-42).

This change in strategy helped bring about the construction of the most extensive World War Two sites recorded around Lowestoft: long stretches of ATD and related defences. This defensive system, consisting of ATD, barbed wire obstructions, anti-tank scaffolding and lines of anti-tank cubes, and associated defences, including pillboxes, gun emplacements, slit trenches and weapons pits, is visible on aerial photographs encircling Lowestoft and running along this section of the East Coast from Corton to Pakefield (LWT 309), extending up to 4km inland and covering a distance of nearly 22km (Fig. 4.9). The defence was split into two sections, with Lake Lothing and Oulton Broad forming a natural break in the defensive line. The northern section surrounded the northern perimeter of Lowestoft, from the Lowestoft Denes to Lake Lothing and Oulton Broad (LWT 045) and the southern section ran south from Oulton Broad, Lowestoft, to Pakefield (LWT 284 and GSE 045). For the most part, the defensive line was formed by a ditch, with associated intermittent bank (REY 099) (Fig. 6.5). In places, other features were employed in place of, or as well as, the ditch.

**Figure 6.5. A section of the anti-tank system surrounding Lowestoft (LWT 284), showing an area of defences including anti-tank cubes, slit trenches and section posts; the latter appear to have become Forward Defended Localities (FDLs). RAF/106G/UK/927 RVp1 6033 16-OCT-1945 Historic England RAF Photography.**

Some of the specific defended points associated with this anti-tank system were recorded separately (for example LWT 194–198 and LWT 283), whilst others, in particular small isolated structures, such as an embanked gun emplacement at TM 5221 9428, were included within the larger site. Further defensive positions were recorded in the wider area, including barbed wire defences and slit trenches on the edge of the marshes on the western side of Lowestoft (LWT 293) and further slit trenches, defended positions and military structures at Broadacres to the south (LWT 294). To the north, barbed wire defences, gun pits and possible structures are visible at Holly Hill on the edge of the marshes (OUL 021), in close proximity to the heavy anti-aircraft battery mentioned below (OUL 019). These

defended positions relate to the FDL marked on a 1942 plan of infantry defence in Lowestoft (Liddiard & Sims 2014a, fig. 43), and were sited as part of Brooke's 'all round defence' strategy to protect Lowestoft from an inland attack across the marshes.

Similarly, several sections of ATD (LWT 045, COR 035) and related defences (for example, BLN 045), protected Lowestoft from an attack from the north. A group of World War Two defended trench positions or 'section posts' (Roger Thomas, EH, pers. comm.) are visible positioned on the seaward side of the ATD system (COR 035). These form part of a wider system along the northern side of Lowestoft, along with examples on the coast (COR 002, COR 040 – which were previously erroneously recorded as bombing decoys) and another group to the south (FTN 015). The location of these posts corresponds to the 1941 SOS Field Artillery locations and the 1942 infantry FDLs shown in Liddiard and Sims (2014a, fig. 37 and fig. 43 respectively; see too Section 6.4 above). Their location on the seaward side of the ATD indicates that they too were sited to protect the town from an invasion on its landward side.

Within the town itself, and on roads leading into it, roadblocks were erected to control traffic, and impede an invading force if necessary. These were recorded at ten sites within the project area.

## 6.6 Air Defence

As an important port and Naval base, Lowestoft was felt to be a target for German bombing campaigns, and indeed 83 separate raids on the town were carried out, killing nearly 300 people. It was designated a 'Gun Zone', and provided with four Heavy Anti-Aircraft (HAA) batteries, in addition to numerous Light Anti-Aircraft guns (Liddiard & Sims 2014a, 8). Barrage balloons and searchlight batteries provided passive defence.

The sites of four HAA batteries were mapped by the project, at Barnby (BNB 013), Lound (LUD 048), Lowestoft (LWT 256) and Oulton (OUL 019). At several sites, and particularly at Lound, parts of the battery appear to still survive. At Oulton, and Barnby, parts of the accompanying accommodation sites may also survive. Seven barrage balloon sites and three searchlight batteries were also mapped by the project, the former clustered in and around Lowestoft, the latter more widely spread across the project area. One of the barrage balloon moorings

(LWT 247) is visible close to substantial earthen-covered communal air raid shelters and an extensive area of camouflaged factories (Fig. 6.6). This was the former Eastern Coach Works site on what is now the North Quay retail park. It is likely that the factory closed down whilst production ceased during the war, but that the building was requisitioned for military use; the presence of camouflage on the roof of the buildings at the site may confirm this (see too Section 6.7 below).

**Figure 6.6. The site of a barrage balloon mooring (LWT 247), substantial earth-covered communal air raid shelters and an extensive area of camouflaged factories at the former Eastern Coach Works site, Lowestoft. RAF/106G/LA/21 RP 3053 04-JUL-1944 Historic England RAF Photography.**

## 6.7 Civil Defence

The Munich Crisis of 1938 heightened fears of aerial bombardment, and highlighted the need for civil defence, which prompted the digging of many shelters in back gardens, parks and school grounds all over the country. Domestic surface shelters, for areas without gardens, and Anderson shelters for those with enough space were erected in great number and, as a result of the Baedeker Raids and the Fringe Target Raids in the two years following 1942, growing numbers of domestic and public air raid shelters are visible on aerial

photographs of Suffolk (Hegarty & Newsome 2007). Communal shelters became increasingly important, both in a domestic and a commercial or industrial setting, particularly in a town such as Lowestoft where domestic space was at a premium.

Present at 50 of the sites recorded by the project, air raid shelters were visible both in military contexts (at the naval bases and military camps), and in commercial or industrial settings, for example beside camouflaged factories. Of the latter, perhaps the most notable is the site of a World War Two barrage balloon mooring, LWT 247, where substantial earthen-covered communal air raid shelters and an extensive area of camouflaged factories were recorded at the Nobel Chemical Finishes Eastern Coach Works on the site of the North Quay retail park. An unusually long curved profile hut was located along the western side of the factory complex. It is assumed that this had a specialised function, potentially to do with the manufacturing and finishing of items or equipment associated with the war effort. The large air raid shelter presumably provided protection for the factory workers. Earth-covered and surface shelters were also recorded in a civil defence capacity. Due to their ubiquity and restraints on time, private Anderson shelters were not recorded systematically.

The Air Raid Precautions (ARP) Department of the Home Office was formed in 1935 (Hegarty & Newsome 2007), and during World War Two, the ARP was responsible for the issuing of gas masks, pre-fabricated air-raid shelters (such as Anderson shelters, as well as Morrison shelters), the upkeep of local public shelters, and the maintenance of the blackout. At least four possible Air Raid Wardens' posts were identified in Lowestoft (LWT 233, LWT 300, LWT 303, LWT 312). The Air Raid Precautions Control Centre (LWT 179), was also visible on aerial photographs, surrounded by a substantial blast wall. This was the only site which has been recorded as a Cold War site, refitted in 1953 as a Cold War control centre and remaining in use as such until 1968.

Six emergency water tanks were recorded by the project (LWT 211, LWT 214, LWT 232, LWT 254, LWT 260 and LWT 303), again clustered in and around Lowestoft. They would have provided water for firefighting following bombing raids. Two further examples (LWT 201, OUL 020) were recorded within military camps.

## 6.8 Conclusion

The port of Lowestoft, Britain's most easterly point, had an important role to play in the defence of East Anglia in World War Two. As such its defences were crucial to the protection of its hinterland, and their study has much to add to our knowledge of World War Two defensive strategy. Following on from the results of this project, it is clear that the wealth of World War Two remains in the Lowestoft area warrants further research, including an assessment of those sites were remains may still exist, to inform further research and heritage protection measures (Appendix 1).

The results of the NMP mapping, together with those from other projects, in particularly the European Union funded 'World War II Heritage' project, are enabling a clearer picture to be built up of the extent of the World War Two defences within and around Lowestoft, one of the Suffolk coast's most important military assets at the time. The Royal Navy sites in particular are of great interest in the context of their involvement in the 'Battle of the East coast' (Liddiard & Sims 2014a), some 28 Lowestoft vessels being lost during the conflict.

As discussed above, however, many World War Two sites in Lowestoft were requisitioned civilian buildings which were not easily identified on the aerial photographs. For instance, three battalions of a number of different regiments of infantry were billeted in the town throughout the first half of the war when invasion seemed likely. The holiday camps and many of the larger buildings in Lowestoft and Oulton Broad were requisitioned, the Kitchener home in Kirkley Cliff was in use as an R&R establishment for the Women's Royal Naval Service (Michael Sims, pers. com.), as well as the many buildings put to use by the Naval bases in the town. Unfortunately, there will always be facets of the historic environment which remain 'invisible' to aerial photography. However, at the same time, the project's use of photographs spanning more than 70 years has enabled not only sites in use in the 1940s to be identified and characterised, but also elements of those still visible in the '90s, '00s or even 2010s to be noted in the record. This last information has informed the compilation of a list of sites to be considered for further work and/or heritage protection (Appendix 1).

# 7. Research Theme: Earthwork Visibility and Survival within the Project Area

## 7.1 Background

Heathland, both former and extant, is one of the defining characteristics of the Suffolk coastline and coastal hinterland. It is a particular feature of the area historically referred to as the 'Sandlings', which is now encompassed by the SC&H AONB. These heathlands, protected from ploughing, have the potential to have conserved earthwork sites, a comparative rarity in eastern England and a clear priority for heritage protection both within the region and nationally.

There are specific issues relating to the identification and protection of heritage sites within heathland. The nature of the vegetation cover can make it difficult to identify sites, both on aerial photographs and on the ground. Even when sites have been identified, during previous surveys or site visits, or from aerial photographs, these can be difficult to find without accurate maps and GPS equipment. The NMP methodology, which utilises a wide range of airborne data collected over a long timespan (usually more than 70 years), maximises opportunities to identify sites when vegetation cover is low and surviving earthworks more visible. It also provides detailed, georeferenced digital mapping, ideal for using to locate sites on the ground using GPS. This mapping is usually accurate to +/-2m, although a scarcity of suitable control points, often a problem in heathland areas, can reduce this.

A second problem is that fragile heathland soils are easily disturbed, meaning that any surviving earthworks are easily damaged or destroyed. The needs of environmental conservation – a priority within designated landscapes such as AONBs, where key habitats are actively managed – often puts their survival at risk. Ground disturbance relating to heathland restoration can include tree felling, scrub and heather clearance, turf and litter stripping, deep ploughing and rotovation, and this represents a significant heritage protection issue for heathland areas. Where available, NMP data can play an integral role in devising strategies to minimise the impact of such work on the historic environment. It can be of particular value within AONBs and other designated landscapes, where extensive management plans are in place and where it can inform an integrated strategy for heritage and environment conservation.

Designated landscapes such as the SC&H AONB may thus conserve earthworks by protecting the heathland landscapes on which they have survived, at the same time threatening them through ground disturbance undertaken for habitat management, but also offering good opportunities for long-term integrated management. As a consequence, the identification of new earthwork sites and the enhancement of records for those previously recorded, especially on heathland and within the AONB, was an important focus for the project. However, it was clear from the outset that there were relatively few remaining areas of coastal heath within the project area, this landscape type being more typical of the central and southern parts of the AONB (Horlock 2012, 13); the latter are the subject of a new NMP survey (NHPCP Project 7035), which has started recently. Nonetheless, evidence provided by land use classification mapping undertaken in the 1930s, known as the Dudley Stamp Survey or Land Utilisation of Britain Survey, indicated that the margins of coastal heaths survived within the project area at this date, and that therefore there was some potential for recording archaeological earthworks surviving on these areas from historic, 1940s aerial photographs.

## 7.2 Results

Overall, the project recorded 157 sites that contained an earthwork or levelled earthwork element (Fig. 3.2). This equates to approximately 26% of all sites recorded. For comparison, within the NMP dataset from Norfolk, 35% of recorded sites contain an earthwork or levelled earthwork element. This suggests that the proportion of earthwork/levelled earthwork sites recorded by the project was quite low, but it is difficult, without more detailed analysis, to know how representative – and comparable – these figures are.

Sixty-one, or 39%, of the earthwork sites were recorded in the AONB Study Area; this was the largest Study Area, however, and in terms of density it in fact supported the lowest incidence of earthwork sites – 0.97 per sq km compared to 2.67 in the Lowestoft Study Area, 1.13 in the Lothingland Study Area and 1.33 per sq km overall. At the same time, approximately 62% of the earthwork/levelled earthwork sites recorded by the project relate to 20th-century military and defensive sites, the vast majority of World War Two date. Once these are removed, the significant bias towards the Lowestoft Study Area disappears, with the latter supporting a density of only 0.27 pre-20th century earthwork sites per

sq km, compared to 0.58 per sq km and 0.57 per sq km across the Lothingland and AONB Study Areas respectively.

In conclusion, while the project has recorded a significant proportion of earthwork and levelled earthwork sites, there is no evidence of a higher number of such sites being recorded in the AONB Study Area. This confirms the initial assessment of the area as containing relatively little heathland, where earthwork sites might be expected. There is also no evidence of a correlation between those sites that were mapped and areas of heathland mapped as part of the Dudley Stamp survey. Whether there will be a marked difference between the results of this project and those of the NMP project that has recently started to cover the remaining unmapped parts of the AONB (EH Project 7035) remains to be seen, but the fact that large tracts of heathland still survive within the new project area suggests that the variation between the results of the two projects could be considerable.

## 7.3 Earthwork Sites

Of the earthwork and levelled earthwork sites recorded by the project, a number of sites stood out as being of particular archaeological importance (or, at least, potential importance). One possible non-funerary site is represented by an area of earthwork enclosures of unknown date within Mutford Big Wood, an area of ancient woodland (MUD 025) depicted on Hodskinson's map of 1783 (Figs 7.1 and 7.2). It is possible that the enclosures relate to stock management or other activities within the woodland during the medieval to post medieval period. The dimensions and level of subdivision within the earthworks would indicate that they are unlikely to relate to more recent compartments within the woodland, such as those associated with plantation or management of the area within the post medieval and modern periods. Additionally they are clearly cut by other more recent plantation features. Given that the orientation of these earthworks broadly follows that of the surrounding medieval to post medieval landscape a relatively late date could be assumed, although the morphology of the enclosures could equally suggest a later prehistoric or Roman date; it is feasible that earthworks of this antiquity could have been preserved within an area of ancient woodland. A later prehistoric, Roman or medieval to post medieval date has therefore been suggested. Further research and ground survey is required to fully understand and interpret these features.


**Figure 7.1. Earthwork enclosures (MUD 025) of uncertain date and function within ancient woodland, Mutford Big Wood.**

**Figure 7.2. Earthworks in Mutford Big Wood (MUD 025). RAF/540/465 RS 4181 20-APR-1951 Historic England RAF Photography.**

The same is true of a curving boundary ditch or hollow way (ASY 002) that appears to define the upper edge of a cropmark field system, of possible late prehistoric or Roman date, formerly on common and/or warren land, within Ashby Warren in Lothingland. The route is visible as an earthwork as late as 1951 and sections of this may survive within the now wooded Ashby Warren. This route is

possibly associated with a stock enclosure and/or domestic site and could feasibly represent a rare survivor of the complex network of later prehistoric and Roman fields and trackways that characterise the archaeology of Lothingland (Section 5), but are now almost entirely reduced to cropmarks.

Two possible deserted medieval settlement sites were recorded by the project, both within areas of parkland. In Benacre Park (BNC 001), an area of possible settlement appears to have been enclosed by the post medieval park, and includes several trackways, and a possible area of ridge and furrow within fields. In Henham Park (WNF 052), fragments of former earthworks may represent the site described as 'moat and earthworks of Henham village in Tuttles Wood' (HAM 005).

The site of former earthworks of probable medieval to post medieval date (BLN 037) was visible in the grounds of Blundeston Lodge (BLN 021), now the site of Blundeston Prison. The site consists of bank and ditch boundaries, some of which may relate to pre-Lodge agricultural activity. It is also feasible that some of the mounds and platforms identified relate to the sites of former structures, although this is uncertain given the lack of clarity of many of the earthworks.

A list of sites where further work or heritage protection measures are recommended, many of them surviving (or potentially surviving) earthwork sites, is given in Appendix 1.

# 8. Heritage Protection

## 8.1 National Frameworks

Identifying key heritage assets and providing protection for nationally important monuments and sites through designation is a crucial part of the heritage protection process. NHPP (English Heritage 2012; soon to be replaced by Heritage 2020), combined with the National Planning Policy Framework (Department for Communities and Local Government 2012) enables them and local planning authorities to provide a streamlined and efficient approach to managing and protecting the historic environment. Existing NMP data within Suffolk is already being utilised heavily for both strategic planning and on a 'site-by-site' basis for providing planning advice and mitigation (Dr Richard Hoggett, SCCAS, pers. comm.)

The broad-based geographical and multi-period approach of NMP survey and the resulting thematic accounts and syntheses can feed directly into two of the eight core aims identified by NHPP – Measure 3: 'Recognition and Identification and of the Potential Resource' and Measure 4: 'Assessment of Character and Significance' – but can also make a significant long-term contribution to many of the other strands. The results of NMP can play an important role in the heritage protection process by providing detailed and accurate mapping of the location and extent of existing and potential designated sites and by assessing their significance and recording their condition through time. The NMP mapping and recording can also highlight new sites which may be suitable for designation, for example see Section 8.2.1 and Appendix 1.

The level of site description and interpretation offered by the NMP records, combined with an accurate site plan and indication of the extent of monuments, has many obvious benefits for heritage management. Information derived from NMP is proving invaluable to historic environment professionals providing land management advice in Suffolk (Dr Richard Hoggett, SCCAS, pers. comm.). The existing Coastal NMP data for Gunton Warren – just to the north of Lowestoft and bordering the current project area – is being used by Suffolk Wildlife Trust, in liaison with SCC, to actively manage the remaining World War Two heritage at the site (*ibid*.). This includes the remains of a 'Diver Strip' anti-aircraft battery

(LWT 062), which in June to September 1944 formed part of a defensive strategy aimed at combating the V-1 flying bombs.

The predominantly agricultural economy and land use with Suffolk means that NMP information has great potential for feeding into agri-environment schemes and management strategies. NMP also offers substantial and obvious benefits to the owners and managers of large landholdings. Nearly 40% of the project area is part of the SC&H AONB designated landscape, for which an integrated management plan and policy and plan is produced (currently SC&H 2013). The NMP mapping and resulting HER records will feed into future formulations of this policy and inform decisions regarding the historic environment of the area. It also supports the recently signed accord between EH and the National Association for AONBs (see http://www.landscapesforlifeconference.org.uk/2014/07/renewal-and-signing-of-the-accord-between-english-heritage/).

The management of heritage assets within the AONB area offers both unique opportunities for site investigation, preservation and presentation, and unique threats. The digital NMP maps and records are ideal for feeding into the planning of land management regimes, providing accurate depictions of the location and extent of individual sites and features, often for the first time. The enhancement of the existing archaeological record, through the identification of new sites and the provision of new information about those previously identified, allows both the agencies involved and heritage advisors to be better informed in their assessment of significance and vulnerability.

## 8.2 Monument Management and Heritage Protection in the Project Area

The NMP mapping has the potential to affect monument management and heritage protection in a number of ways. The provision of accurate locational information for monuments themselves, along with interpretative text and discussion and information about their wider landscape context, is essential to ensure the continued protection of regionally and nationally significant and designated sites.

Due to the low incidence of Scheduled Monuments (SMs) within the project area the impact of the NMP mapping on this aspect of heritage protection has been limited. All four of the SMs relate to moated sites. At Blundeston Hall (BLN 001)

and ‘The Island’ (CAC 005), Carlton Colville, the aerial photograph evidence offered no information additional to that already provided by the OS mapping. At Gisleham Manor House (GSE 001) additional earthworks were recorded within and around the moated site, but are likely to add little significant information regarding the medieval core of the site. They may relate to post medieval clearance and maintenance of the moat and associated drainage features, and were consequently recorded separately (GSE 080). At the moated site in Moatyard Covert (HAM 001), Wangford with Henham, a slight extension to the moat, or an associated pond – feasibly a fish pond – and was added to the recorded plan of the site. Although the evidence was not conclusive, slight embankments were also tentatively identified on the moat platform itself. On the latest available photographs (2011) the area is tree-covered and it is therefore difficult to assess whether any of the earthworks survive.

### 8.2.1 Candidates for Designation and Recommendations for Further Work

Whilst this project has mapped numerous regionally (and in some cases arguably nationally) significant cropmark sites and landscapes, the potential difficulty in establishing details of the condition of buried sites revealed as cropmarks means that suitable candidates for designation cannot always be identified confidently from an NMP survey alone. An example is the site of a possible Roman villa newly identified from aerial photographs at Kessingland (KSS 090; Fig. 4.3), situated within elements of a possible Romano-British field system (KSS 091 and KSS 092). The recovery of Roman tile from the site (KSS 011 and KSS 013) and many other Roman finds including a horse and rider brooch and a disc brooch (KSS Misc), in conjunction with cropmark evidence of internal structures, would appear to support its interpretation as a villa. Although the condition of the sub-surface remains is not currently known, the cropmarks and finds together provide as much evidence as many other Scheduled Roman buildings for the potential survival of buried remains (Jude Plouviez, SCCAS, pers. comm.).

Due to its predominantly arable landscape, and the reduction of much of the county’s heathland during the 20th century, in common with much of eastern England Suffolk has relatively few surviving earthwork sites. One newly recorded earthwork site which stands out as being worthy of designation, is the group of conjoined enclosures within Ancient Woodland at Mutford (MUD 025; Figs 7.1

and 7.2). As described in detail in Section 7, the site is of uncertain date and significance, nevertheless its possible survival within an area of Ancient, albeit replanted, Woodland would make a significant addition to Suffolk's earthwork remains. However until further ground inspection and/or survey takes place, the fact that it was only recorded from one set of older aerial photographs – taken in April 1951 when a lower leaf density allowed visibility of the ground – means that the survival and significance of the site is uncertain, and it is feasible that some of the features recorded relate to woodland management, historic or modern paths, or non-archaeological activity.

The earthworks of post medieval (probably medieval to post medieval) fields and roads (SOL 015) recorded within Somerleyton Park may still survive as earthworks, as they are evident on lidar imagery from 2009 (Fig. 4.7). These require further ground survey and investigation. The location of the features within the context of a well-researched and documented historic landscape (Williamson & Taigel 1993), means that these features could be regarded as being of greater significance than might normally be attributed to components of the post medieval landscape.

Another earthwork (or group of earthworks) of potential significance is a curving boundary ditch, hollow way or track (ASY 002), on former common and/or warren land within Ashby Warren in Lothingland. This appears to define the upper edge of a field system, visible as cropmarks, of possible late prehistoric or Roman date. The track or ditch is visible as an earthwork as late as 1951 and sections of is may survive within the now wooded Ashby Warren. It is possibly associated with a stock enclosure and/or domestic site (again visible as a cropmark) and could feasibly represent a rare survivor of the complex network of later prehistoric and Roman fields and trackways that characterises the archaeology of Lothingland (Section 5); the latter are now almost only evidenced by cropmarks. Further ground investigation of this potentially surviving boundary or track, combined with historical map research, would be greatly beneficial for understanding both the context and survival of this monument.

While the vast majority of World War Two sites recorded within the project area were completely or partially dismantled after the war, there are a few significant survivals that may be worthy of protection and designation and/or further investigation. Recent aerial photographs and modern Ordnance Survey mapping indicate that structural remains relating to one of the five Naval bases in

Lowestoft, HMS Myloden (LWT 297), still survive at the site. As discussed in Section 6.2, HMS Myloden, which undertook landing craft training for RM Commandos and Combined Operations, was located within the site of the old Silk Factory alongside Lake Lothing. Practical training was carried out at sea, with craft regularly in transit on exercise between the base, Great Yarmouth and HMS Wolverstone, another landing craft training establishment on the River Orwell. One of the main structural components of the site consisted of numerous pairings of huts, set within blast walls and arranged at angles to one another. Although of uncertain function, these may have provided accommodation for the Naval troops, but also – given the positioning and blast walls – may have contained ordnance, such as torpedoes, shells and small arms. Assessment of the most recent aerial photography and OS mapping indicates that some of the blast walls that originally surrounded the arrangements of huts and a few of the individual huts may still survive. A ground survey of the site would be beneficial to establish what level of structural remains survive intact. Given the importance of Lowestoft within the overall Naval strategies during the Second World War it could be argued that any remaining components should be regarded as a priority for heritage protection and considered for designation. The fact that the major Headquarters for the Central Depot of the RNPS 'HMS Europa' (LWT 323; located just outside the project area and known locally as Sparrow's Nest) was not recorded on the SHER prior to this project, despite having significant surviving Second World War structural remains and housing an RNPS Museum, indicates that it would benefit from further investigation and survey on the ground.

The site of a newly recorded World War Two Heavy Anti-Aircraft Battery was recorded in Oulton (OUL 019). Whilst much of the site – most notably the four large gun houses – has been removed, the central Command Post appears to survive in a modified form. Whilst an only partially surviving gun battery is probably not worthy of designation, the site should be considered for a site visit and further building recording taking place. Several areas of World War Two military training and accommodation were identified (for example SOL 030 and SOL 031), within areas of rough ground and woodland margins on the edge of the Herringfleet Marshes and the 'Duplex Drive' Amphibious Tank Training facility at Fritton Decoy (SOL 041, SOL 029 and NHER 13527), Lothingland. These areas of huts and training areas were associated with Herringfleet camp, a D-Day tank training school (Section 4.9). There is potential for there to be surviving earthwork elements and feasibly structural remains within the woodland margins

of the sites. Ground survey undertaken by Suffolk County Council (Sommers 2013), as part of the a recent European Union funded 'World War II Heritage' project (www.worldwar2heritage.com), and also earlier work by Stuart Burgess, the former Country Park Manager for the Somerleyton Estate (*ibid*.), has confirmed the survival of significant structural remains, building footings and training earthworks associated with the main tank training facility. It may be that similar remains survive at the additional peripheral sites identified on the aerial photographs in this area.

A full list of candidates recommended for further work and heritage protection measures, including designation, is provided in Appendix 1.

# 9. Conclusions

With the creation of 465 new sites (a substantial proportion of which were new discoveries), the amendment of 133 existing SHER records, and the formation of an archaeological map covering 118.25 sq km, the results of this NMP project represent a significant contribution to the SHER and to our knowledge and understanding of Suffolk's historic environment. The increase by 69% to the number of known sites within the project area represents a significant move forward in our understanding of the archaeological landscape of southern Lothingland, Greater Lowestoft and the northern portion of the SC&H AONB. In terms of the NRHE, the contribution has been even greater, with the results representing a massive 238% increase to the record as it stood at the start of the project.

In addition to highlighting a number of significant research themes, this report has provided a brief chronological overview of the entire NMP mapping results for the project area. The project revealed numerous prehistoric sites, including eleven barrow cemeteries. It identified the probable site of a previously unrecorded Roman villa at Kessingland, a post-built or aisled building (or buildings) of Roman or Anglo-Saxon date at Corton, and has added to our knowledge of the landscape of the regionally significant Roman and Anglo-Saxon site at Bloodmoor Hill, to the south of Lowestoft. It has mapped for the first time the extent and complexity of field systems throughout the project area, but particularly on Lothingland; the origins of these may lie in the prehistoric period but elements persist into the modern landscape. Medieval and post medieval sites encompass a range relating to settlement, agriculture, transport and land division, and include a number of sites which may still survive as earthworks. The project has also added greatly to our material knowledge of the Lowestoft area in World War Two, recording the physical elements of military sites visible on contemporary photographs, and identifying those that potentially survive to the present day.

In recent years, and in response to the formation and publication of the NHPP (EH 2012), NMP projects have increasingly focussed on heritage protection as one of their principal outcomes. The incorporation of the project's results into the SHER, and eventually the NRHE, will ensure better heritage protection across

the project area: those charged with the management and guardianship of the historic environment will be better informed as to the existence, location, nature and extent of archaeological sites within the project area. For the first time, this information will not be 'hidden' on a variety of aerial photographic sources, stored at a variety of locations, but readily accessible in a standardised and comprehensible format, namely SHER records and maps (accessible online via the Suffolk Heritage Explorer website, https://heritage.suffolk.gov.uk/). The fact that the southernmost of the project's three Study Areas is a designated landscape means that this increase in knowledge of the historic environment of the area will undoubtedly benefit the way in which the landscape is managed and promoted, through the work of SCCAS and the SC&H AONB. In addition, a list of sites where further work and/or heritage protection measures are recommended is given in Appendix 1. This list is not exhaustive, nor is it intended to be proscriptive, but rather it includes the sites that appeared to the Air Photo Interpretation Team to be the most significant, best preserved or with the greatest potential to benefit from additional work or heritage protection measures.

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# Appendix 1. Recommendations for Heritage Protection or Further Work

Possible candidates for designation are listed in **bold** type.

| SHER Mon UID | SHER Parish Code | Parish | Description | Condition | Comments / Recommendations |
|---|---|---|---|---|---|
| MSX27370 | ASY 002 | Somerleyton, Ashby and Herringfleet | A curving boundary ditch or hollow-way that defines the upper edge of a cropmark field system of possible late prehistoric or Roman date located within Ashby Warren. This route is possibly associated with a stock enclosure or domestic site. | The route is visible as an earthwork as late as 1951 and sections of this may survive within the now wooded Ashby Warren. | Liaison with landowner / land manager, and site visit at favourable time of year to establish extent of earthwork survival. |
| MSX27591 | BNC 001 | Benacre | Medieval to post medieval field systems and possible deserted village visible as earthworks, enclosed by the post medieval Benacre Park (BNC 020). Includes several possible trackways, and a possible area of ridge and furrow within fields. | The latest available Google Earth photography suggests that a small section of these earthworks could still survive. | Liaison with landowner / land manager, and site visit at favourable time of year to establish extent of earthwork survival. |
| **MSX27650** | **KSS 090** | **Kessingland.** | **Romano-British villa complex with possible internal structures within a large double-ditched enclosure visible as cropmarks and soilmarks. Roman tile (KSS 011, KSS 013) and many other Roman finds including a horse and rider brooch and a disc brooch (KSS Misc) from the area.** | **Cropmarks / soilmarks** | **Further systematic fieldwalking and metal detecting, geophysical survey and documentary research might further elucidate the plan, extent, date and function of the site. A management agreement with landowner would be advisable, under an agri-environment scheme or similar voluntary basis.**<br>**Designation?** |

| SHER Mon UID | SHER Parish Code | Parish | Description | Condition | Comments / Recommendations |
|---|---|---|---|---|---|
| MSX27783 | LWT 297 | Lowestoft | World War Two Naval Base, HMS Myloden, to the south of Lake Lothing | Modern OS mapping and recent Google Earth photographs suggest that some original components of the site survive within an industrial complex, in particular some of the blast walls that originally surrounded the arrangements of huts and a few of the individual huts. | Site visit and ground survey of site would be beneficial to establish what structural remains survive intact. |
| **MSX27799** | **MUD 025** | **Mutford** | **Earthwork enclosures of unknown date** | **Two conjoined rectangular and/or rectilinear ditched enclosures, with evidence of inner banks surviving in places.** | **Liaison with landowner / land manager, and site visit at favourable time of year to establish extent of earthwork survival.** |
| MSX27801 | MUD 028 | Mutford | Probable medieval platform and enclosures adjacent to Mutford Common | The most recent photography visible on Google Earth indicates that some of these earthworks, most notably the mound and the northernmost embankments, may still survive. | Liaison with landowner / land manager, and site visit at favourable time of year to establish extent of earthwork survival. |
| MSX27589 | OUL 020 | Oulton | World War Two military camp associated with a Heavy Anti-Aircraft Battery (OUL 019) | Some of the buildings appear to survive on site. | Site visit / ground survey of site would be beneficial to establish what level of structural remains survives. |
| MSX27299 | SOL 015 | Somerleyton, Ashby and Herringfleet | Undated earthworks, most probably the remains of post medieval field boundaries, tracks and roads, in Somerleyton Park. Many correspond with features depicted on the 1652 Somerleyton Estate Map. | Several of the features have been identified on the ground; however, the most complex and extensive earthworks, not previously identified, are visible in the southwestern corner of the park and were clearly visible on lidar imagery from 2009, suggesting that they too may still survive. | Liaison with landowner / land manager, and site visit at favourable time of year to establish extent of earthwork survival. |

| SHER Mon UID | SHER Parish Code | Parish | Description | Condition | Comments / Recommendations |
|---|---|---|---|---|---|
| MSX27212 | SOL 030 | Somerleyton, Ashby and Herringfleet | Area of World War Two military training activity visible as vehicle tracks, disturbed ground and small earthworks. One of three military training sites in this area (see SOL 031 and SOL 032). All probably associated with Herringfleet military camp, which was a D-day tank school, associated with SOL 029 & 041. | Unknown but potential for earthworks and structures to have survived within woodland and scrub. | Site visit; documentary and oral history research to elucidate nature and extent of site, and relationship with adjacent areas of military training activity. |
| MSX27213 | SOL 031 | Somerleyton, Ashby and Herringfleet | Area of World War Two military training activity visible as vehicle tracks, huts and other structures, and earthworks. One of three military training sites in this area (see SOL 030 and SOL 032). All probably associated with Herringfleet military camp, which was a D-day tank school, associated with SOL 029 & 041. | Unknown but while most elements appear to have been removed, there is potential for some remnants to have survived within the wooded margins of the site. | Site visit; documentary and oral history research to elucidate nature and extent of site, and relationship with adjacent areas of military training activity. |
| MSX27214 | SOL 032 | Somerleyton, Ashby and Herringfleet (also partly within Norfolk) | Area of World War Two military training activity visible as huts, structures and earthworks. One of three military training sites in this area (see SOL 030 and SOL 031). All probably associated with Herringfleet military camp, which was a D-day tank school, associated with SOL 029 & 041. | Unknown but while most elements appear to have been removed, there is potential for some remnants to have survived, particularly within that part of the site falling within Norfolk. | Site visit; documentary and oral history research to elucidate nature and extent of site, and relationship with adjacent areas of military training activity. |

| SHER Mon UID | SHER Parish Code | Parish | Description | Condition | Comments / Recommendations |
|---|---|---|---|---|---|
| MSX27293 | SOL 049 | Somerleyton, Ashby and Herringfleet | Probable rectilinear structure and possible hollow-way, likely to be of medieval and/or post medieval date. Medieval finds have been recovered from the field (HRF 009, MSF17099), and the site lies adjacent to the medieval to post medieval manorial site of Herringfleet Hall (HRF 014). | Visible as earthworks on 1940s and 1950s aerial photographs, these have since been largely or wholly levelled. Visible as a dark soilmark on later photographs. | Further systematic fieldwalking and metal detecting, geophysical survey and documentary research might further elucidate the plan, extent, date and function of the site. |
| MSX27458 | WNF 052 | Wangford with Henham | Undated linear ditches are visible as earthworks on land within the northern part of Henham Park. It is possible that these earthworks may represent part of the site described as 'Moat and earthworks of Henham village in Tuttles Wood' (HAM 005). | Only visible on one set of photographs and have therefore been recorded with a note of caution; since they may represent possible earthwork survival they could warrant further survey work, although this is difficult to be certain of since they are not visible on latest Google Earth photography as they are under an area of woodland. | Liaison with landowner / land manager, and site visit at favourable time of year to establish extent of earthwork survival. |

# Appendix 2. Methodology

## A2.1 Archaeological Scope of the Survey

All archaeological monuments, both plough-levelled and upstanding, dating from the Neolithic period to the 20th century, including industrial sites pre-dating 1945 and military remains up to the Cold War, were recorded. Those features adequately depicted by readily accessible historical maps, existing surveys or excavation plans were ignored.

Transcription was undertaken at 1:2,500 scale; any detail not clearly visible and comprehensible at a 1:2,500 output scale was omitted, *e.g.* internal features within buildings. In areas that were particularly 'busy', in terms of the number, extent and complexity of visible archaeological sites – chiefly the Lothingland and Greater Lowestoft Study Areas – strategies were devised (with the agreement of the Project Assurance Officer) to enable the mapping to be completed within a tolerable timescale. These included clarifying the level of detail at which 20th-century sites within Lowestoft would be mapped, and sketch mapping a proportion of features in Lothingland where sufficient control was provided by imported geo-referenced vertical images.

### Plough-Levelled Features

All cropmarks, parchmarks and soilmarks representing sub-surface archaeological remains were recorded.

### Earthworks

All earthwork sites visible on the aerial photographs were mapped, unless the information visible was already recorded adequately, and at a comparable scale, by existing and readily accessible earthwork surveys. Earthworks were recorded whether or not they were still extant on the latest aerial photographs. The accompanying ExeGesIS database records specify which elements of earthwork groups are surviving or plough-levelled. Significant archaeological features depicted on Ordnance Survey maps, such as moats, were included in the mapping.

## Buildings and Structures

For the most part, the mapping did not include buildings other than where these were recorded as earthworks, masonry foundations or as cropmarks or soilmarks. Standing buildings that had been destroyed were recorded where there was no other adequate record, although a map record already existed in most cases. They were transcribed and the date and cause of their destruction, where known, was recorded. Buildings relating to military or industrial sites were mapped and/or defined by an 'extent of area' where appropriate.

## Industrial Archaeology and Areas of Extraction

The survey recorded base-level evidence of industrial activity, such as salt-making, lime burning and brickmaking, where they could be recognised as pre-dating 1945 and only where the sites were not adequately recorded already by map evidence. Any evidence relating to former 'Broads' (areas of medieval peat extraction) were recorded where visible on the aerial photographs. Other areas of former extraction were only mapped where they were judged to be of archaeological significance or had a bearing on surrounding sites. Urban industrial areas were excluded from the NMP recording, unless archaeologically significant or if they contained evidence for the provision of air raid shelters for workers, for example.

## 20th-Century Military Archaeology

All former military sites and installations up to the Cold War which were visible on the aerial photographs were recorded. First and Second World War military remains, such as airfields and camps, were recorded to an appropriate level of detail, ranging from an outline defining their extent, to the recording of all structural components, depending on their significance and the amount of time available. Isolated military sites, such as pillboxes and searchlight batteries, were also mapped and recorded, again to an appropriate level of detail. Within Lowestoft, an initial assessment of the aerial photographs led to the adoption of a clarified methodology, in which the most substantial and significant were prioritised in terms of the level of detail at which they were recorded. Sites relating to military activity post-World War Two were only mapped where they related to significant activities and were characteristic of the Cold War era and strategies, *i.e.* not merely relating to general military training activities. In the event, only one Cold War site was recorded by the project: a World War Two

ARP and later Cold War Control Centre on Normanston Drive, Lowestoft (LWT 179).

### Coastal and Inter-Tidal Archaeology

None of the Study Areas included any coastal environments, all of which had been covered by the Suffolk Coast NMP (EH Project 2912). A few inter-tidal structures were recorded around the edge of Lake Lothing, comprising hulks or wrecks and a structure possibly relating to shellfish farming (LWT 240).

### Post Medieval Field Boundaries

Individual field boundaries of known or likely post medieval date were not plotted or recorded, whether visible on the aerial photographs as cropmarks, earthworks or still extant, in particular if they were depicted by OS mapping. If they were extensive, of particular archaeological significance, or could be confused with the remains of earlier field systems, their presence and extent may have been noted and in some cases mapped and recorded.

### Ridge and Furrow and Water Meadows

All remains of ridge and furrow will be recorded using a standard convention to indicate the extent and direction of the furrows. As for other sites, the distinction between earthwork and levelled ridge and furrow will be made in the record. Areas of water meadows will also be mapped to a basic level of detail, using the bank and ditch layers.

### Drainage Features

It is not within the usual scope of the NMP methodology to map drainage features. Where archaeologically significant, information can generally be derived from a detailed historical map-based search. Consequently drainage features were not recorded as part of the project.

### Parks and Gardens

Earthworks and levelled landscape features associated with historic parks and gardens were recorded, including those listed in EH's Historic Parks and Gardens Register and Suffolk County Council's Inventory of Parks (the latter are recognised as being of local or regional importance). Where appropriate other

parkland features, such as tree avenues, were mapped or, more often, a note made in the record; however this was done on a site-by-site basis and decisions were inevitably governed by the amount of time available, the relative archaeological significance of the feature, and whether it could be recorded adequately from non-aerial photographic sources. Features relating to modern or 20th-century parks and gardens were not included, although any that were of relevance to other archaeological sites may have been noted in a record.

### Transport

Major transport features, such as disused canals or main railways, were not mapped unless the evidence visible on the aerial photographs was considered to be of particular archaeological significance; in general, it was assumed that such features were already adequately recorded by other sources such as historical maps. Smaller features, such as tramways, were recorded where they were not depicted on historical maps, and/or where they were archaeologically significant, for example in relation to a nearby industrial or military site.

### Geological and Geomorphological Features

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

## A2.2. Sources

### Aerial Photographs

The principal sources of aerial photographs that were consulted by the project were as follows:

| Source | Type | Media |
|---|---|---|
| English Heritage Archive | Vertical, oblique, military oblique | Prints and digital |

| Source | Type | Media |
|---|---|---|
| English Heritage Aerial Survey | Images supplied to English Heritage by Next Perspectives through the Pan-Government Agreement (verticals, infra-red), Environment Agency lidar | Digital |
| Suffolk County Council | Oblique and vertical held by SCCAS and Suffolk Record Office | Prints and digital |
| Norfolk County Council | Oblique and vertical held by Norfolk Aerial Photographs Library | Prints |
| CUCAP | Vertical, oblique | Prints |
| Online Sources | Google Earth | Digital |

### Background Sources

The primary archival sources for the project were the SHER maps and records. However, due to time constraints and the location of the Air Photo Interpretation Team remotely from SCCAS, SHER secondary files and paper records were not consulted as a matter of course. EHA archaeological records, soils maps, maps and notes from previous NMP surveys, and digitised historical Ordnance Survey maps (usually dating to the 1880s) were also consulted routinely for each Study Area.

A selection of bibliographic sources was also used where relevant and where time allowed, in particular the journal Proceedings of the Suffolk Institute of Archaeology and the East Anglian Archaeology monograph series. However, due to the limited resources available, such additional research only took place for a limited number of sites.

## A2.3 Digital Transcription

The transcription was undertaken in AutoCAD, at a nominal scale of 1:2,500. Separate drawings were created for approximately each quarter sheet, which were then combined into a master Study Area CAD drawing. Wherever possible, archaeological features were mapped from scanned images rectified in AERIAL, with control information derived from OS MasterMap. Where necessary, the digital terrain model function in AERIAL was used to compensate for distortion due to slope and terrain; in some areas, such as suburban Lowestoft, the

landscape changes that had taken place between the photographs being taken (e.g. 1946) and the contour survey were so great that this could not be done effectively. A level of accuracy of +/- 2m should have been achieved at this scale of mapping.

Rectified images were imported into AutoCAD. Archaeological features were transcribed using a project specific set of AutoCAD layers, based upon and formatted in line with national NMP standards (Winton 2012; Helen Winton, EH, pers. comm.) and the output of other NMP projects in Suffolk, both previous and current. Additional layers (*e.g.* DITCH_DOUGHNUT and DITCH_FILL) were used to streamline the export process to MapInfo and to create 'filled' polygons where appropriate. Any deviations from the national NMP layer conventions have been changed back to the required format in readiness for submission to the NRHE. The original photographic scans and rectified images will be discarded, with the exception of complete scans of CUCAP aerial photographs which will be archived onto CD and given to CUCAP, as specified in the current NMP loan agreement.

This project also accessed several georeferenced digital photo layers, supplied by SCC and EH (images supplied to English Heritage by Next Perspectives through the Pan-Government Agreement), and on-line via Google Earth. When required, these digital layers were inserted into AutoCAD and mapping undertaken directly from the image; Google Earth images were inserted and 'aligned' onto the map base. In some instances, where the image file format would not support insertion into CAD, mapping was undertaken in MapInfo. When the available time for mapping was limited, for example in the busy cropmark landscapes of the Lothingland Study Area, rectifications were kept to a minimum where good vertical coverage showed the main components of sites. Where necessary, small amounts of additional detail were added directly to the plot by eye to ensure mapping time was kept to a minimum.

Once the mapping was complete, checks were undertaken before export of each required layer to MapInfo. Final editing of the mapping, for example to fill 'doughnuts' correctly, and formatting was then undertaken in MapInfo, with final versions of the mapping now ready for incorporation into the SHER and NRHE.

## A2.4 Database Records

### NMP Drawings

Object Data tables were created and incorporated into each AutoCAD drawing. To reduce the amount of time required, and the issue of attached data becoming outdated, this included only the SHER Parish Code (derived from blocks of numbers requested from SCCAS) and Monument UID (derived from the HBSMR database). This data was exported to MapInfo along with the mapping as attached Attribute Data. Using the data to relate the map objects to the database records would allow querying of the mapping, on the basis of period, monument type, etc. Additional, temporary, Object Data/Attribute Data tables were used as necessary but will not form part of the project archive.

### SHER (ExeGesIS HBSMR)

Each individual site ('monument') or group of sites (both new and previously recorded) was added as a new record to a local copy of the SHER HBSMR database. Information on newly recorded (or renumbered) sites was added to new blank records; information on previously recorded sites was added to a new record containing a copy of the data in the old record; no existing records were themselves modified, thus ensuring that there should be issues relating to modifications being made to two versions of the same record. Each newly recorded (or renumbered) site was allocated a new Parish Code, from a block assigned by SHER officers. All records created were assigned an automatically generated Monument UID, utilising the prefix 'MSX' to distinguish them from records held in the main 'live' database. Each record included a short written description and summary, an index of monument types and dates, evidence type, parish, and links to sources, events and other monument records. Locational data is provided by a linked Monument Polygon (or polygons) in the 'Mon' table of the SHER workspace. Sensitive sites included in Appendix 1: Recommendations for Heritage Protection. Once added to the main 'live' SHER, the NMP records will feed directly into uploads to the Heritage Gateway and Suffolk Heritage Explorer, with sensitive sites handled in the same way as the core HER data.

The project dataset is expected to be incorporated into the main 'live' HER in December 2014. A copy of the records will subsequently be supplied to the

NRHE upon request and when a suitable data transfer mechanism is in place (see Appendix D7).

### MORPH Records

In line with other NMP projects (Helen Winton, EH, pers. comm.), no MORPH recording was undertaken.

### Event Records

A parent Event Record for the whole project was created in the local copy of the SHER HBSMR database. Event Records for each Study Area and 'quarter sheet' were also created, within a linked hierarchy. Event Records provide information on the compiler, date of work, associated events and any additional information that would have previously been included on the paper Map Note Sheets. Quarter sheet Event Records were linked all associated monument records.

### Progress Sheets

No formal progress sheets were kept for each quarter sheet, but team members used a checklist of sources to ensure that all were used. A register of Parish Codes for new and amended sites was maintained and correlated against both the completed mapping and the number of records linked to each Event Record. Time spent on each individual project task, including mapping and recording, was recorded in a bespoke timesheet.

## A2.5 Reports and Publications

### NMP Archaeological Report

This internal report has been written to quantify and assess the results of the NMP for the overall project area. It summarises the main chronological trends and the character of the archaeological sites and landscapes recorded in each Study Area. The report highlights any significant sites, provides a synthesis of the results of the mapping and interpretation, and assesses its significance in the context of both the county and the region. It also aims to identify specific areas where further aerial reconnaissance and other archaeological work would be desirable, for example undated cropmarks sites of potential importance. Potential

candidates for designation or other forms of management or heritage protection are listed in Appendix 1.

## A2.6 Data Access and Copyright

The copyright for all NMP maps and accompanying records is held by English Heritage, licensed jointly to Suffolk County Council and Norfolk County Council. The provision of the NMP mapping and records to other users will be subject to a series of existing data agreements for using SHER data.

## A2.7 Storage, Data Exchange and Archiving

All photographic material loaned from EHA, CUCAP and SCC has been returned.

The primary archive, comprising maps and records, is currently stored (write-protected or with access restricted to team members) on NCC's network servers at County Hall (mapping) and a local server (HBSMR records), both of which have a daily back-up. Once fully transferred and integrated into the SHER, responsibility for storage will lie with SCC, although the Air Photo Interpretation Team will retain copies for reference purposes. After integration into the SHER, copies of the mapping and database records will be provided to the NRHE upon request and once a suitable transfer mechanism is in place.

All other project data (report files, management and administration documents, *etc*.) will be rationalised before archiving on the NCC network (where appropriate, copies to be provided to SCC and EH on request).