Historic England

Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 2)

Jack Powell and Sophie Tremlett with Sarah Horlock

Norfolk County Council

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BRECKLAND

Aerial Investigation and Mapping Survey of part of the Norfolk and Suffolk Breckland Region: Stage 2 and Overall Results

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SUMMARY
The distinctive Breckland region of East Anglia has long been notable as an area of high archaeological potential in terms of the survival of earthwork sites, in an area of the country where such remains are rare. Stage 2 of the Breckland Aerial Investigation and Mapping (AIM) survey has made a significant contribution to our knowledge and understanding of the historic environment of the area, by undertaking a new baseline survey of 94 sq of the Breckland landscape. It has created 327 new records in the Norfolk and Suffolk Historic Environment Records (HERs), the vast majority of which relate to new discoveries, while a further 206 existing records have been enhanced. Crucially, many sites have been accurately mapped for the first time, allowing them to be both better understood and better managed.

The survey has discovered, interpreted, mapped and recorded sites ranging in date from at least the Bronze Age to the 20th century. Highlights have included numerous prehistoric burial mounds (including examples not previously recorded), a wealth of medieval settlement remains, and extensive evidence of the use of Breckland for military training throughout the first half of the 20th century. Some of the sites mapped, such as the Anglo-Saxon settlement of West Stow, are of national significance. In many cases, the project's findings build upon and enhance the results of earlier projects, including the Stage 1 AIM project (Horlock and Tremlett 2018), and work by other researchers. By collating the evidence visible on the huge variety of aerial sources consulted by the project, and by making this available via the HERs in the form of digital maps and records, the information contained in the aerial sources can now be recognised, understood, disseminated and utilised by a wide range of users. It will be an important resource for those managing and making decisions about the historic environment of Breckland. The questions raised by the results, and their further analysis, will hopefully form the basis of much future research in the region.

CONTRIBUTORS
Survey, research and report by Jack Powell and Sophie Tremlett, Norfolk County Council (NCC), with Sarah Horlock (formerly NCC).

ACKNOWLEDGEMENTS
A substantial proportion of the work for Stage 1 was completed as part of 'Brecks from Above', which was a 'Breaking New Ground' Landscape Partnership Scheme Project, supported by the National Lottery Heritage Fund (formerly the HLF). The remainder of the funding for Stage 1, and all of the funding for Stage 2, was provided by Heritage Protection Commissions.

The project was undertaken and managed by NCC's Environment Team, part of Community and Environmental Services. The principal staff were Jack Powell and Sophie Tremlett, with David Gurney and subsequently Martin Horlock acting as Project Manager and Executive; Alison Yardy was Project Manager for the 'Brecks from Above' project. Heather Hamilton provided support in relation to the Norfolk Historic Environment Record (NHER). Peter Watkins helped to summarise information relating to the Palaeolithic and Mesolithic in Breckland.

The project was undertaken in partnership with Suffolk County Council Archaeological Service (SCCAS), and the authors would like to thank Dr Richard Hoggett (formerly SCCAS), James Rolfe, and Grace Campbell for their help and advice. At Historic England, advice and support was provided by Helen Winton (Project Assurance Officer and Quality Assurance Officer), Simon Crutchley (Aerial Survey), Dr Will Fletcher (formerly Inspector of Ancient Monuments for Norfolk and Suffolk) and Caroline Skinner (Senior Designation Adviser). Rachel Riley and David Robertson (Forest Research and Forestry England) were an invaluable source of help and advice throughout the project. Tim Holt-Wilson (Norfolk Geo-Diversity Partnership) kindly provided advice regarding geological and topographic features. Dr Jon Gregory (University of East Anglia), Professor Tom Williamson (University of East Anglia), Edward Martin (formerly SCCAS) and Anne Mason (Friends of Thetford Forest) all provided advice and information regarding different aspects of Breckland's archaeology and landscape history. The team would also like to acknowledge the help and support of the 'Breaking New Ground' team.

In addition to material held in the Norfolk Air Photo Library, the mapping was undertaken using aerial photographic material from a number of external collections. These included the HEA at Swindon, Historic England Aerial Survey (images supplied to Historic England through the APGB Agreement by Next Perspectives), Suffolk Record Office, SCCAS, and Forestry England. Thanks are extended to all those who kindly provided access to the photographs and supplied loans of material, in particular Luke Griffin and Fiona Matthews (HEA), Rachel Riley (Forest Research), Dr Richard Hoggett (formerly SCCAS) and James Rolfe (SCCAS); and to Simon Crutchley (Historic England) who converted the 'Breaking New Ground' lidar to a suitable format. Lidar visualisations were created using Relief Visualization Toolbox (Zakšek *et al* 2011; Kokalj and Somrak 2019)

ARCHIVE LOCATION

Suffolk County Council Archaeological Service
Bury Resource Centre
Hollow Road
Bury St Edmunds
IP32 7AY

Mapping is also available from Historic England Archive
archive@historicengland.org.uk

DATE OF SURVEY

Survey, mapping and recording for Stage 2 were carried out between September 2018 and February 2020

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Front cover: part of the medieval settlement remains mapped at Cranwich, Norfolk; base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340

Abbreviations

AIM	Aerial Investigation and Mapping (formerly NMP)
BNG	'Breaking New Ground'
CUCAP	Cambridge University Collection of Aerial Photography
EA	Environment Agency
HEA	Historic England Archive
HER	Historic Environment Record
HLF	Heritage Lottery Fund
NCA	National Character Area
NCC	Norfolk County Council
NHER	Norfolk Historic Environment Record
NHLE	National Heritage List for England
NMP	National Mapping Programme (now renamed AIM)
NRHE	National Record of the Historic Environment
SCCAS	Suffolk County Council Archaeological Service
SHER	Suffolk Historic Environment Record

INTRODUCTION

The Breckland AIM project (Historic England Project 7014; Fig 1) comprises a survey of 190sq km of Breckland, a distinctive region of East Anglia which straddles the Norfolk, Suffolk and (to a lesser extent) Cambridgeshire border. Stage 1 covered 96sq km of central Breckland, the results from which are the subject of an earlier report (Horlock and Tremlett 2018). This report collates and synthesises the results from Stage 2, which covered an additional 94sq km in two blocks located to the north and south of Stage 1. This report also draws together and assesses the results of the project overall.

AIM projects comprise large area archaeological surveys, which map and record archaeological features using aerial photographs and airborne laser scanning (lidar) as the main sources. The principal products are typically a digital map of the archaeological features, new and updated records for Historic Environment Record (HER) databases and the National Record of the Historic Environment (NRHE), a report, recommendations for heritage protection, including potential designation candidates, and suggested updates to the National Heritage List for England (NHLE).

Prior to the survey, Breckland was already known to be an area of high archaeological potential in terms of the survival of earthwork sites. This is in an area of the country where such remains are rare, due in large part to the dominance of arable farming in the region. The project addressed a key heritage risk for Breckland, by enhancing baseline knowledge of heritage assets within areas of forestry and heathland, where earthworks were known or thought likely to survive, but where vegetation cover made them difficult to identify or locate. These were also areas where ground disturbance relating to forestry practices and heathland restoration placed the survival of undiscovered or poorly recorded heritage assets at risk.

The project has contributed to the delivery of Historic England's strategic objective to protect historic places and keep them alive for current and future generations (*Corporate Plan 2019–22*). It has contributed to the identification and protection of England's most important heritage, by discovering and enhancing understanding of the hidden heritage of Breckland. This unique and fragile environment is subject to intrusive changes in land use and management, which pose a threat to its historic environment. The impact of the project has been significantly enhanced by being co-located and, in its early years, run concurrently with the HLF Landscape Partnership 'Breaking New Ground' (BNG). This ran from 2014 to 2017, and encompassed multiple projects focussed around, or with an impact upon, the historic environment. In particular, the project benefitted significantly from the availability of data from a new lidar survey, flown as part of BNG, as part of a separate project managed by Forestry England (formerly the Forestry Commission). This new survey, of

the Public Forest Estate holdings in Breckland, was undertaken with the specific aim of providing a resource from which to identify and accurately record archaeological sites surviving as extant earthworks or structures below tree cover.

As was the case with Stage 1 of the project, Stage 2 of the Breckland AIM survey has made a very significant contribution to baseline knowledge of the heritage of the Brecks. It has identified, and enhanced our understanding of, a wide variety of sites ranging in date from the Neolithic to the mid-20th century. It has identified 327 new records for the Norfolk and Suffolk HERs, representing an increase of 44 per cent within the area surveyed; it has also identified amendments for a further 206 entries. This equates to a total average density of 5.7 records per sq km, many of which encompass large groups of features, often extending for a kilometre or more, relating to 20th-century military training for example. Stage 2 of the survey has also created a digital archaeological map covering 94sq km, bringing NMP/AIM coverage in Norfolk up to 42 per cent and in Suffolk up to 23 per cent. The work has provided 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. The primary purpose of this report is to provide a summary of the Stage 2 results, highlighting significant discoveries, identifying important research themes and assessing the potential for further work. At the same time, it also incorporates a review and assessment of the results for the project overall.

Aims and Objectives of the Survey

The principal aims of the Stage 2 survey were:

- To provide significant amounts of new and enhanced baseline locational and interpretative data to the Norfolk and Suffolk HERs, that will facilitate planning, management, preservation and research decisions concerning the historic environment of the project area. *Outcome: the Stage 2 survey enhanced or created 533 HER records.*
- To contribute to the identification and protection of England's most important heritage, by discovering and enhancing understanding of the hidden heritage of Breckland. *Outcome: the project created 327 new HER records, equating to a 44 per cent increase to the HER for the Stage 2 area. It enhanced a further 206 records; combined with the new records, this equated to an average density of 5.7 sites per sq km. The results are summarised and discussed in this report, which identifies highlights, themes and areas for further work.*

- To make recommendations for sites where further protection, including designation, might be appropriate. *Outcome: a list of potential sites is included as Appendix 3.*
- To contribute to ongoing research, both academic and developer-led, into the historic environment of eastern England; the substantial contribution to ongoing research made by interpretative surveys such as the NMP (now AIM) was recognised in the previous review of the Regional Research Frameworks (Medlycott 2011), and in the current review (which is being completed http://eaareports.org.uk/algao-east/regional-research-framework-review/). *Outcome: the project's mapping, records and report will be available for future research. Already, the evidence for medieval settlement identified and recorded by the project is to be the focus of an AHRC/CHASE Collaborative Doctoral Award PhD studentship based at the University of East Anglia, to be undertaken in partnership with Norfolk County Council.*
- To provide accessible data that will inform, facilitate and encourage the study and preservation of the historic environment of the project area, and promote it as a valuable resource. *Outcome: the mapping and records will be accessible primarily via the Norfolk and Suffolk HERs (and the versions available via their 'heritage explorer' websites), and Heritage Gateway; this report will be downloadable from the Historic England website.*

The project's main objectives can be summarised as:

- The identification, mapping, interpretation and recording to AIM (formerly NMP) standards of archaeological sites within the project area. *Outcome: the project created a map of archaeological features visible on aerial sources covering the 94sq km encompassed by Stage 2. It identified, mapped, interpreted and recorded 533 individual 'sites' (defined as a single HER record).*
- The integration of this data into the NRHE, through the provision of a GIS-compatible digital map layer linked to HBSMR database records (data to be transferred once an appropriate transfer mechanism is in place). *Outcome: copies of the database records can be provided from the HERs as required. A GIS-compatible copy of the mapping, with associated data, will be submitted to Historic England for inclusion in the 'National Map' once any final changes to the report, mapping and records have been made.*
- The analysis and dissemination of the results of the project, through the production of an Historic England Research Report, and 'signposting' on Historic England websites. *Outcome: the final version of this report will be submitted for publication as part of the Historic England Research Report Series. Existing information about the project on the Historic England website will be updated.*

- Liaison with external bodies to promote the use of NMP/AIM data as a tool for informing and facilitating future management decisions. *Outcome: a copy of the mapping will be provided to local Forestry England representatives, for use within their management GIS.*
- To provide maps, records and interpretative information which can feed into the proposed Breckland warrens designation project. *Outcome: compared to Stage 1 of the project, Stage 2 recorded comparatively little evidence relating to Breckland's warrens. However, any further information that might be of use can be supplied on request.*

Project Area

The Stage 2 project area encompassed 94sq km of the Breckland landscape (Fig 1). The area was selected to cover cohesive blocks that abutted the area completed for Stage 1, but excluded the area surrounding Thetford that had been covered by the earlier Norwich-Thetford-A11 Corridor NMP project (Historic England project 5313). Two areas lying to the north and south of the Stage 1 area were chosen (Figs 2 and 4), as they had good coverage by the new lidar survey flown as part of BNG. They also covered areas of the Public Forest Estate, where earthwork survival was expected to be good, and areas of potential heathland restoration that could place undiscovered or poorly recorded heritage sites at risk. Block 3, which lay to the south of the Stage 1 area, was deliberately selected to cover King's Forest, a forestry plantation sited on and within an extensive area of former and surviving heathland. Although established from 1935 (Skipper and Williamson 1997, 28), it remained relatively open until after 1945, providing an opportunity to map from both the historical aerial photographs and lidar. The Stage 2 area also covered key known sites, including the Mount Ephraim barrow group, West Stow Anglo-Saxon settlement, part of Methwold rabbit warren, Didlington and Cranwich deserted medieval settlements, part of the First World War tank training area known as the 'Elveden Explosives Area', and the Second World War High Ash military camp, used by the 7th Armoured Division (the 'Desert Rats').

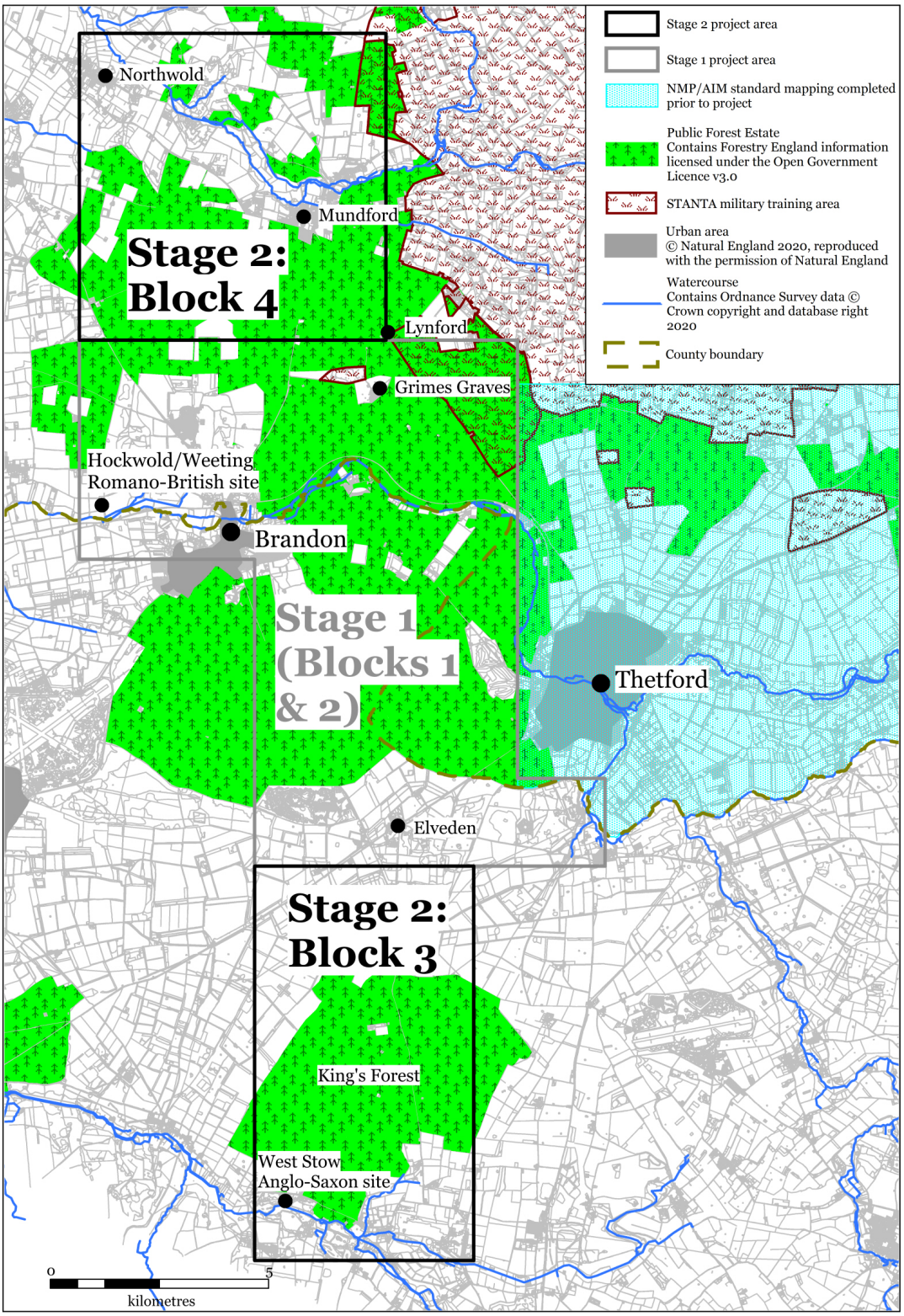

Figure 1 The project area, showing the Stage 2 mapping blocks in relation to the Stage 1 area, and key locations mentioned in the text (see *Figs 2 and 4 for greater detail). Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.*

Summary of Project Methodology

The general methodology and scope of the project was based, as far as possible, upon what was then the most recent revision of *Standards for National Mapping Programme Projects* (Winton 2015). It continued that used for Stage 1 of the project, which itself followed on from the Suffolk Coast and Heaths AONB NMP project (Historic England Project 7085). The approach was also informed by the experience gained by the Air Photo Interpretation Team of previous NMP/AIM projects in Norfolk (Historic England Projects 2913, 5241 and 5313) and Suffolk (Historic England Projects 6642 and 7085).

As for Stage 1, the project area extended across two counties, although not in this case across the county boundary itself. In practice, this had little impact upon the methodology used by the Air Photo Interpretation Team, as the processes and requirements are similar in both counties. For Stage 2, the team had remote access to the Suffolk HER, thereby avoiding the need to travel to the SCCAS offices to input and query records, as had been done for previous projects.

The project looked at all available aerial photographs, held in national and local archives, which spanned around 75 years of photography, and included vertical photographs taken for non-archaeological purposes and specialist archaeological oblique photograph collections. Online photo mosaics such as Google Earth were also reviewed. Of fundamental importance was the new BNG lidar survey data, at 0.5m resolution. Where available, Environment Agency (EA) lidar data, downloaded from the Survey Open Data website, was used where there was no coverage by the BNG survey. Again, DTM data was used and the available resolution varied between 1m and 2m (*see* Figs 7 and 8). For all the lidar data several different visualisations were consulted, created using Relief Visualisation Toolbox (Zakšek *et al* 2011; Kokalj and Somrak 2019). In general, the hillshade, multi-direction hillshade and openness visualisations, created using the default settings, were found to be most useful; the hillshades were principally useful for identifying sites, while the openness visualisations were often the easiest to map from. Additional standard sources were also used, for example, historical 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.

All archaeological sites and landscapes were analysed, with dates ranging from the Neolithic period to the Cold War. The scope of AIM projects 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 sources with linked archaeological site descriptions. The site descriptions include references to the source aerial photographs and/or lidar, to inform any re-evaluation of a site, for example for development or research purposes.

The archaeological map was created in AutoCAD, either from sources that were already geo-referenced or rectified (such as the lidar and Google Earth extracts), or from aerial photographs rectified and geo-referenced to Ordnance Survey MasterMap base mapping (usually 1:1,250 scale). Rectification was undertaken using University of Bradford AERIAL 5 software. 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 to create a GIS-compatible dataset. Polygons indicating the limits of each site were linked to associated HBSMR database records. Descriptive records with associated indexing were added directly to the relevant HER. The 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 or lidar, together with any contextual or supplementary sources used. Attribute data, comprising the Monument UID and Parish Code (Suffolk) or Pref Ref (Norfolk) was attached to each object, to ensure full linkage between the mapping and the records.

Three reports have been produced during the lifetime of the project. The first, funded by the HLF (now the National Lottery Heritage Fund), was produced at the conclusion of the 'Brecks from Above' project in March 2017. This covered the results from Mapping Block 1 and the portion (54 per cent) of Block 2, which corresponded to the 'Brecks from Above' project area. The second was the Stage 1 report (Horlock and Tremlett 2018), funded by Historic England and produced following the completion of Mapping Block 1 and the whole of Block 2 (96sq km in total). It drew upon the 'Brecks from Above' report, but was updated to incorporate the results from the remainder of Block 2, and to meet AIM standards. This report constitutes the third, again funded by Historic England. It summarises and discusses the results from Mapping Blocks 3 and 4, which make up the Stage 2 area, but also provides an overview and assessment of the results from the project area as a whole.

An important impetus for the project was the need for baseline data to facilitate better heritage protection, for example by informing responses to planning issues, or providing precise information regarding the location and extent of features at risk from habitat management and forestry. Throughout all phases of the project, the Air Photo Interpretation Team has liaised with NCC, SCCAS and Historic England to highlight any significant discoveries. Following the final submission of this report, a list of potential candidates for designation or other forms of management or heritage protection will be submitted to SCCAS, NCC, and the Historic England Listing Group (East), who will then judge what further

action to take. A list of updates to the Old County Number schedulings will also be submitted. Versions of both lists are included as appendices to this report (Appendix 3 and 4).

The project's mapping and records can be accessed through the Norfolk and Suffolk HERs; the database records are available on their respective Heritage Explorer websites (www.heritage.norfolk.gov.uk; heritage.suffolk.gov.uk) and the Heritage Gateway. Data will be supplied to the NRHE upon request, once a suitable migration mechanism is in place. In due course, it is expected that the mapping will be included in the online map being developed by Historic England's Digital Access to AI&M Data project.

The methodology of the project is described in more detail in Appendix 1.

THE CHARACTER OF THE PROJECT AREA

Breckland is an area that is unique both in terms of its environment and its landscape history. Its geology consists of chalk, overlain, predominantly along its eastern side, by till and glacial sands and gravels, and on all sides cut through by river valleys containing river terrace gravels, alluvium and peat. The region is known for its light soils, which retain few nutrients – typically a free-draining mixture of chalk, sand, silt, clay and flints – and its dryness (its climate is classified as semi-continental). The two areas covered for Stage 2 were to some extent characterised by this contrast. They both comprised areas of higher, free-draining land – often former heathland and/or warren, now dominated by forestry – bordered or cut through by river valleys – the Lark Valley in Block 3 and the Wissey Valley in Block 4. The name Breckland derives from the historic practice of cultivating areas of land or *brecks* for just a few years, before the soils became exhausted. The Breckland National Character Area (NCA) covers some 1019sq km of forestry (including Thetford Forest), heathland (much lying within the Ministry of Defence's Stanford Training Area, known as STANTA), and agricultural land. Prior to the start of the project, AIM-standard mapping had already been completed for 134sq km (13 per cent) of the Breckland NCA. This covered the historic town of Thetford and its environs, including the A11 corridor within Norfolk (Historic England Project 5313).

The importance of Breckland's Palaeolithic and Mesolithic resource, as summarised by Peter Watkins (Norfolk County Council), was outlined in the Stage 1 report (Horlock and Tremlett 2018, 8) but can be reiterated here. The region's Lower Palaeolithic sites have proven to be amongst the country's most productive, with hundreds of handaxes recovered at a number of locations. Significantly these productive sites are likely to represent both pre-Anglian and post-Anglian phases of occupation. Work at Beeches Pit, Icklingham (SHER WSW 009) has revealed what appears to be evidence for the earliest use of fire in Britain. Breckland sites have also produced important evidence for several subsequent phases of hominin occupation, the most notable being the gravel quarry at Lynford (NHER 37095) where between 2000 and 2002 a Middle Palaeolithic site of national (and arguably international) significance was excavated (Boismier *et al* 2012). Here large numbers of distinctive stone tools were found in close association with an extensive faunal assemblage, including the remains of at least 11 woolly mammoths. Scattered lithic implements demonstrate that the region saw at least an intermittent human presence during the earlier phases of the Upper Palaeolithic. There is now clear evidence for much sustained activity in the region by around 10,000 BC, with distinctive Final Upper Palaeolithic long blades assemblages recovered at a number of Breckland sites. There is also important evidence for Mesolithic activity in the area, for example at Two Mile Bottom, Thetford (NHER 5719, 5738), and West Stow (SHER WSW 002), as well as numerous findings of stray artefacts and flint

scatters. As with the evidence for later prehistoric activity, the quantity and distribution of Upper Palaeolithic and Mesolithic artefacts recovered in Breckland reflects not just the intensity of past activity but the extent to which its open heaths and warrens have facilitated the collection of lithic assemblages.

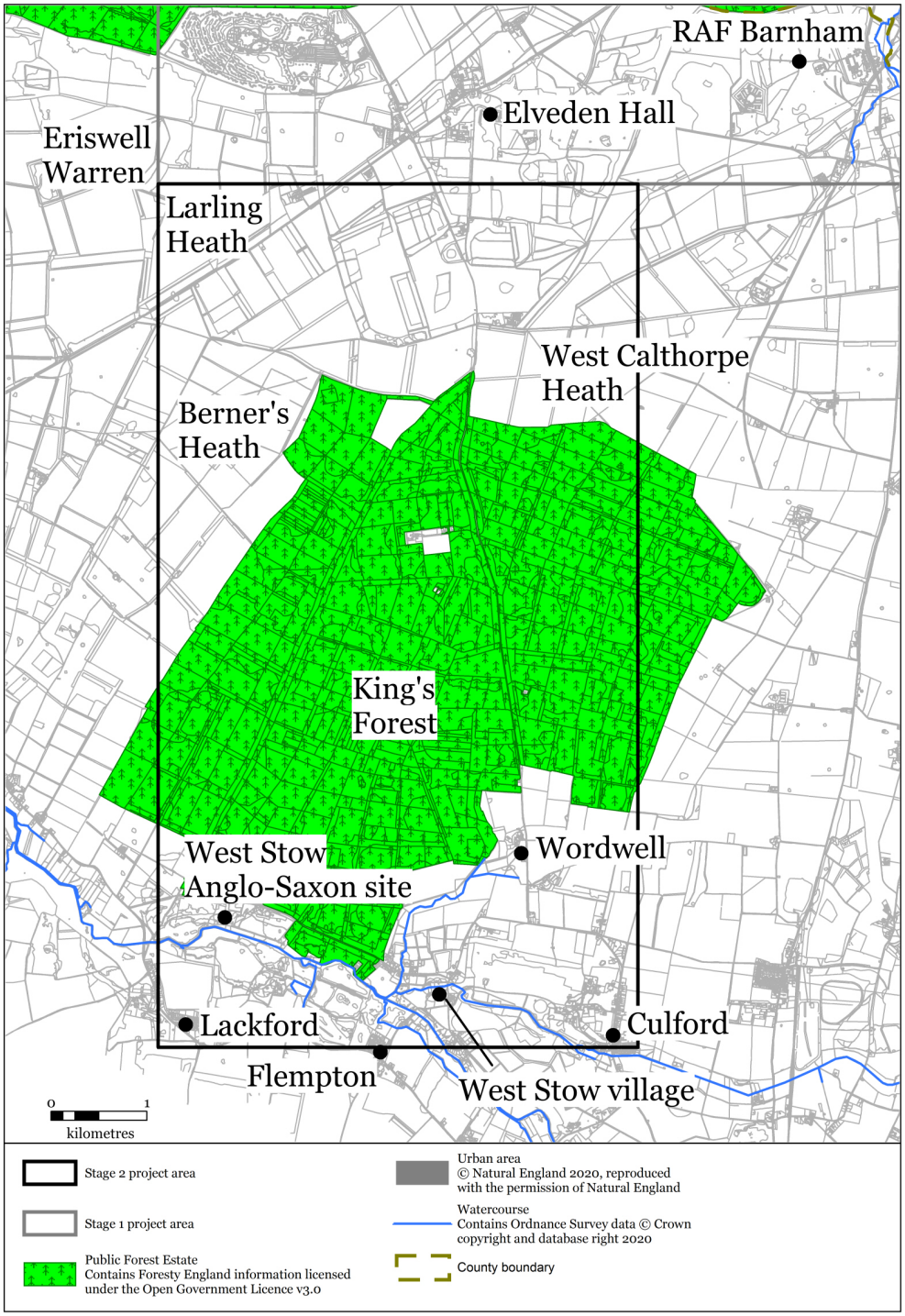

Figure 2 Block 3, with key locations mentioned in the text. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Again as described in the Stage 1 report (Horlock and Tremlett 2018), the Breckland region is notable for its earthwork sites, which are relatively numerous and well preserved in comparison to other parts of East Anglia. This is due in large measure to the great tracts of heathland that once existed here, which to some extent still survive, and to the requisitioning of the STANTA training area by the Ministry of Defence in 1940, affording a substantial level of protection to archaeological sites within its bounds. The light soils of the region make Breckland's earthwork sites especially vulnerable to ground disturbance. At the same time, the forestry plantations and heathland vegetation that have to some extent protected them, also limit their visibility and the ability to locate them accurately, making them hard to find and to manage, and thus more vulnerable to land management changes.

Figure 3 The initials 'G R' visible within forestry plantations in King's Forest in 1951. The photograph has been orientated so that north is at the bottom of the image. Photograph RAF/58/649 RP 3125 23-APR-1951 Historic England Archive (RAF Photography; detail).

The main area of forestry within Block 3 was King's Forest, one of the last parts of Thetford Forest to be established. It began to be established from 1935, on land acquired the previous year as part of the Culford Estate (Skipper and Williamson 1997, 23; 28). It was named in commemoration of the Silver Jubilee of George V, and the initials 'G R' were formed in the new plantations, north of

what is now marked as Weststow Long Plantation (Fig 3). This effect was apparently achieved by mixing beech trees into the pine plantations (Malone 2005, 25), but on the 1940s and 1950s aerial photographs, the initials appear largely free of tree cover. A beech avenue – Queen Mary's Avenue – was established and a monument erected further to the north; unlike the initials, these are both still extant. The late date for the establishment of King's Forest meant that many areas were still relatively free of woodland cover in 1945, providing an opportunity to use historical aerial photographs as well as lidar to identify earthworks on the former heathland. This was in contrast to most other areas covered by the survey, where the forestry plantations visible today were already well-established by the 1940s.

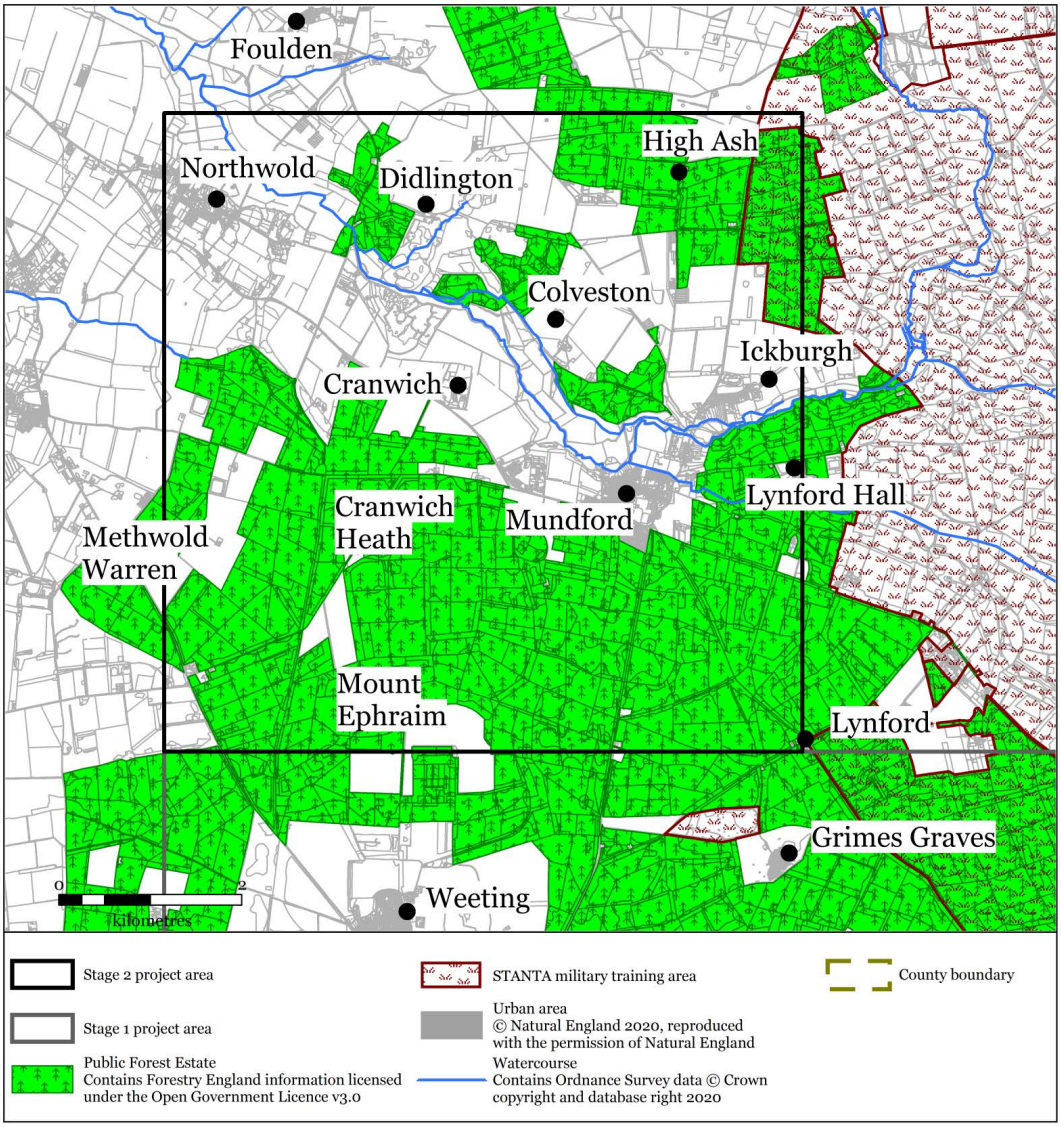

Figure 4 Block 4, with key locations mentioned in the text. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Block 4 (Fig 4) was characterised by the most varied landscape encountered by the survey. Although dominated by forest cover across its southern portion, a more open and mixed landscape of fields, villages, woodland, plantation and river valley characterised its northern half (Fig 5). Archaeological sites recorded prior to the survey included Didlington Park and deserted medieval village (NHER 40234 and 11758), Cranwich deserted medieval village (NHER 1039), part of Methwold Warren (NHER 55577) and High Ash Second World War training camp (NHER 34704). The area contained extensive tracts of former heathland, but unlike Block 3, and as for much of the project area, most this was already under forest cover by 1945. The north-east corner of the block fell within the military training area known as STANTA, established in the 1940s and still in use today. The western edge of the block encompasses parts of the parishes of Feltwell, Methwold and Northwold, along the Norfolk fen edge, an area notable for its prehistoric and Roman period sites.

*Figure 5 The varied landscape of Block 4, looking west-northwest across Lynford Hall Park (NHER 30470). The flooded gravel pits (*top right*) were the location of the Lynford Middle Palaeolithic site (NHER 37095). Photograph NMR 29189_026 28-OCT-2014 © Historic England.*

With the award of Growth Point status to Thetford in 2006, and the dualling and diversion of the A11 around Elveden, the heritage assets of the area are at risk from related development. This is most likely to take place in surrounding towns and villages, but there are also risks from diversification in the use of agricultural land (solar farms, for example). Within the forestry and heathland

areas that characterise much of the Stage 2 area, threats from changes in forest management and heathland restoration (which often includes ground disturbance) were the principal focus of the project. Fifty per cent (47.2sq km) of the Stage 2 area is within the Public Forest Estate. It also contained several areas that were potential targets for heathland restoration. The latter is a particular issue in the Brecks: the region's unique geology, soils, environment and landscape history have produced landscapes that are an important target for conservation and regeneration of the natural environment, but its light soils mean that archaeological sites are especially vulnerable to disturbance. This is particularly a problem where their existence has not been recognised or they are inadequately recorded.

FACTORS AFFECTING THE RESULTS OF THE SURVEY

As is the case with any archaeological survey, the results of the Breckland AIM project have been influenced by a number of different factors. Some of these factors are inherent in the methodology used for AIM projects, or in the nature of aerial photographic (or lidar) 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.

Methodology

The comprehensive analytical and interpretative aerial photographic survey provided by the methodology used by AIM projects 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 – and lidar – to map and record any visible new and previously known sites, irrespective of their present-day survival and encompassing every period, usually spanning the period from the Neolithic to the Cold War (for a national overview *see* Evans 2019). While some aerial photographic transcription of specific sites had been undertaken prior to the start of the project, for the most part such work had not made use of the full range of sources typically consulted for projects using AIM standards. This means that new sites, and new information about previously recorded sites, were recorded even in parts of the project area that had already been subject to archaeological investigation. In addition, for most of the project area, the survey was the first time that much of the historical, non-specialist aerial 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 reappraised.

Perhaps more significantly, the survey represented the first time that high resolution lidar data had been available, and utilised systematically, for much of the project area. Given the difficulty of using aerial photographs and conventional ground-based survey techniques in wooded environments, the project provided an important opportunity to discover new earthwork features within the extensive forestry plantations that characterise so much of Breckland, and to produce a coherent and accurate map of those features (or fragments of features) that had been recorded previously.

The project encountered relatively few methodological issues during its lifetime. Most frequent were difficulties in producing accurate rectifications of aerial

photographs. This was often the case in heathland areas, where there were few control points available, areas where gravel extraction had taken place removing control points seen on the historical aerial photographs, or in forestry plantations, where control points were more plentiful but often 'soft', comprising the corners of plantations or the junctions of rides. Within Block 4, however, the problem was more widespread, and this perhaps reflects inaccuracies in the Ordnance Survey mapping of a particularly remote and undeveloped area of Norfolk.

A second issue related to the extensive nature of many of the sites encountered by the project, in both Stages 1 and 2. These were often rabbit warrens, military training areas, or long-distance boundaries or routes. In several instances, they fell within more than one mapping block or project stage, or were only partially within the project area. For the latter, while it is normal for AIM projects to map 'whole' sites, even where they lie partially outside a project area, in the case of the very extensive sites encountered in Breckland – which could extend for several kilometres – this was not feasible. In part, some issues could have been avoided by better, more detailed project planning, that took existing site boundaries into account to a greater extent when defining the project area. However, in many instances, the AIM survey was the first time that the true extent of the site was recorded in the HERs, so could not be planned for using the usual methods. Additionally, in a landscape of extensive sites, where resources allow only part of the area to be surveyed, a line has to be drawn somewhere, and this means that there will always be sites that can only be partially covered. However, the issue does create interpretation and recording difficulties; it may entail the same site being mapped and recorded by several different people, for example, or in a piecemeal fashion over a long timescale. It would be worth taking into consideration when planning any further surveys of this type in Breckland.

Further details of the project methodology are given Appendix 1.

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, and to a lesser extent lidar, to record the historic environment. This is especially the case in arable areas, where sites predominantly consist of sub-surface remains. The complex and varied processes and conditions which lead to differential crop growth are described in detail elsewhere (for example Wilson 2000, 67–86). However, the entire Breckland AIM project area was unusual for the eastern counties, due to the high incidence of earthwork remains – which are generally scarce in a region dominated by arable agriculture – and the extensive areas of land covered by forestry plantation (50 per cent of the Stage 2 project area, 55 per cent of the

project area overall). This has meant that topography, land use and coverage by the aerial sources – whether aerial photographs or lidar – has had a far clearer impact on the results of the project than geology or soils. These factors are discussed in further detail below.

As for Stage 1, there were many instances where it was difficult to distinguish archaeological features from those relating to geo-morphology. The Brecks have long been noted as an area where the physical traces of earlier, pre-Holocene landscapes are clearly evident. Features such as 'patterned ground' – where periglacial freezing and thawing has caused the underlying chalk to be pushed up through a shallow covering of sand – were extremely common, both as cropmarks and as low earthworks. Where there was some uncertainty as to the archaeological nature of some of the mapped features, this was noted in the relevant HER record. However, it is possible that some features of natural origin have been recorded as archaeology, and also that some archaeological features have been misinterpreted as features of natural origin and excluded from the record. Such uncertainties are not uncommon in interpretative surveys using aerial sources, but they have perhaps been more prevalent in Breckland, where the landscape bears so many traces of its geological past.

Topography and Land Use

The topography of an area and its land use (which are closely 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, industry, 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 difficult or impossible to detect using conventional aerial photography, while ploughing may make sites visible as cropmarks or soilmarks, under the right conditions.

As with all surveys utilising aerial sources, these processes are likely to have affected the results of the project, but in Breckland they appear to be of particular significance. Topographically, both the areas covered by Stage 2 consist of higher ground, bordered by a river valley. The southern block, Block 3, is bordered by the Lark Valley, which cuts roughly east to west across its southern end. Also, its north-east corner is formed by the upper valley sides of a tributary of the Little Ouse (the latter bisected the Stage 1 area). Block 4, to the north, covers the north side of an interfluve of higher ground between the valleys of the Little Ouse and Wissey rivers; the corresponding south side of this interfluve was covered by Stage 1 of the project. To the north, this interfluve is

bordered by the relatively broad Wissey Valley, which widens towards the north-west corner of the block where the landscape can be characterised as being as much part of the fen-edge as the Brecks. These varied landscapes present two different landscape histories and two contrasting areas in terms of modern land use. The higher ground is dominated by former heathland, some of it formerly used for rabbit warrens, large tracts of which are now occupied by forestry plantations. Here archaeological sites were mainly visible as earthworks, with numerous barrows, probably (mainly) post-medieval boundaries, and features relating to 20th-century military training. In the valleys, the landscape is more open, with areas of arable and several villages. Here earthworks were mainly – but not exclusively – recorded from historical aerial photographs, and a there was a greater number of cropmark sites. While this variation in survival and visibility has significant implications for the results of the project, and their interpretation, it is notable that the contrast is not as that great as that encountered during Stage 1 of the project (Horlock and Tremlett 2018, 12–13).

*Figure 6 An area of King's Forest visible in 1945 (*left*) and 2018 (*right*). Photographs RAF/3G/TUD/UK/60 V 5134 05-FEB-1946 Historic England Archive (RAF Photography; detail) and EARTH.GOOGLE.COM 03-JUL-2018 ACCESSED 14-FEB-2020 © Google.*

Within Block 3, the main area of forestry is King's Forest. This was established from 1935, and was one of the last parts of Thetford Forest to be planted. Most other areas of forestry within the project area were already well-established by the 1940s, thereby limiting the usefulness of aerial photographs to the survey, other than those taken fortuitously following clear felling. In contrast, large parts of King's Forest were still relatively open in the mid-1940s (Fig 6), thus offering an opportunity to use historical aerial photographs as well as lidar to identify earthworks on the former heathland. The historical aerial photographs

were particularly useful for mapping elements of the First World War tank training area and Second World War bombing range at Berner's heath, which does not presently have full lidar coverage, and the eastern side of which is now under plantation woodland.

Aerial Reconnaissance, Photo and Lidar Coverage, and Previous Archaeological Work

The date, distribution and density of aerial photographs and lidar sources has a significant impact upon the results of any project utilising aerial sources. The project consulted several photographic collections in order to ensure the best possible photographic coverage, but this was not equal across the project area. It was also not always certain that all available coverage had been viewed: some of the SCCAS collection is unaccessioned, there was no locational information for many of the Forestry England photographs, and the library of the Cambridge University Collection of Aerial Photography (CUCAP) is closed, making it impossible to view any photographs not held as copies elsewhere. Some material held by the HEA is not available to loan, so printouts of laser scans were consulted, rather than the original prints.

The CUCAP library was closed for the duration of the project, meaning that only copies of CUCAP photographs held in other collections could be consulted. Across Blocks 3 and 4, a total of 229 CUCAP prints were assessed, copies of which were held by the Norfolk Air Photo Library, the HEA, by SCCAS or Forestry England. This constituted 28 per cent of the 813 prints listed in the coversearch (derived from CUCAP's online catalogue https://www.cambridgeairphotos.com/, excluding duplicate entries), which included a 1km buffer around each block. A higher proportion of prints – 35 per cent compared to 23 per cent - were consulted for Block 4 than Block 3. There is, of course, potential for additional sites which were not recorded by the project to be visible on these unconsulted photographs. As most of the inaccessible material, however, is recorded as being of non-archaeological subjects, it likely that any missed sites are relatively small in number and limited in extent.

The varying lidar coverage across the Stage 2 mapping blocks is shown in Figures 7 and 8. The 2015 BNG lidar survey, flown as part of the Landscape Partnership project, was the single most important source for those parts of the Stage 2 area under forestry plantation. This was particularly the case for the forested areas of Block 4, where plantations were already well established by the 1940s, and even historical aerial photographs were of very limited use. The BNG lidar was processed for use at 0.5m resolution. It covered 61 per cent of the Stage 2 area, concentrated on those parts that form part of the Public Forest Estate.

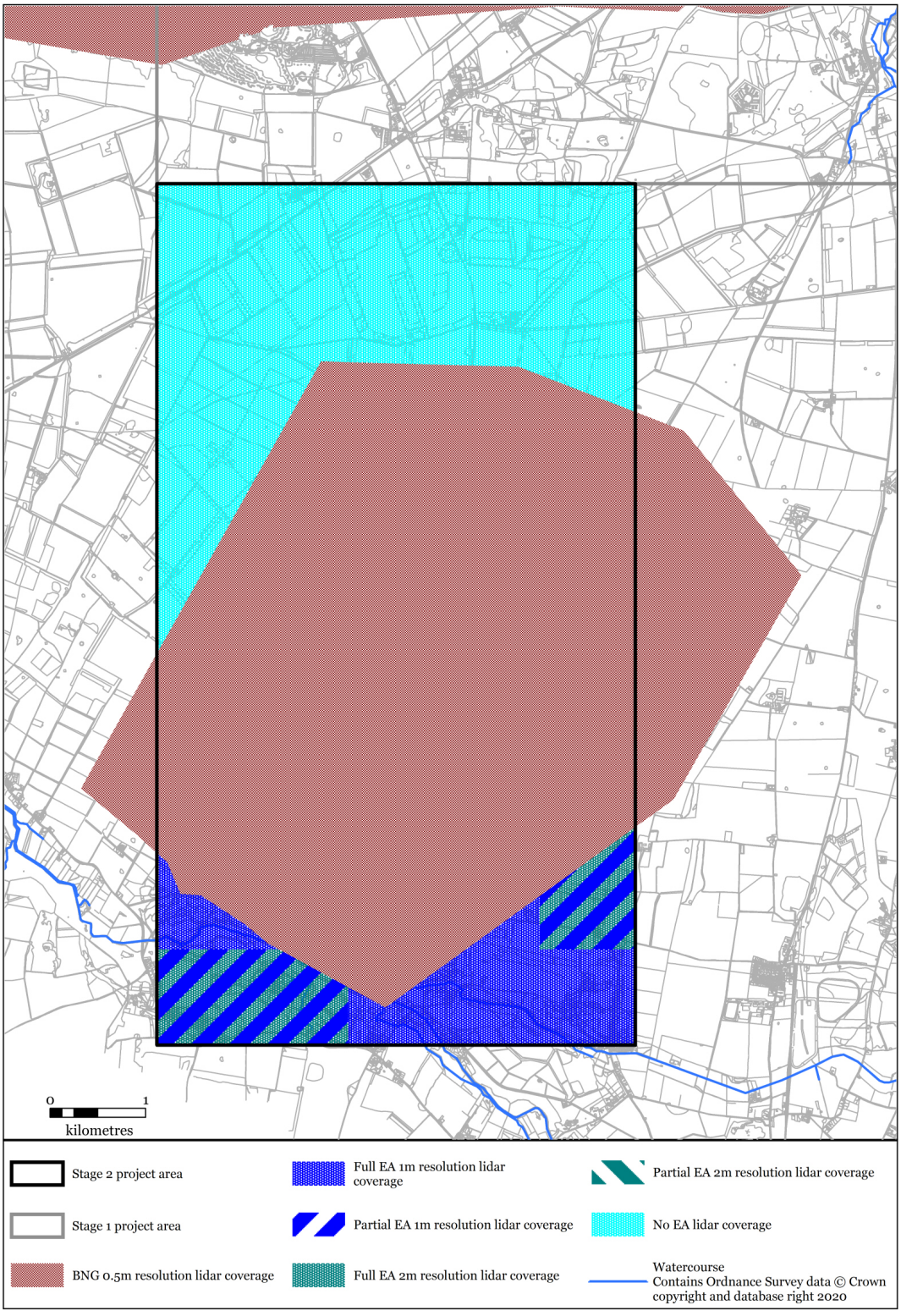

Figure 7 Lidar coverage within Block 3, showing the best available resolution; BNG lidar is mapped by extent, EA lidar by 1km tile. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Outside the forested areas – along the Lark Valley and in the more arable areas around Elveden and along the Wissey – it was necessary to use EA lidar data instead. The latter was available at 1m resolution for some areas (either whole or partial 1km tiles), while only 2m resolution data was available for others. One metre resolution is usually regarded as the minimum for effective investigation of archaeological remains, but the previous experience of the project team is that the 2m resolution data can also be useful, when no better resolution data is available. For some areas, for example the northernmost portion of Block 3 – around Larling, Berner's and West Calthorpe heaths – no lidar data of any kind was available.

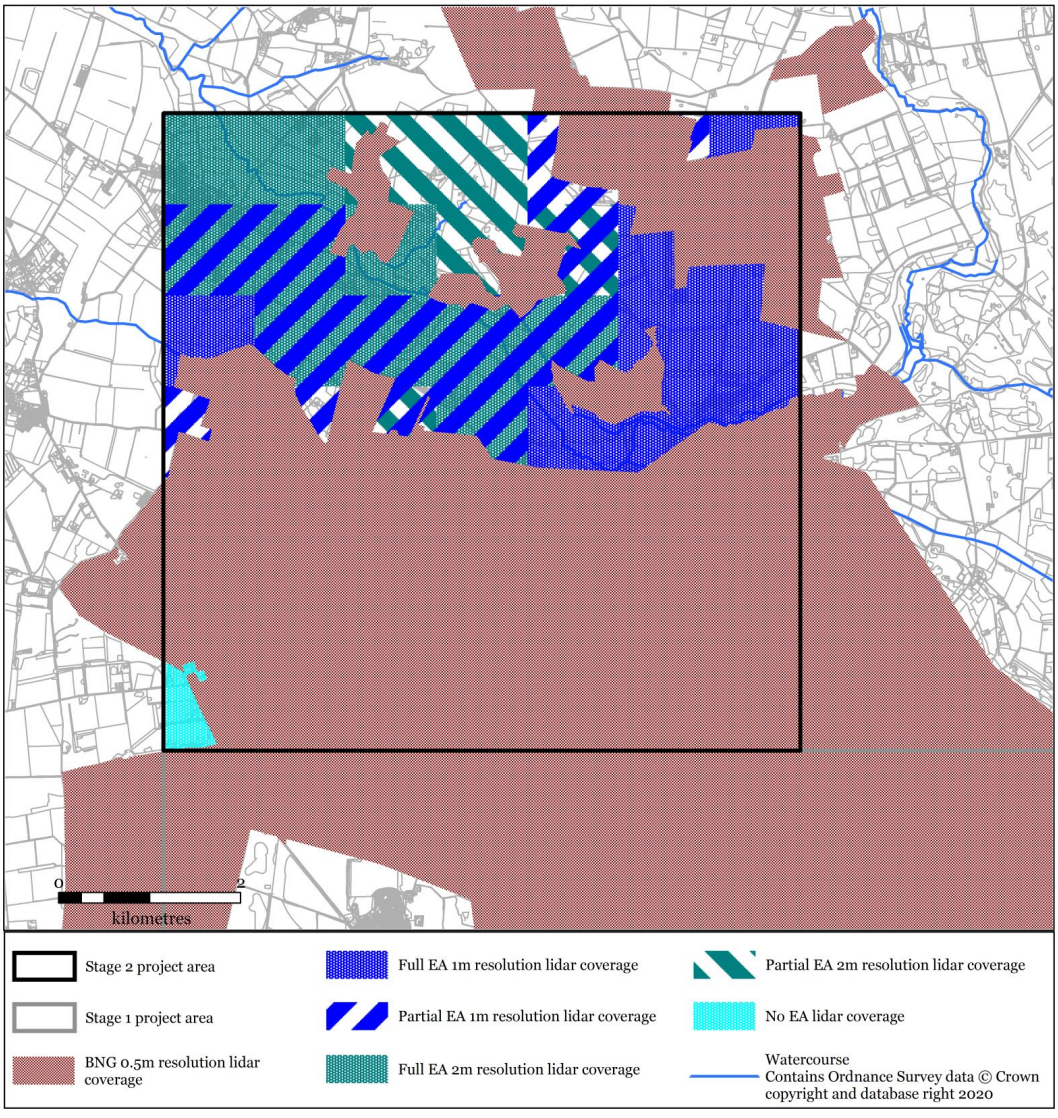

Figure 8 Lidar coverage within Block 4, showing the best available resolution; BNG lidar is mapped by extent, EA lidar by 1km tile. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Most of the photographs consulted were vertical photographs, and included, amongst others, surveys by the RAF and OS, and online sources of photographs (Google Earth and Bing Maps). 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. Photographs taken in the 1940s were crucial for the identification of 20th-century military features and sites, although it was not always possible to deduce what precise period these might date to – First or Second World War, inter-War or pre-First World War territorial manoeuvres. The very limited availability of material pre-dating 1945 was a significant problem in this respect. Lidar was also useful for those 20th-century military sites where earthworks had been preserved within plantations, although again precise dating was often difficult. In more arable areas, the historical aerial photographs were crucial for recording earthworks, particularly relating to medieval settlement, that had since been levelled. The number, density and character of settlement remains encountered by the project has been quite remarkable when compared to results from other areas in Norfolk and Suffolk where the team has worked.

The two areas covered by Stage 2 had seen a considerable amount of previous archaeological investigation and recording, although little in terms of air photo or lidar interpretation. Substantial areas of forestry plantation had been investigated on the ground, through Rapid Earthwork Identification Surveys or similar. Often these surveys identified parts of much larger earthwork features, which the project has now been able to map more fully. Unsurprisingly, given the difficulties of locating sites on the ground in areas of woodland – especially before the widespread availability of GPS – existing records were often inaccurate. More detailed surveys, and in some cases excavations, had been carried out at a number of sites. In Block 3, the Anglo-Saxon settlement at West Stow has seen a considerable amount of investigation. However, the limited information visible on the aerial sources did not allow a significant amount of correlation to be done, as had been attempted for some sites covered by Stage 1 (Chequer/Staunch Meadow at Brandon, for example: Horlock and Tremlett 2018, 31). In Block 4, Lynford Park was perhaps the most concentrated area of features identified by Rapid Earthwork Identification Survey.

SUMMARY OF ARCHAEOLOGICAL RESULTS (STAGE 2)

Overall Results

Stage 2 of the project identified 327 new records for the Norfolk and Suffolk HERs, and amendments for a further 206 entries; in total, the records relating to 533 individual 'sites' were created or enhanced. Although the 'new' records include a small proportion (8, or 2 per cent) of previously recorded sites that were split into separate elements and renumbered, or included in the recording for a more extensive new site, this still represents a very significant number of archaeological sites and landscapes recorded for the first time. Prior to the project starting the HERs had mapped 747 sites within the project area (grouped by Monument UID rather than Pref Ref/Parish Number). The Stage 2 results therefore represent a 44 per cent increase to this record.

The figures are presented in Table 1, with the Stage 1 and overall figures for comparison.

Table 1 Quantification of project results

Mapping block	*Area (sq km)*	*Existing HER records (mapped)*	*Total 'sites' recorded by project*	*Records created by project*	*Records amended by project*	*Increase to HERs*	*Density of sites recorded by project*
Block 1	50	569	404	251	153	44%	8.1
Block 2	46	263	371	219	152	83%	8.1
Stage 1 overall	96	825	775	470	305	57%	8.1
Block 3	**45**	**367**	**231**	**139**	**92**	**38%**	**5.1**
Block 4	**49**	**380**	**302**	**188**	**114**	**49%**	**6.2**
Stage 2 overall	**94**	**747**	**533**	**327**	**206**	**44%**	**5.7**
Project total	190	1572	1308	797	511	51%	6.9

For sites recorded within the NRHE the increase is even more striking. At the start of the project, the Stage 2 area contained 162 NRHE monument records. Forty-two records created or amended by the project correlate with one or more of the HEA records. Across the Stage 2 area, therefore, a total of 491 new NRHE sites have been recorded, equivalent to a 303 per cent increase in the number of records for the area.

Unless otherwise stated, the sites referred to in the text relate to parish codes in the Suffolk HER (prefixed SHER, eg SHER STN 122), or HER numbers ('Pref Ref's) in the Norfolk HER (prefixed NHER, eg NHER 5640).

Geological Features

The geology of Breckland is of considerable interest. It is particularly noteworthy for the many traces of the last glaciation still evident in its landscape; this includes the 'patterned ground' – a result of periglacial conditions – for which, from an aerial archaeology perspective, the area has long been known (Fig 9).

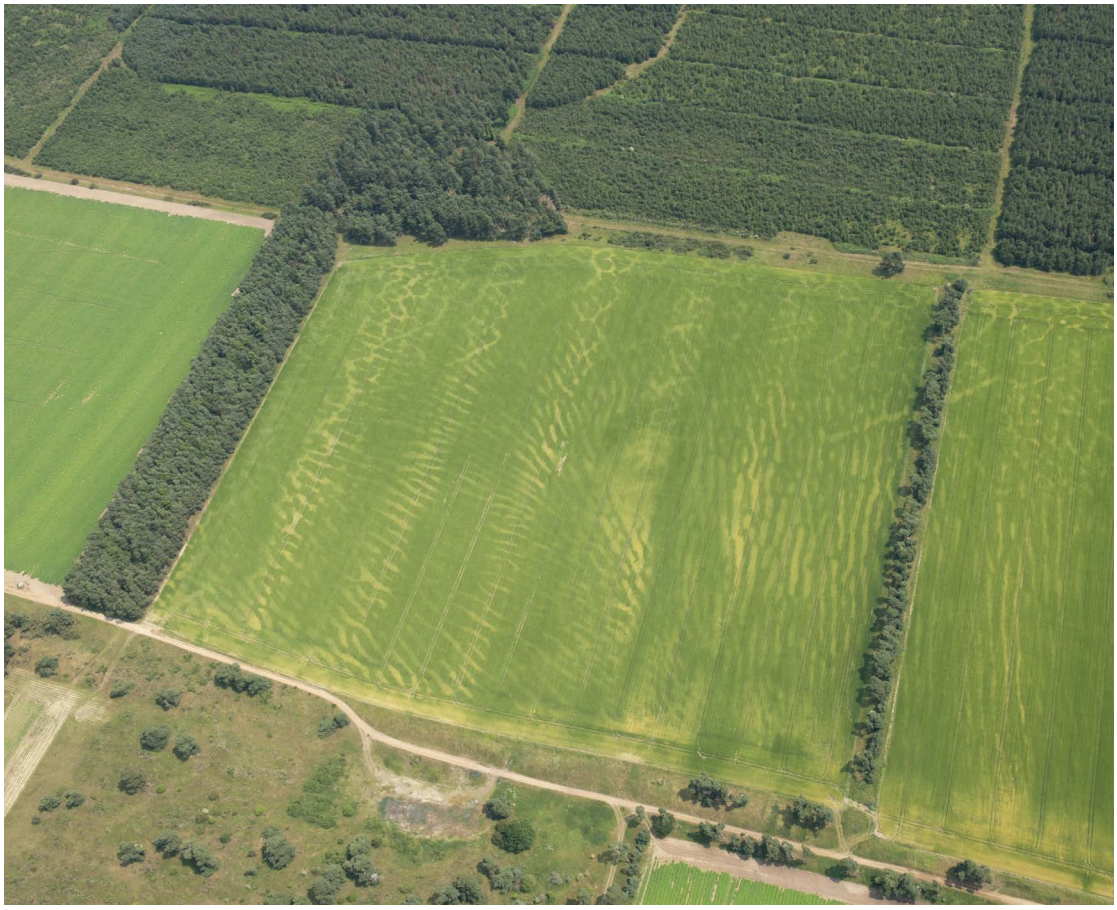

Figure 9 Cropmarks of 'patterned ground' at Icklingham, just outside the western edge of Block 3. Photograph NMR 27773_018 05-JUL-2013 © Historic England (detail).

In common with other AIM/NMP projects, the identification and recording of geological or, more broadly, geomorphological features was not within the scope of the survey. In general, geomorphological features were not plotted unless their presence helped to define the limits of an archaeological site or feature, or, more commonly, there was uncertainty as to the archaeological or non-archaeological origin of the feature. Geological and geomorphological features may have been noted in site records, as their presence in some instances could assist with the interpretation of a site or landscape.

As was evident during both Stage 1 and Stage 2 of the project, however, in appraising the aerial sources for the area, it is clear that there is potential to record such features more comprehensively. The lidar was particularly useful in showing landforms, such as dry valleys, possible dunes, periglacial mounds and areas of possible scouring. 'Patterned ground' was clearest on the aerial photographs, but was also evident on the lidar as faint earthworks at some sites. Some work using the lidar has taken place (for example Holt-Wilson 2017, 4), but there is clearly potential for a more intensive survey, using a wider range of sources.

Palaeolithic and Mesolithic

As has already been described, Breckland has long been notable for its extensive evidence for both the Palaeolithic and Mesolithic periods. However, as has been found by other surveys using a similar methodology, sites of this date are for the most part not visible on the aerial sources. Even if traces are evident, they may not be recognised as being of this date. As a consequence, no sites or features were identified which were thought to date to any earlier than the Neolithic.

Mapping of geomorphological features, as described above, could help to identify potential locations for sites of this date. As also described above, such mapping is outside the scope of AIM projects, where the intention is to create an archaeological dataset, but the presence of geomorphological features is taken into account during the analysis.

Neolithic

Breckland is home to one of the region's most important Neolithic sites, the flint mine complex at Grimes Graves. This site was covered by Stage 1 of the project (Horlock and Tremlett 2018, 16–17). As was the case for Stage 1, other sites with even a tentative Neolithic date have been rare throughout the project. This is perhaps due in large part to the difficulty of recognising sites of this period, in the absence of distinctive cropmarks or earthworks. It is possible that some Neolithic features have been recorded, but assigned to a later period or given just a general prehistoric date.

Within Block 4, on what was probably formerly part of Cranwich Heath, there were a number of previously recorded sites where evidence of Neolithic flint mining had been reported (NHER 4998 and 4999, for example). The reports of such sites were generally historical in date, and difficult to verify. At those that had been visited, any related earthworks were felt to be more probably the product of relatively recent mineral extraction – for sand, gravel or marl – rather than anything more ancient. The evidence from the aerial sources (and

historical map evidence) tended to confirm this, with several pits of probable post-medieval to modern date being evident on the lidar. One group of more muted earthwork pits (NHER 61154), however, is perhaps slightly more convincing as a group of prehistoric flint mines (Fig 10). Significant quantities of Neolithic worked flints have been recovered from the vicinity (NHER 11233 and 11232, for example). It is also notable that recent colour vertical aerial photographs show a number of rather irregular sub-circular vegetation marks in the area surrounding the pits. These were not mapped by the project, as it was felt that they were more likely to relate to modern forestry, land management and/or heathland restoration. However, they share some similarities with vegetation marks recorded during Stage 1 of the project, in the vicinity of Grimes Graves (Horlock and Tremlett 2018, 17–19, figs 2–3). Further investigation of this site, perhaps using geophysics, could be beneficial.

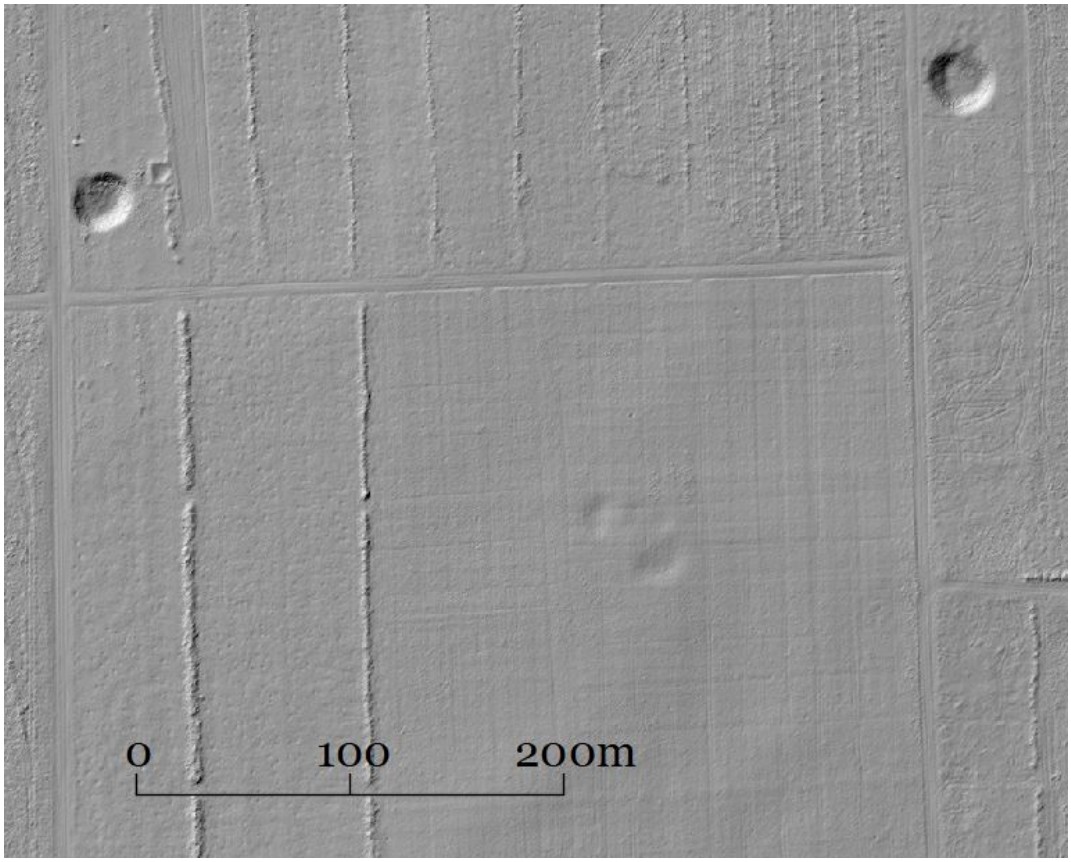

Figure 10 Visualised lidar imagery showing pits of possible Neolithic date (NHER 61154, centre*). Two further pits, probably the product of post-medieval to modern extraction, are visible to the north as much clearer and more substantial earthworks. Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England.*

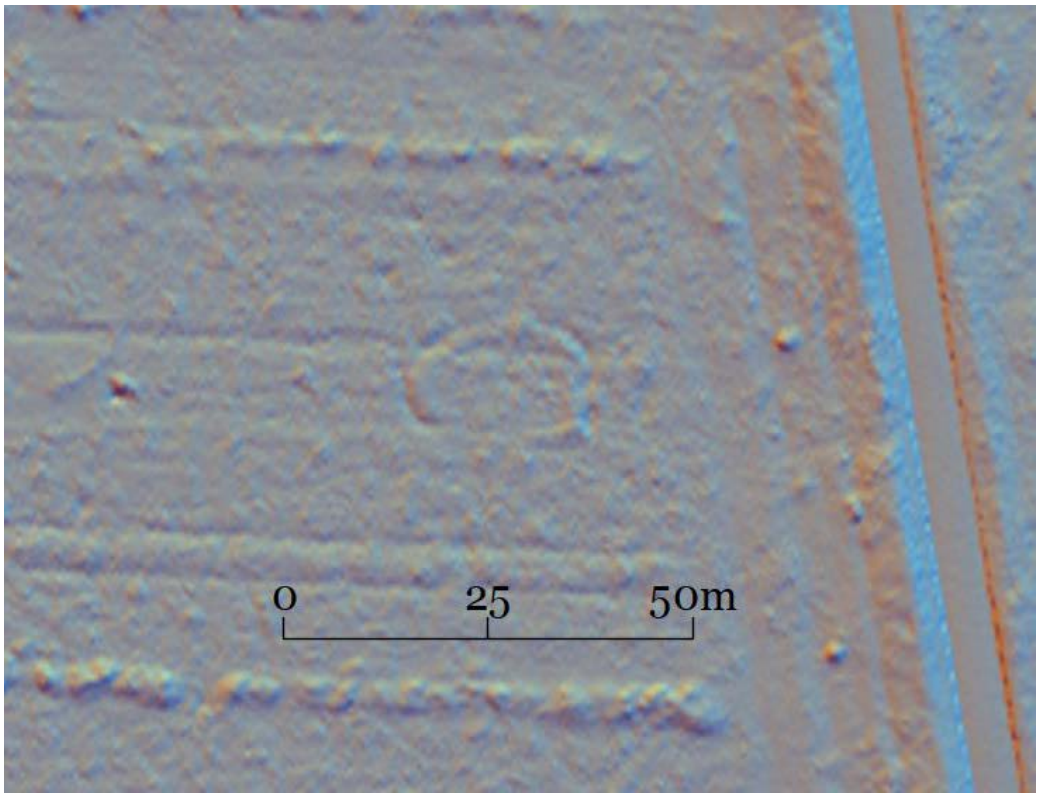

Figure 11 The oval enclosure at Wordwell for which a possible Neolithic date has been tentatively suggested. It could instead be the product of 20th-century military training activity or modern forestry. Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England.

In Block 3, at Wordwell, a curved earthwork bank with a thin exterior ditch, possibly forming an enclosure (SHER WRW 087), is visible as an earthwork on visualised BNG lidar data (Fig 11). The date and function of the possible enclosure are unknown. The form of the enclosure is reminiscent of a Neolithic mortuary enclosure. However, it could equally relate to a 20th-century military training feature or a modern forestry feature.

Also in Block 3, two small mounds or banks and a large, roughly oval shaped mound (SHER IKL 367) have been recorded from historical aerial photographs. It is possible from the form of the large mound, to suggest that the feature may be a Neolithic barrow; however, the features may instead relate to sections of a former post-medieval boundary bank. The large mound is depicted on the 1st Edition 6 inch Ordnance Survey map and can be seen as an earthwork in the 1940s. It is presumed to have been levelled by the 1970s, but can possibly be seen as a soilmark on recent (2008 and 2014) aerial photographs.

In addition to the sites already described, there were a number of ring ditches and enclosures for which a Neolithic date was thought to be possible but not necessarily likely. These are included in the discussion of Bronze Age sites below.

Bronze Age

As was the case for Stage 1, the record of Bronze Age sites created by Stage 2 of the project was dominated by funerary sites. Across both blocks, a total of 69 sites associated with known, probable or possible round barrows (or related monuments) were mapped. This represents 7 per cent of all the sites mapped by Stage 2 of the project. They included sites of ring ditches thought to be associated with former barrows, and records for barrow cemeteries. The sites were fairly evenly distributed across the two mapping blocks, with thirty-eight recorded in Block 4, compared to thirty-one in Block 3. They included both previously recorded barrows and ring ditches – which existed in some numbers prior to the survey taking place – and new examples.

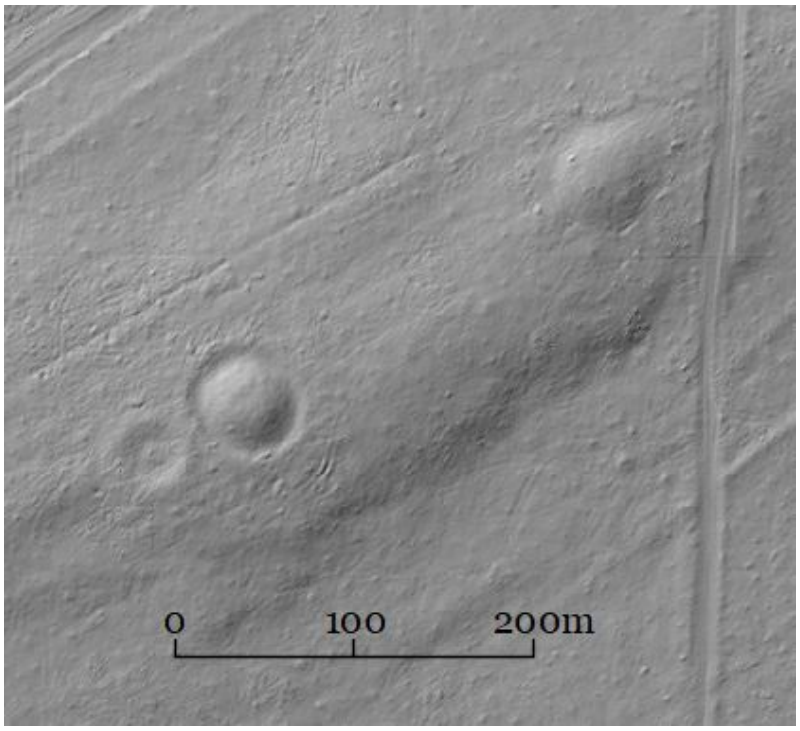

Figure 12 The barrow cemetery at Mount Ephraim, Weeting-with-Broomhill (NHER 63629). Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England.

The barrow group at Mount Ephraim, at Weeting-with-Broomhill, was one of the more prominent, previously recorded sites mapped in Block 4 (NHER

63629). Here the BNG lidar showed the group of two round barrows and a pond barrow elevated on a natural knoll or ridge. The clarity of the lidar visualisation almost certainly reflects the fact that the barrows are under deciduous woodland cover, rather than coniferous plantation The survey was also flown in early spring, when bracken and other vegetation cover would be at a minimum.

The Mount Ephraim barrow cemetery forms part of a cluster of barrow sites, mainly surviving as earthworks, that have been recorded across the southern, forested portion of Block 4. This is itself a continuation of the extensive funerary landscape recorded by Stage 1 of the project on the heathy 'uplands' around Weeting (Horlock and Tremlett 2018, 21). They extend across what is essentially an interfluve, between the Little Ouse to the south, the Wissey to the north and (albeit at a distance) the Fens to the west. In Block 3, barrows were again found scattered across the mainly forested 'upland', although less densely than in the Weeting area, and with less evidence of clustering.

Within Block 4, the barrows are particularly numerous along the Fossditch, and within what was formerly Methwold Warren. There are a number of potential reasons for this. The warren may have contributed to the survival of earthworks, either directly, by preventing or discouraging ploughing, or coincidentally by being situated on poor soils, where agriculture was in any case a marginal pursuit. It is also possible that the mounds were used as pillow mounds by the warreners. Maps of Methwold Warren show what are presumed to be pillow mounds within the warren – one of the few pieces of evidence for the use of such features in the Breckland warrens. Whether existing Bronze Age barrows were used as pillow mounds, or whether some of the mounds recorded were medieval constructions rather than prehistoric, is uncertain.

Several ring ditches were also identified, often within the more open landscapes of the river valleys. Again, the sites comprised a mixture of new discoveries and previously recorded features. Amongst the new sites was a large ring ditch identified at Northwold (NHER 62487). Other ring ditches have been recorded in the vicinity and it is feasible that the feature represents a Bronze Age round barrow. At the same time, alternative interpretations of the site, for example as a post mill site, are also plausible.

In Block 3, funerary sites were the only sites of suggested Bronze Age date recorded by the survey. This does not mean that no Bronze Age non-funerary sites were present or included in the mapping, rather that they could not be readily distinguished as such. In Block 4, a number of rather enigmatic cropmark and soilmark sites, comprising parts of enclosures, trackways and boundaries, were mapped across the northern part of the block. For these, a Bronze Age date is possible but there is little supporting evidence and for most only a general prehistoric to Roman date has been suggested.

Figure 13 A newly identified ring ditch at Northwold (NHER 62487). Photograph EARTH.GOOGLE.COM 02-JUL-2006 ACCESSED 31-MAR-2020 © Infoterra Ltd and Bluesky.

Iron Age

As was the case for Stage 1 of the project, few sites of known or even probable Iron Age date were recorded by the survey. The possible reasons suggested for the relative scarcity of Iron Age sites in the Stage 1 area – avoidance of Breckland's arid climate and poor soils, features of this date being hidden unrecognised amongst sites of later date, or rendered invisible by later land use, and/or Iron Age activity in the area not leaving traces in the landscape that can be detected or recognised on aerial sources – are equally valid for the Stage 2 area. The possible Iron Age features which were mapped by the survey in Blocks 3 and 4 relate to possible enclosures and boundaries.

There are a relatively small number of findspots relating to Iron Age material recorded across Blocks 3 and 4 in comparison to other periods such as the Roman period. The relative visibility of Roman period finds (pottery and ceramic building material, for example) compared to those of Iron Age date, may be a factor, but it could also reflect a genuine avoidance of the area, at least relative to later periods. A concentration of Iron Age features has been recorded by previous work along the Lark Valley in the south of Block 3. This has included multiple excavations at Lackford Bridge Quarry (SHER WSW 030/MSF6985) and West Stow (SHER WSW 002/MSF6943). From the excavations at West Stow, it has been suggested that the settlement pattern in

this section of the Lark Valley consisted of a series of small farmsteads located along the bottom of the river valley (West 1989, 109). The excavations at the site revealed a range of circular huts, storage or rubbish pits, post holes and enclosure systems.

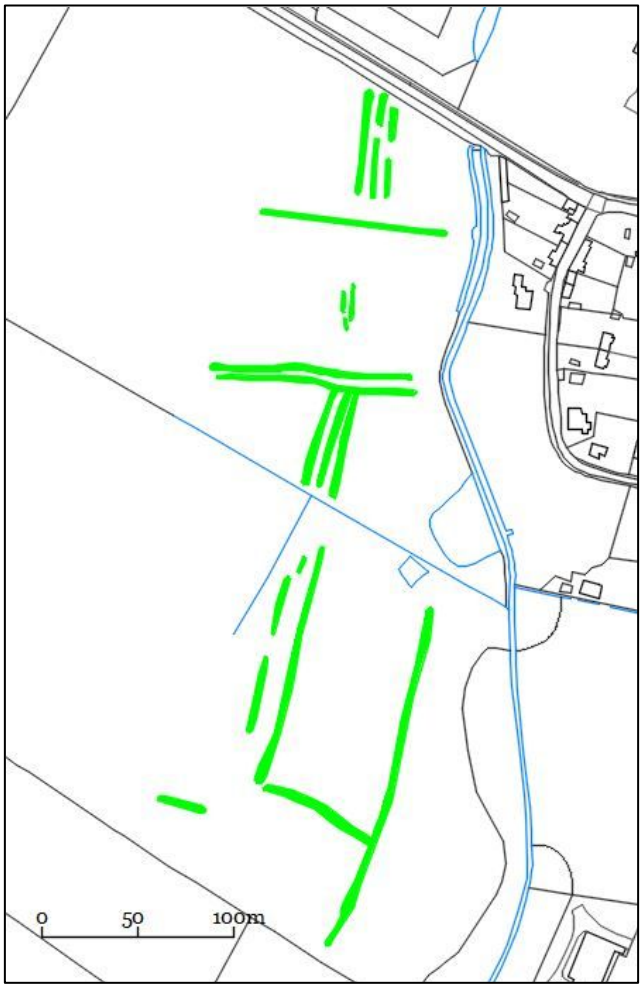

Figure 14 The multiple ditched boundary of possible Iron Age date at Northwold (NHER 63063); ditches shown in green. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Despite this clear evidence for Iron Age settlement at the site, the AIM survey did not record any features at West Stow which could be dated firmly to the Iron Age. Several ring ditches were mapped (SHER WSW 207), but at up to 30m in diameter they are rather large for roundhouses, and could equally (or better) be interpreted as Bronze Age, Anglo-Saxon or post-medieval in date. Groups of overlapping, undated ring ditches, which again could potentially be Iron Age in date, had been recorded to the south of West Stow prior to the survey (SHER LKD 046 and 047). These were identified on unspecified aerial photographs on

display in West Stow Visitor Centre; they were not identified on any of the sources consulted by the AIM survey.

Also in Block 3, and again in the Lark Valley, a large oval enclosure (SHER CUL 052) was recorded within Culford Park (Fig 21). The most likely interpretation of this feature is that it is a post-medieval forestry plantation. Its form, however, is comparable with prehistoric enclosures, and therefore an earlier date cannot be ruled out.

In Block 4, to the south-east of Northwold, three closely-spaced, near-parallel ditches, were tentatively interpreted as a possible multiple ditched Iron Age boundary (NHER 63063; Fig 14). The form of the feature is similar to other examples recorded in Norfolk (Tremlett *et al* 2011, 31–4). However, this interpretation is uncertain, and the feature could instead relate to a trackway of prehistoric or later date, or medieval trackways and boundaries, perhaps associated with a manorial site to the west (NHER 4831) and/or a rabbit warren.

A number of possible multi-period sites and features of unknown date, which may include elements which could possibly date to the Iron Age, were also mapped in Block 4. These include a number of possible enclosures (NHER 63079, NHER 63080, NHER 63081) which could equally be of Roman date and are described in more detail in the section covering that period.

Roman

In contrast to the results from Stage 1 of the project, only a small number of features possibly dating to the Roman period were mapped in Blocks 3 and 4. Those sites that were recorded comprise a number of enclosures and a possible section of Roman road. This scarcity of sites is despite clear evidence from other sources of Roman settlement and other activity in the vicinity of the project area. In Block 3, a dense concentration of Roman settlement features (SHER IKL 167) was recorded from previous work (geophysics, excavation and finds recording) to the west of the project area, and large numbers of finds and a possible burial (SHER IKL 025) were recovered along the Lark Valley in the south. Similarly, Block 4 contains a possible Roman burial (NHER 4981) and records for large numbers of Roman finds, predominantly from the centre of the block. It could be suggested that the low number of Roman sites recorded from aerial sources may be due to the geology, the limited amount of arable land hindering the formation of cropmarks and soilmarks, and the high density of forestry in Block 3 and the south of Block 4 obscuring sites. It may also be the case that at some sites later features, relating to medieval and post-medieval settlement for example, may overlay and obscure any Roman features. This may be suggested for sites such as West Stow in the south of Block 3, where multiple

Roman features (SHER WSW 030/MSF6986), kilns (SHER WSW 002/MSF6944) and finds have been recorded from excavations, but only limited features which could be suggested to date to the Roman period were mapped from the aerial sources.

Figure 15 Rectilinear enclosures, possibly dating to the Roman period, visible as cropmarks at Wordwell; banks shown in red, ditches and pits in green. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

At the same time, while it is undoubtedly the case that large numbers of sites and features of possible Roman date were mapped by Stage 1 of the project, these were almost entirely concentrated along the Little Ouse, and in particular on the open arable land in the west of the Stage 1 area around Hockwold-cum-Wilton, Weeting-with-Broomhill and Brandon. A second group of possible Roman sites was identified at Elveden, where improvements to the A11 led to excavations that provided both direct and implied dating evidence for features mapped by the AIM survey. In fact, these areas were exceptional, and across much of the rest of the Stage 1 area, very few sites or features of Roman date could be identified, again despite other evidence of Roman activity being recorded in the HERs, in the form of finds scatters or small-scale excavations.

Again geology, and in particular land use, which in Stage 1 was also dominated by forestry, are the likely factors behind this apparent 'invisibility' of Roman period sites. It is an issue that has significant heritage protection implications for the entire project area, because although the problem of how to interpret negative evidence is prevalent throughout archaeological practice, it is particularly pertinent in the forestry plantations of Breckland. Here the high potential for good preservation of Roman (or earlier) period sites is hindered by the very low chances of identification, at least using aerial sources.

In Block 3, sections of two probable enclosures, with additional banks and ditches, are visible as cropmarks at Wordwell, overlooking a tributary of the River Lark (SHER WRW 039; Fig 15). The enclosures consist of a bank, flanked by internal and exterior ditches. The additional banks, which lie in close proximity to the enclosures, may belong to the same phase of activity. The rectilinear form of the enclosures suggests that the features are perhaps Roman in date, or even Iron Age. However, it could equally be possible that they are instead medieval, and associated with Wordwell medieval settlement remains which lie immediately to the west (SHER WRW 003), although these do follow a slightly different alignment. The enclosures are also located in close proximity to a possible Bronze Age ring ditch to the north (SHER WRW 097).

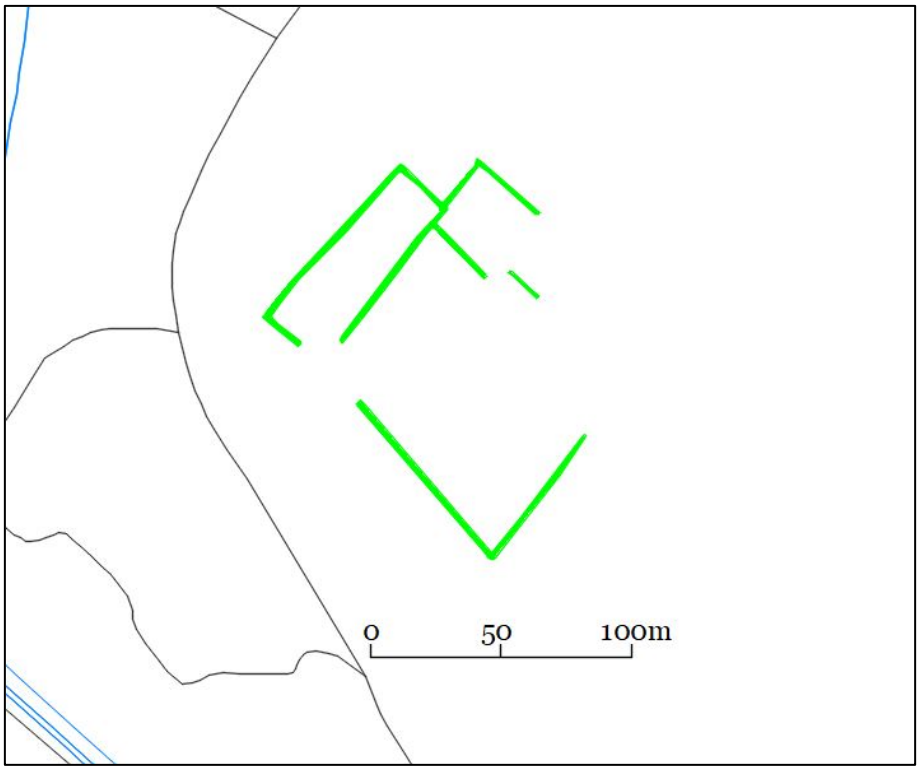

Figure 16 Rectilinear enclosures, possibly dating to the Roman period, visible as cropmarks at Northwold (NHER 63065); ditches shown in green. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Further possible Roman enclosures, again visible as cropmarks, were recorded at Northwold in Block 4 (NHER 63065). The features consist of multiple ditches forming three possible rectangular enclosures. Roman and medieval pottery (NHER 22911) has been recovered from the vicinity of the enclosures and it has been suggested by previous work (*see* NHER 22911) that the enclosures may have related to a former building. However, the size and layout of the cropmarks would be more consistent with enclosures than a building. The cropmark ditches are only seen on one set of frames and only in one year. It is therefore possible that these cropmarks may instead relate to modern agricultural features.

The suggested course of the Icknield Way (SHER IKL 105, IKL 364, IKL 371, ELV 016), a supposed prehistoric trackway and Roman road, runs north–south through Block 3. No features were mapped relating to the Icknield Way which could be dated with any certainty to the Roman period. A large number of earthwork banks and ditches, however, were mapped along its alignment. These are probably a mixture of post-medieval boundary banks, parish boundary banks and possible medieval and/or post-medieval hollow ways. Certainly, while the origin and date of the route itself remains unclear, it has acted as a significant marker for land division in the medieval to post-medieval period.

A possible section of previously recorded Roman road (SHER WSW 036) was mapped in Block 3 from cropmarks seen on an oblique aerial photograph. The feature consists of a bank or track, with sections of ditch either side. A further section of track or road can possibly be seen joining from the south-east. The mapped section of possible road is on the approximate alignment of a suggested Roman road between Pakenham Fort to the east and the settlement at Icklingham, just beyond western limit of the survey (SHER WSW 069).

A previously recorded earthwork barrow (SHER CUL 003) was mapped by the survey from visualised EA lidar data, in close proximity to the suggested alignment of a Roman road (SHER IKL 064). It has previously been suggested that the condition, shape and location of the barrow, and its potential association with the road, may indicate that it is Roman in date. No further evidence to support this suggestion has been recorded, either by previous work or this survey, and it seems more likely that the mound is Bronze Age. A possible Bronze Age ring ditch (SHER CUL 075) lies a short distance to the south-east.

A number of possible multi-period features and sites, and features/sites of unknown date which could include elements of Roman date, were mapped in Block 4. This includes several possible rectilinear enclosures: NHER 63079, NHER 63080, NHER 63081. The last of these (NHER 63081), a broadly square enclosure located at Didlington, is one of a group of closely spaced features that includes a possible ring ditch and a number of ditches on multiple alignments.

While no element of the site is dated, it is likely that some could be of Roman date, while others may be earlier, perhaps Bronze Age.

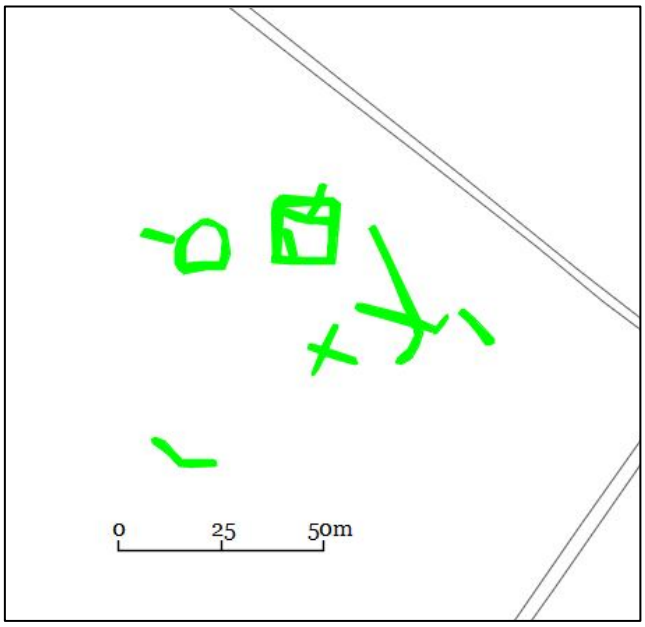

Figure 17 The undated enclosure, ring ditch and ditches visible as cropmarks at Didlington (NHER 63081); ditches shown in green. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Anglo-Saxon

Sites of Anglo-Saxon or early medieval date are typically difficult to identify from aerial sources. In part, this is due to their tendency to be 'invisible', even under conditions where they might be expected to be seen, as cropmarks for example. It is also the case for some sites that a lack of readily identifiable features, such as sunken featured buildings, makes them difficult to interpret as being Anglo-Saxon in date, in the absence of direct dating evidence from excavations or similar.

Despite this, a number of sites dating to this period were recorded by the project. In Block 3, the survey covered the nationally significant site of West Stow, an excavated early Anglo-Saxon settlement. The extensive excavations recorded numerous (67) sunken featured buildings, and over 2000 post holes, some representing the remains of post-built halls (SHER WSW 002/MSF6945). A reconstructed village now occupies part of the site. Despite this wealth of well-dated features, the AIM survey recorded relatively few features which could be suggested to date to the Anglo-Saxon period. Banks, ditches, ring ditches, braided trackways and strip fields (SHER WSW 207) were mapped at the site and in the surrounding area. It is possible that the banks, ditches and braided

trackways originated in the Anglo-Saxon period and continued in use. Like the strip fields, however, these features are more likely to be medieval to post-medieval in date. Similarly, a large ring ditch recorded at the site may be an Anglo-Saxon feature, but it could equally be of Neolithic, Bronze Age, Iron Age or post-medieval date, given the large number of multi-period features recorded by the excavations at West Stow (SHER WSW 002) and nearby Lackford Bridge Quarry (SHER WSW 030).

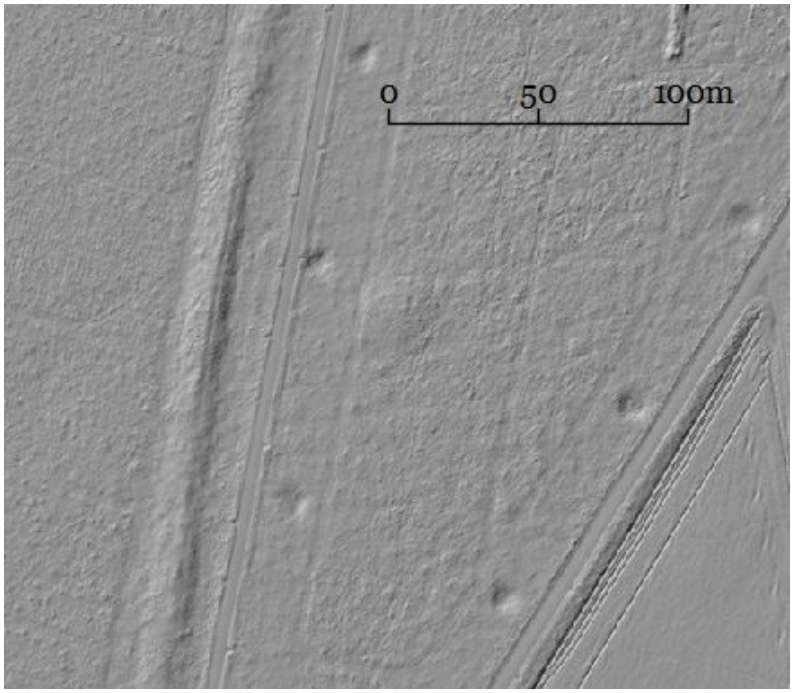

Figure 18 A segment of the Fossditch (NHER 1089) on what was formerly Cranwich Heath, with a newly identified barrow mound (NHER 63617) a short distance to its east. Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England.

In Block 4, the most substantial feature dating to this period to be recorded by the project was the Fossditch or Devil's Dyke (NHER 1089). This linear earthwork – most apparent as a bank, rather than a ditch – runs for approximately 10km between the River Wissey and the Little Ouse. Its southern portion was mapped as part of Stage 1 of the project; Stage 2 has involved the mapping of the northern portion, stretching for a little under 5km, from the Hockwold-cum-Wilton parish boundary to the River Wissey. The feature was primarily mapped from the recent (2015) BNG lidar, and this has included mapping segments which fall outside of or extend beyond the current mapping for the NHLE Scheduled Area (*see also* Appendix 4). A section close to the southern end of the boundary was excavated where it crosses the Roman settlement at Hockwold, and this segment at least is demonstrably of post-Roman date. The fact that several parish boundaries, and the boundary of

Methwold Warren, run along the Fossditch also suggest that this is a feature of some antiquity (as for the Icknield Way, described above). At the same time, as was described in the Stage 1 report, the boundary appears to have been laid out with reference to several of the Bronze Age round barrows that are scattered across this area (Horlock and Tremlett 2018, 29–30, fig 10). This pattern was also evident in the results from Stage 2, with several probable or possible barrows – several of them new discoveries – being mapped in the vicinity of the Fossditch (Fig 18). It is of course possible that at least some of the barrows are not Bronze Age but Anglo-Saxon in origin, or that they were at least re-used in this period. So few (if any) of the Block 4 examples have been excavated, however, that there is little evidence to either support or refute this. As suggested in the Stage 1 report (Horlock and Tremlett 2018, 32), a more in depth and focussed review of all the evidence for this period from Breckland, not just that visible on the aerial sources, might allow a more meaningful examination of this research topic. For example, the distribution of specific Anglo-Saxon artefact types might be correlated with the location of barrows.

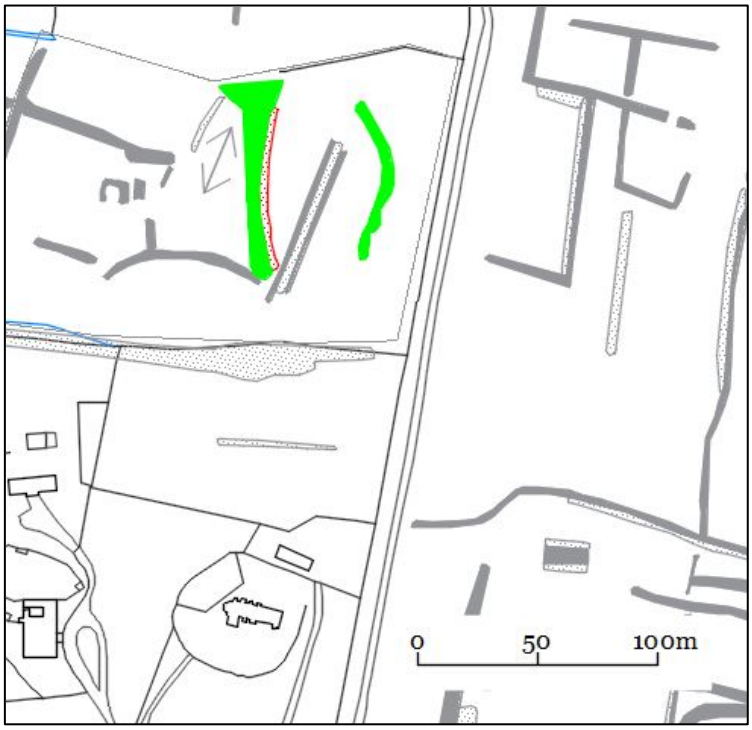

Figure 19 The possible oval enclosure at Cranwich (NHER 63072); bank shown in red, ditches in green. The outline of St Mary's Church can be seen 150m to the south. The medieval settlement remains that surround the site are shown in grey. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

In Block 4, a possible Anglo-Saxon enclosure was recorded at Cranwich, from aerial photographs and visualised lidar data (NHER 63072). It is situated in close proximity to a large area of medieval settlement remains, and a short

distance to the north of the church. The feature consists of two ditches and a bank forming a roughly oval shape. This may relate to an enclosure, or may simply be the result of a possible medieval hollow way and boundary ditch being in close proximity to each other, fortuitously forming a roughly oval shape. A possible trackway, aligned approximately north-east to south-west, crosses the centre of the possible oval feature. A possible Anglo-Saxon date has been suggested for the conjectured enclosure, due to its similarity in form to a probable Anglo-Saxon manorial enclosure recorded at Gressenhall, Norfolk, by a previous AIM survey (Horlock *et al* 2008, 344, fig 5). The Cranwich 'enclosure' shares similarities with the Gressenhall enclosure, such as the sub-oval form and the position of the feature in relation to a church. However, the Cranwich enclosure is smaller than the Gressenhall enclosure, measuring approximately 50m by 60m with a 4m wide ditch, compared to 109m by 80 m with an 8m wide exterior ditch at Gressenhall. The ditches of the possible enclosure at Cranwich are visible as low earthworks on the visualised EA 2m resolution lidar, and further work – such as a field visit and/or survey – could help to interpret this feature with more certainty.

Medieval

It has been difficult in many instances to clearly distinguish between sites of medieval and post-medieval date (not that this is always a useful distinction). This was a problem that was also encountered during Stage 1. Some sites may span both periods, but many are likely to be of later rather than earlier date. They are discussed with the results for the post-medieval period, even when an earlier origin is plausible.

The most distinctive sites, where a medieval date can be regarded as highly probable if not a certainty, are those relating to settlement. So numerous were such sites along both the Lark and the Wissey valleys – that is, in both Block 3 and Block 4 – that they are discussed in their own separate Research Theme section below. The density with which such sites were recorded was quite remarkable; such a wealth of evidence relating to medieval settlement in such a confined area had not previously been encountered by the mapping team. It is also the case that the Breckland sites have a distinctive character that was seen repeatedly, not only in Stage 2 of the project, but also in Stage 1 and during earlier work in the environs of Thetford. *See* the Medieval Settlement Research Theme below for further discussion. Related sites, such as manorial sites, moats, and medieval agricultural features (ridge and furrow, field boundaries) also discussed in the Research Theme section.

Rabbit Warrens

One of the most distinctive and significant aspects of Breckland's medieval landscape was the vast areas that were used for warrening. Warrens, and features related to warrening, were a dominant feature of the Stage 1 mapping, and they were discussed in detail in the Stage 1 report (Horlock and Tremlett 2018, 60–81). By contrast, only limited evidence of warrening was recorded during Stage 2 of the project. This was to some extent surprising, given the quantity, variety and density of evidence from Stage 1. However, unlike Stage 1, the Stage 2 mapping blocks generally encompassed only small parts of a few documented warrens. Also, for many of those it did cover, the record is comparatively poor, and their extent uncertain.

In Block 3, various boundaries were recorded, most of which were probably of post-medieval date (*see below*). Some of these could have been warren boundaries. The entirety of the recorded location of Wordwell Warren (SHER WRW 043), for example, lay within the project area. Compared to the warren boundaries mapped by Stage 1 of the project, however, these boundaries were not particularly distinctive, and they could instead be field or (more probably) plantation boundaries. A more typical, double and in places triple-banked boundary was mapped along the eastern edge of Eriswell Warren (SHER ERL 102), but the greater part of the warren itself lay outside of the project area.

The south-west corner of Block 4 fell within the recorded extent of Methwold Warren (NHER 55577). Again, some of the banks mapped along and within this boundary could be associated with the warren, but they could equally relate to later land use not associated with warrening. Part of the boundary appears to have been formed by the Fossditch (*see above*; Breckland Society 2010, 26). As discussed above (in the section covering the Bronze Age), it is possible that some of the mounds recorded in the area of the warren are pillow mounds rather than round barrows, and/or barrows that were re-used as pillow mounds. In the north-east corner of Block 4, the survey mapped boundaries (most previously recorded) possibly associated with Langford/Ickburgh Warren (NHER 63053, 63050). In addition it mapped a mound, also recorded previously, that lies below the ruins of Langford warrener's lodge (NHER 5039). The mound (NHER 44216) could have been created when the lodge was constructed, or could be the remnants of a pre-existing mound, such as a Bronze Age round barrow. The ruins of the lodge itself were not mapped, as it is depicted on historical Ordnance Survey maps.

Post-Medieval

The majority of sites recorded by the project were of known or probable medieval to post-medieval date. This continued a trend evident for Stage 1. This

dominance was particularly true of those parts of the project area covered by forestry plantations, although the distinction was not perhaps quite as clear as it was in Stage 1. The 'muting' of what was quite a pronounced feature of the Stage 1 mapping – the almost total domination of the results by medieval and post-medieval features in the forestry plantations, the spread of Roman (and possibly earlier) sites and features on more open areas – has a number of possible factors. The more mixed landscape and land use (historical and modern) of the Stage 2 area, and the dislocation of the two mapping blocks, undoubtedly played a role. So did the more open river valleys that exist in each of the blocks; the Little Ouse, which cuts through the Stage 1 area, is much more hemmed in by forestry than either the Wissey or the Lark, limiting the open pasture on which medieval settlement remains, for example, were likely to be identified. The relative scarcity of rabbit warrens and warren-related features is also likely to be a significant factor, both in terms of the types of sites and features that might have once existed, and their potential to be preserved.

Also in common with the results from Stage 1, in many cases it has been difficult to distinguish sites of medieval date from those dating to the post-medieval period. Many of the sites described below could feasibly have origins in the medieval period, or represent a continuation of land use – or, where relevant, land division – from the medieval period (or earlier). Similarly, several of the sites described below may have continued in use into the 20th century.

Enclosures

The project mapped a variety of enclosures, most of which are effectively undated. A post-medieval date could be suggested for some of these, although an earlier origin cannot always be ruled out. Two large earthwork enclosures, probably defining former post-medieval forestry plantations, were recorded in the centre and south-west of Block 3 (SHER WSW 157 and CUL 052). Four smaller rectilinear enclosures (SHER ELV 178, ELV 179, BNH 170 and BNH 131), all now levelled and all located on former heathland, were recorded in the north of Block 3. These were probably stock enclosures. No equivalent enclosures were identified in Block 4.

One of the larger earthwork enclosures in Block 3 was newly identified in the parish of West Stow, within King's Forest (SHER WSW 157). The roughly D-shaped enclosure is defined by a bank, and can be seen as an earthwork on aerial photographs and visualised lidar data. Two possible sections of an exterior ditch are visible on its northern side. It measures approximately 123m by 115m. Although an early (perhaps Roman or even prehistoric date) cannot be ruled out, this enclosure most resembles a post-medieval plantation boundary, similar to those depicted across the project area on 19th-century maps. The prominence and definition of the earthworks also suggests a

relatively late date. The enclosure is cut by a forest ride (still in use), which runs roughly through its centre. The latter is mapped on the 1st edition 6 inch Ordnance Survey map, but the enclosure is not.

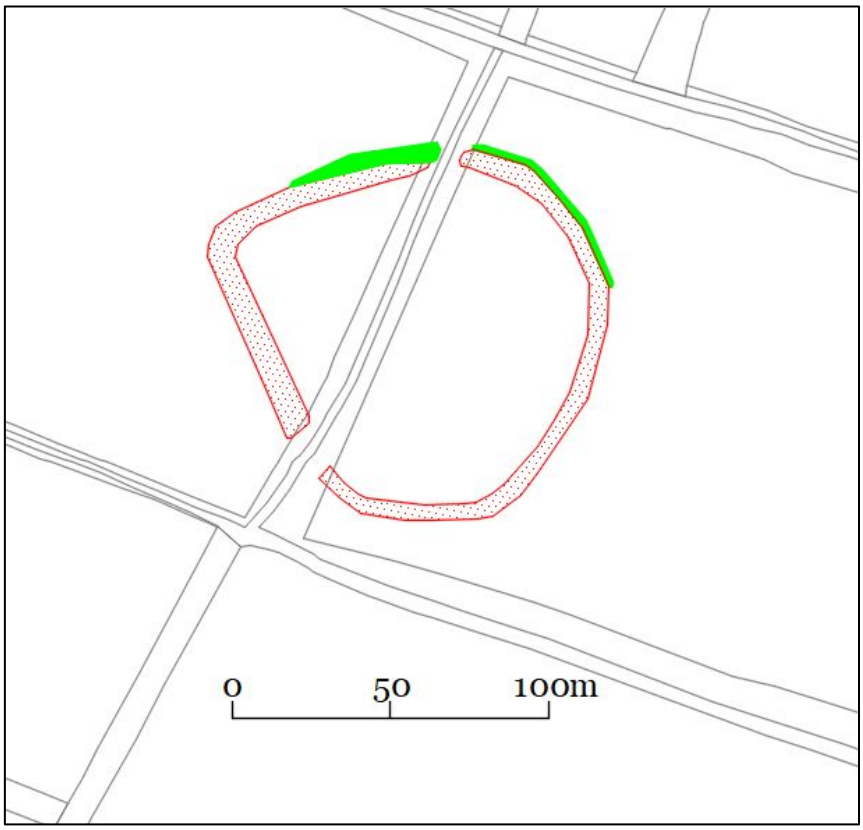

Figure 20 The D-shaped enclosure recorded in King's Forest (SHER WSW 157); banks shown in red, ditches in green. It probably represents the remains of post-medieval plantation enclosure. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

A second large curvilinear enclosure (SHER CUL 052) had been recorded previously within Culford Park. It is visible as an earthwork on historical aerial photographs and visualised EA lidar data. The interior of the enclosure measures approximately 143m by 180m, and is defined by a ditch measuring approximately 10m in width. Again, while an early (perhaps Bronze Age or Iron Age) date for the enclosure is possible, the prominence and definition of the earthworks on both 1940s aerial photographs and on visualised lidar data is more indicative of a relatively late, post-medieval date. The enclosure is not depicted on the 1st edition 6 inch Ordnance Survey map, although the map does show that the outline of the north-eastern side of the enclosure was followed by the boundary of Dixons Covert, within which the enclosure lay. On the visualised EA lidar data a low earthwork bank can be seen crossing the interior of the enclosure north-west–south-east. This follows the alignment of the

boundary of Dixons Covert, where it continues beyond the enclosure to the north-west and south-east. This gives the impression that the enclosure was imposed on top of the plantation boundary, removing the section within the enclosure, a scenario which, if correct, would indicate a relatively late date for the enclosure. An intriguing possibility is that the enclosure relates in some way to the 18th-century army camps recorded in the vicinity from cartographic and bibliographic sources (SHER CUL 037). These encampments, however, are described as being rectangular rather than oval in form. An alternative possibility is that the feature relates to a post-medieval plantation enclosure, similar to that recorded at West Stow (described above). Its comparatively large size and the fact that it is defined by a ditch rather than a bank would make it relatively unusual amongst the plantation enclosures encountered by the project, but this could reflect its relatively low-lying position and its location within parkland. Most of the plantation enclosures identified by the project – many of which are depicted on 19th-century maps, and therefore outside the scope of the project – were on higher ground, within the modern forestry plantations. Despite these uncertainties about its date and function, it is surprising that such a prominent earthwork has not received more archaeological attention.

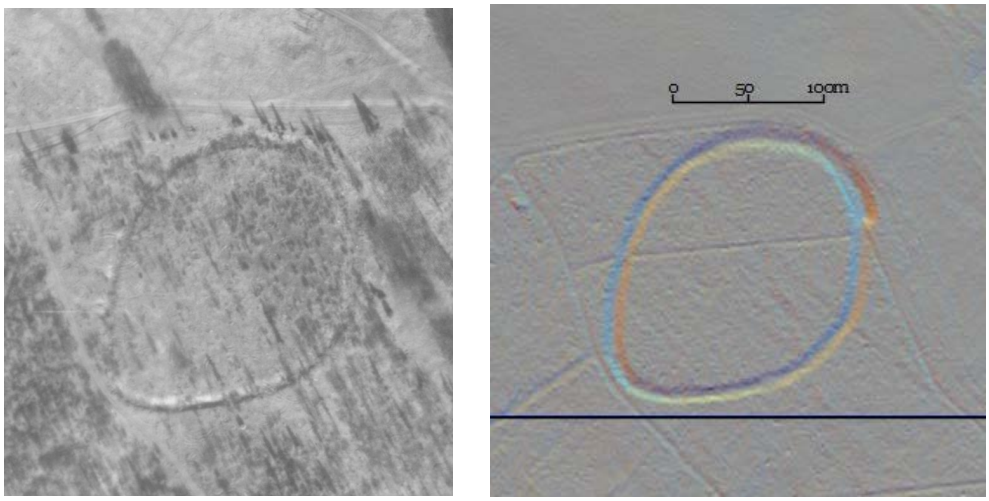

*Figure 21 The oval enclosure within Culford Park (SHER CUL 052), visible on a 1946 aerial photograph (*left*) and visualised lidar data from a survey in 2019 (*right*); the black line visible to its south on the lidar extract is an artefact. Photograph RAF/3G/TUD/UK/61 V 5067 05-FEB-1946 Historic England Archive (RAF Photography; detail). Lidar source: LIDAR TL8269 and TL8270 Environment Agency 1m DTM 18-APR-2019. Visualisation created by Norfolk County Council.*

Amongst the smaller sites, two rectangular enclosures (SHER ELV 178 and ELV 179) are visible as earthworks (since levelled) on historical aerial photographs. The enclosures are depicted on the 1st edition 6 inch Ordnance Survey map, which also shows that they are located on an area of former heathland called

Hall Heath. The features are probably post-medieval stock enclosures, of a kind common on Breckland's heaths (for example, *see* Bales *et al* 2011, 47–8). The enclosures appear to be associated with a number of probable post-medieval banks to the south (SHER ELV 180).

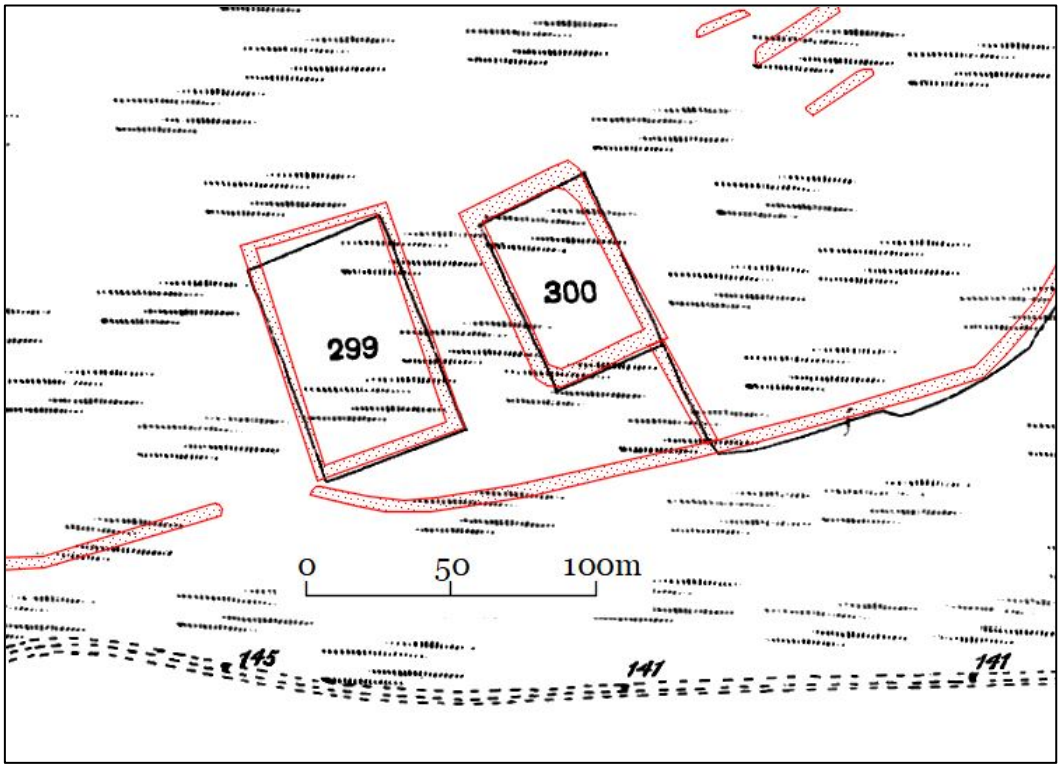

Figure 22 The probable post-medieval stock enclosures on former Hall Heath, Elveden (SHER ELV 178 and ELV 179); banks shown in red. Base map Ordnance Survey 1st edition 6 inch map supplied by SCCAS.

A square enclosure (SHER BNH 170) was mapped at Barnham, in the north-east of Block 3. Again, this was probably the remains of a medieval to post-medieval stock enclosure. The enclosure lies in close proximity to a series of probable post-medieval banks and ditches to the west (SHER BNH 171) and is approximately 600m to the north of the possible site of Wordwell Warren (SHER WRW 043). The enclosure is not visible on the 1st edition 6 inch Ordnance Survey map, but is shown as being located on what was formerly West Calthorpe Heath.

Finally, a trapezoidal enclosure, defined by a bank but with a possible internal and external ditch on its south-west side, was recorded, also at Barnham (SHER BNH 131). The enclosure was again interpreted as a probable medieval to post-medieval (probably post-medieval) stock enclosure. There are a number of banks and possible hollow ways nearby which may be associated with the enclosure, but may also relate to the supposed course of the Icknield Way to the west (SHER ELV 016 and IKL 364). The enclosure is not recorded on the 1st

edition 6 inch Ordnance Survey map, on which the area is again shown to be former heathland.

Boundary Banks

Boundary banks were a dominant feature of the mapping across Block 3 and in the south of Block 4. A number had been recorded previously by earlier fieldwork, including Rapid Earthwork Identification Surveys. The Breckland AIM survey recorded new earthwork banks and enhanced previously recorded sites, principally using the visualised BNG and EA lidar data. A higher number of probable boundary banks were recorded in Block 3 than in Block 4, which could be for multiple reasons, including differing landscape histories, land use and earthwork survival between the two areas.

As discussed above, it was difficult to distinguish banks which may be medieval in origin from those dating to the post-medieval period. The boundary banks were mainly situated in areas of woodland, with some located on areas of former heathland. The banks probably related to landscape features such as tree belts, plantation boundaries, field boundaries, wood banks, trackways and parish boundaries. Some clearly correspond with features depicted on the 1st edition 6 inch Ordnance Survey map.

Further work, including historical map research and field visits, could be used to provide additional information about land use and feature preservation. Due to the high number of boundary banks mapped by this survey, individual sites have not been discussed as part of this section. It is also the case that in most instances, each individual feature is of relatively low archaeological significance; as a group, however, their significance is much greater, and their potential to yield new information about Breckland's landscape history should be recognised.

Agricultural Features

Ridging

As in Stage 1 of the project, blocks of ridges were identified across both mapping blocks. Within the river valleys, features could be identified with relative confidence as ridge and furrow, whether of medieval or post-medieval date. These were usually found in fairly close proximity to medieval settlement. Within the forestry plantations of King's Forest in Block 3 and the southern portion of Block 4, however, where such settlement remains are scarce or non-existent, the interpretation of such features is more difficult. As for many of the examples recorded during Stage 1 of the project (Horlock and Tremlett 2018,

42–4), various interpretations are possible. Some may relate to temporary cultivation taking place on areas of heath and warren, in some cases perhaps to grow fodder crops for rabbits. Others may relate to early forestry plantations.

Figure 23 Areas of ridging (area and alignment shown in turquoise) and boundaries (mapping not shown) visible as earthworks within forestry plantation at Lynford (part of NHER 63252). Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England.

Osier Beds

At Wordwell, in the east of Block 3, a water-filled, sub-rectangular moat had been recorded previously from historical maps (SHER WRW 019). A map of 1800 named the site as 'Osier Cover'. The site consists of a banked enclosure with an exterior ditch and small regular banks and ditches within its interior. The enclosure was possibly linked to a nearby drain or watercourse depicted on the 1st edition 6 inch Ordnance Survey map. It is unlikely that this enclosure represents a moat, when its form is compared to other moats mapped by this survey. It is possible that it may instead relate to a post-medieval osier bed, for growing coppiced willow to produce withies, used for basket making, for example. Possible osier beds were recorded along valley of the Little Ouse by the Stage 1 project (Horlock and Tremlett 2018, 44–6, fig 20). The Wordwell site is visible as an earthwork on 1940s aerial photographs but had been levelled by the late 1950s. It lies in close proximity to features relating to Wordwell medieval settlement to the south (SHER WRW 003).

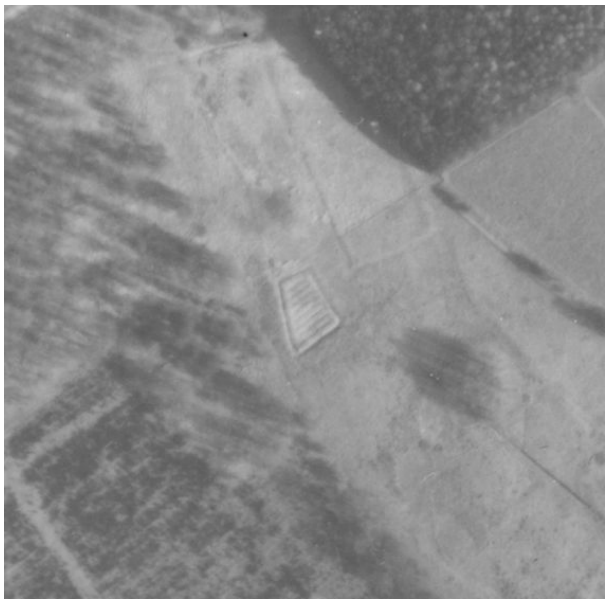

Figure 24 The possible osier bed at Wordwell (SHER WRW 019). Photograph RAF/106G/LA/129 FS 2119 14-FEB-1945 Historic England Archive (RAF Photography; detail).

Stow Water Pit

A possible post-medieval water pit was recorded from visualised BNG lidar at John O'Groats Cottages, West Stow (SHER WSW 160). It is located in the centre of Block 3, on high ground within King's Forest. The site comprises a very large circular pit, with either a circular structure or circular earthwork bank in the bottom of the pit with a hollow in the centre. The circular feature and the hollow may have related to a well and they were perhaps used for the collection of below-ground water or for water management. The visualised lidar data shows that the feature is situated on an area of undulating topography, which extends to the east and west. This could relate to a former watercourse, aquifer or spring. The pit is surrounded by multiple large mounds which probably derive from the spoil from the excavation of the pit. The feature is depicted on modern and historical Ordnance Survey maps as Stow Water Pit. It lies adjacent to a group of buildings, also depicted on historical maps and still extant, named John O'Groats Cottages. One can well imagine that in such a remote location, in the dry Breckland climate with its free-draining soils, and more than 3km from the nearest watercourse, the water pit would have been a vital resource for those living in the cottages, and those engaged in agriculture or forestry in the surrounding area.

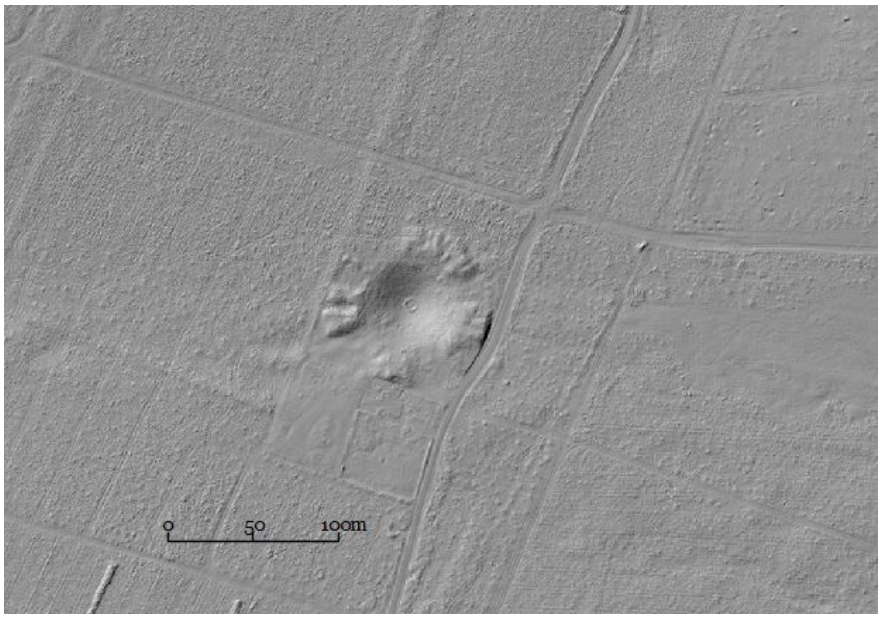

Figure 25 Stow Water Pit; some of the undulating ground to its east and west, which possibly marks the line of a former watercourse, aquifer or spring, can also be seen. Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England.

Flint Mining

In contrast to the results from Stage 1, very little – if any – evidence for post-medieval flint mining was identified in the Stage 2 mapping areas. No sites at all were recorded in Block 3, and only a few tentative examples in Block 4, where other interpretations were usually preferred. Certainly, the widespread, extensive and distinctive earthworks identified in considerable numbers by Stage 1 of the project (Horlock and Tremlett 2018, 46–50) seemed to be entirely absent. To what extent this reflects differences in land use – and/or land tenure – across the project area is unclear. Geological variations and the distribution and accessibility of the floorstone flint preferred for gun flints – the driver behind the Breckland post-medieval flint mining industry – are likely to have played a bigger role in the location of such sites. As discussed in the Stage 1 report (Horlock and Tremlett 2018, 50, 87), there is considerable scope for further research into the origins and history of this industry, and the archaeological remains that it has left behind.

Parks and Gardens

Three post-medieval halls and their associated parks and gardens are situated within Blocks 3 and 4. Possible features relating to parks and gardens were mapped in Block 4, relating to Didlington Hall (NHER 4821 and 40234) and

Lynford Hall (NHER 5150 and 30470). In Block 3, only the remains of an icehouse (SHER CUL 020) were mapped relating to Culford Hall (SHER CUL 021 and CUL 022). Features such as bridges, lakes and walled gardens were seen on the historical aerial photographs of Culford Park, but they were not mapped as part of this survey as the features are recorded in good detail on the 1st edition 6 inch Ordnance Survey map.

Culford Hall

Culford Hall and its associated park and gardens (SHER CUL 021 and CUL 022) are situated in the south-east of Block 3. The present house was built by the First Marquess Cornwallis around 1790, and was extended further for the Earl of Cadogan in approximately 1900. The landscape surrounding the hall has been suggested to consist of approximately 2 hectares of terraced gardens, 2 hectares of pleasure grounds, 200 hectares of parkland and 4 hectares of walled gardens. Amongst other features, the park contains a Grade 1 listed bridge (NHLE 1269105), the earliest known example to be constructed with hollow ribs. The hall is presently used as a school.

With the sole exception of earthworks relating to a previously recorded post-medieval icehouse (SHER CUL 020), no features which could be identified definitively as relating to the park or garden were mapped from the aerial sources consulted by the survey. The icehouse would have presumably serviced Culford Hall. The site was mapped from the visualised EA lidar data, and comprises a mound with a hollow in the centre. This correlates with the position of an icehouse mapped on the 1st edition 6 inch Ordnance Survey map. The top of the structure was apparently demolished in the 1960s.

A number of banks and ditches were recorded within Culford Park (SHER CUL 082 and CUL 085). A proportion of these, at least, could feasibly represent post-medieval garden or park-related features, but they are perhaps more probably a mixture of former post-medieval field boundaries, plantation boundaries, trackways and possible water management features. In addition, a large number of features apparently unrelated to the park were also mapped. These included an undated ring ditch (SHER CUL 084); a large possibly prehistoric or post-medieval oval enclosure (SHER CUL 052; *see above*); part of a medieval moat, possibly the original site of Culford Hall (SHER CUL 034); a large area of medieval and/or post-medieval ridge and furrow (SHER CUL 079); and possible Second World War military training features (SHER CUL 078, CUL 080 and CUL 083).

Didlington Hall

Didlington Hall and its associated park and garden (NHER 4821 and NHER 40234) is situated in the north of Block 4. The hall was originally a 17th-century mansion which was later extended in the 18th and 19th century. Within the elaborate grounds of the hall there was a vinery, peach and pineapple houses, boathouse, lakes, a swimming pool, icehouse (NHER 34562), a garden folly (NHER 4835), duck decoy (NHER 32741), two museums, and an associated hunting lodge (NHER 40826) to the east. The hunting lodge is known as Falconer's lodge and was originally for the practice of falconry on the Didlington Estate, before being subsequently used for entertaining and as a horse training ground. It has been documented that the hall was occupied by the 7th Armoured Division (the 'Desert Rats') during the Second World War, as well as being used as headquarters for the British Second Army (The Breckland Society 2016, 28, 35). The military occupation left the hall in disrepair, ultimately concluding with the demolition of the hall in the 1950s (ibid 28). Didlington has been described as a 'a real stately home', and was considerably more elaborate than other stately homes in Breckland and more widely in Norfolk (Williamson *et al* 2015, 138).

The survey mapped a number of features which may have related to the park and gardens associated with Didlington Hall. A large earthwork bank (since levelled; NHER 62607) and possible associated ditch are visible on historical aerial photographs. The bank is probably post-medieval in date and may have formed a boundary, a garden feature or part of a possible deer park boundary. The bank is depicted on the Tithe Map, and historical Ordnance Survey maps.

The extent of a post-medieval to modern formal garden associated with Didlington hall (NHER 63035) was also mapped by the survey. It is visible on 1940s aerial photographs and consisted of a walled garden with designed flower beds and tree planting. The walls and trees were still present in the 1970s, with traces of the flower beds still visible. The garden had been completely removed by the 1980s. Features such as the lakes, icehouse, folly, duck decoy, hunting lodge and hall are all visible on the aerial photographs but were not mapped by the survey, as they are shown in detail on the 1st edition 6 inch Ordnance Survey map.

Figure 26 The formal garden adjacent to Didlington Hall (NHER 63035). Photograph RAF/3G/TUD/UK/101 RV 6098 30-MAR-1946 Historic England Archive (RAF Photography; detail).

As with Culford a number of other sites were mapped within the grounds of Didlington Hall. These included possible medieval settlement remains to the north of the park (NHER 11758 and 63055), and large amounts of evidence for Second World War military activity within and close to the boundary of the park. The latter included areas of huts and their platforms (NHER 62498, 62499, 62614), possible support structures (NHER 62613) and mounds which may have related to possible spigot mortars or gun emplacements (NHER 62603, 62604, 62610).

Lynford Hall

Lynford Hall and its associated park and gardens (NHER 5150 and NHER 30470) are situated on the eastern edge of Block 4. The existing hall, currently in use as a hotel, is of mid-19th-century date. It replaced an earlier hall, constructed around 1717, that lay to its south. This in turn replaced an older hall, built around 1500, further to the south-west; after the second hall was built, the original hall continued to function as a farmhouse, until its demolition in 1863 (NHER 5150; Williamson *et al* 2015, 200). The parkland surrounding the hall increased over time, and by the late 1850s the park encompassed approximately 105 hectares. The grounds contain a narrow lake to the north of the second hall (south of the current hall) which runs across the length of the estate, a north and south drive, ornamental flower gardens, areas of woodland

and a kitchen garden. Some of the features, such as the lake, are clearly visible on recent aerial photographs.

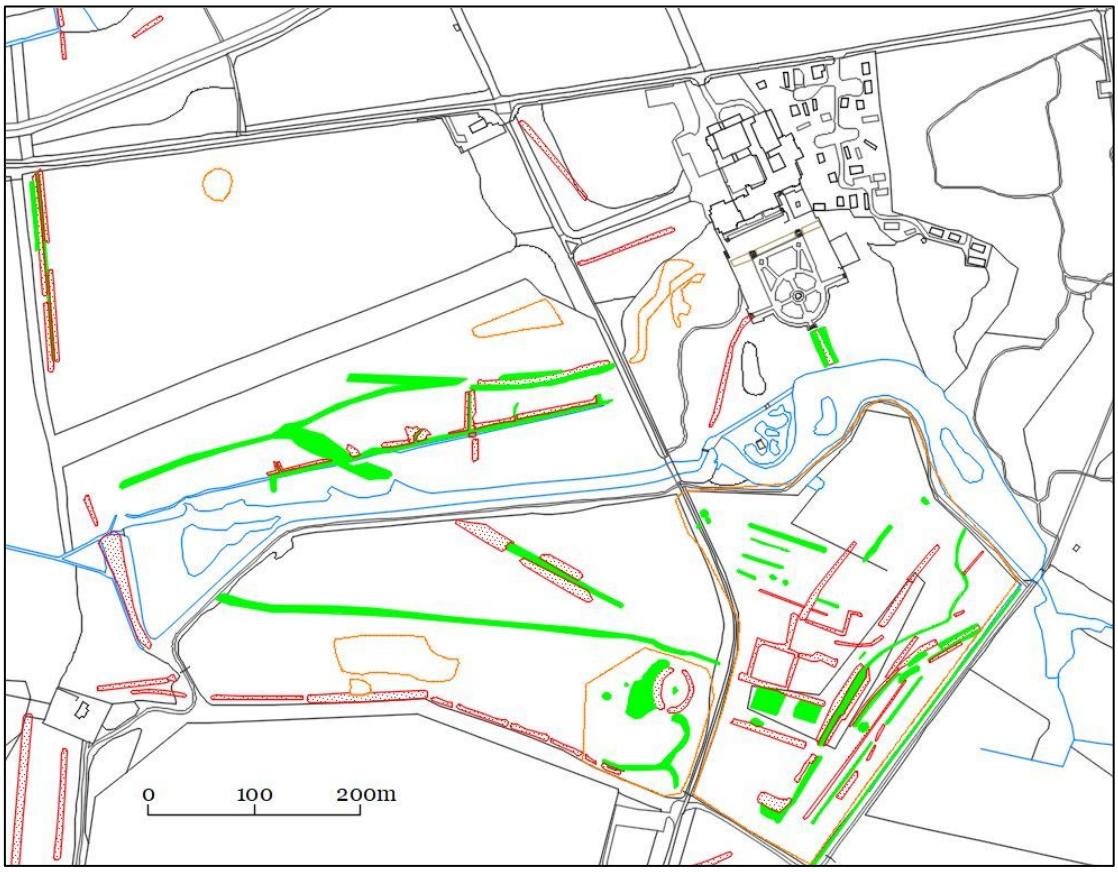

Figure 27 Features mapped within the grounds of Lynford Hall; banks and mounds shown in red, ditches, pits and hollows in green. The current hall is shown towards the top right of the image. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

The grounds surrounding Lynford Hall have been the subject of previous field surveys, which recorded large numbers of earthwork banks and ditches across the park. These features were usually evident on the aerial sources, principally on the visualised BNG lidar data, and were mapped with additional banks identified by the AIM survey. The earthworks relate to several types of feature, including boundaries, extraction pits, garden features, drainage, parkland features, trackways and possible modern forestry features. To the south of the current hall, there is a large group of bank and ditches which probably relate to former garden features and may have been associated with either the current hall (NHER 5150) or the one of its predecessors (NHER 5138). Some elements may relate to the actual structural remains of one or more of the former buildings. To the west of these features there is a large mounded area with a large curved ditch and two large curved banks forming a roughly oval shape.

These features again probably relate to former garden features, as has been suggested by previous surveys. There are further earthworks, which may relate to park or garden features, to the east of the hall, visible on the visualised BNG lidar data. These have not been mapped as they fall outside of the survey area. Further features such as quarries, post-medieval boundary banks (possibly relating to forestry; NHER 63246 and 63247) and a medieval to post-medieval parish boundary bank (NHER 63244) have also been mapped within the area of parkland.

To the north of Lynford Hall, the earthworks of a previously recorded 19th-century floated water meadow (NHER 31242) was visible on both the aerial photographs and the visualised BNG lidar data. The meadows were apparently created in the 19th century by Nathan Lucas of Lynford Hall. Their creation was part of a larger regional trend for reclamation and landscape improvement schemes carried out by large estates. This was evident along the Little Ouse, mapped as part of the Stage 1 project (Horlock and Tremlett 2018, 44–6). At Lynford there are four main areas of earthworks, with a smaller fifth possible area. There is also a mounded area which may have related to a raised trackway and drainage ditches. Further post-medieval water meadows (NHER 31157) can be seen to the east of Lynford Hall, outside of project area.

Figure 28 The water meadows to the north of Lynford Hall (NHER 31242). Associated banks and ditches shown in red and green respectively. Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England.

Twentieth-Century Military Sites

As for Stage 1 of the project, and for earlier surveys undertaken in Norfolk and Suffolk, evidence of 20th-century military activity made up a substantial proportion of the mapping. The availability of aerial photographs taken during and after the Second World War, and sometimes earlier, meant that it was possible to identify and record such sites during or shortly after their period of use. This increased the number of sites that could be identified, and the amount of detail that could be recorded, compared to earlier periods.

The majority of 20th-century military sites recorded by Stage 2 of the project related to military training. These are discussed below in a separate Research Theme section. Although the training sites comprised both First and Second World War activity, and potentially pre- or inter-War activity as well, the non-training related sites recorded by Stage 2 were all of Second World War or later date.

Second World War

Camps

Stage 2 of the survey mapped two former 1930s labour camps, which were re-purposed during the Second World War. The labour camps were originally set up by the Ministry of labour in the 1930s. Unemployed workers living at the camps would have undertaken a range of manual labour tasks to earn their dole money (Skipper and Williamson 1997, 40). Cranwich Camp (NHER 25240) is located in the centre of Block 4. During its Second World War phase the site consisted of a range of huts and support structures such as roads, a possible lawn area or parade ground and a sewage works to the north-west. Some of the huts had been dismantled by the 1950s, with the majority of the camp removed by 1994. Only the earthworks relating to the former concrete tracks, hut platforms and a road were visible on recent (2018) imagery.

A number of pits and embanked pits were recorded to the north (NHER 63069) and south (NHER 63265) of the camp which may have been associated with Second World War activity at the camp. Furthermore, a feature consisting of a long deep trench with three pits connected by ditches around a central mound (NHER 63285) has been mapped approximately 400m to the west of the camp. It is possible that this feature may also have related to Cranwich Camp; it may have been a military training feature or a defensive earthwork.

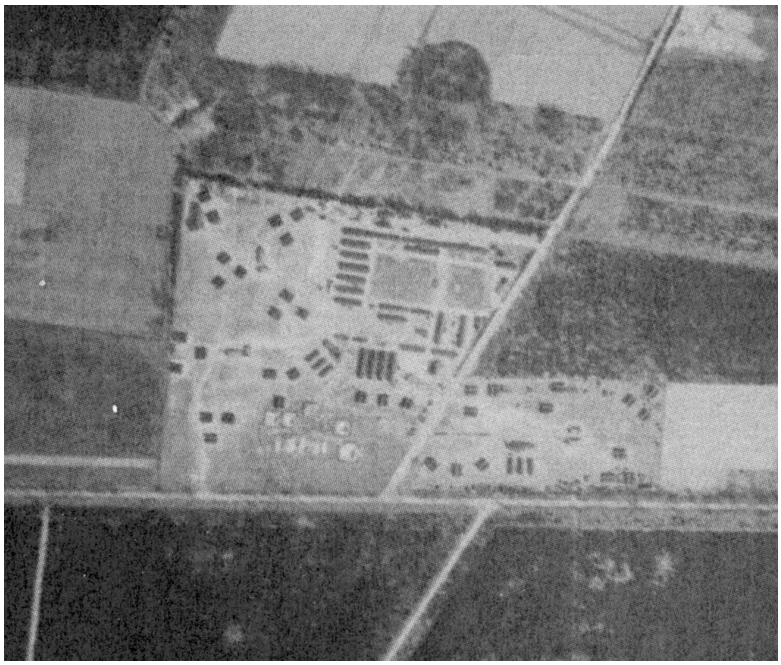

Figure 29 Cranwich Camp (NHER 25240) in 1942. Photograph RAF/HLA/479 FS 2032 13-APR-1942 Historic England Archive (RAF Photography; detail).

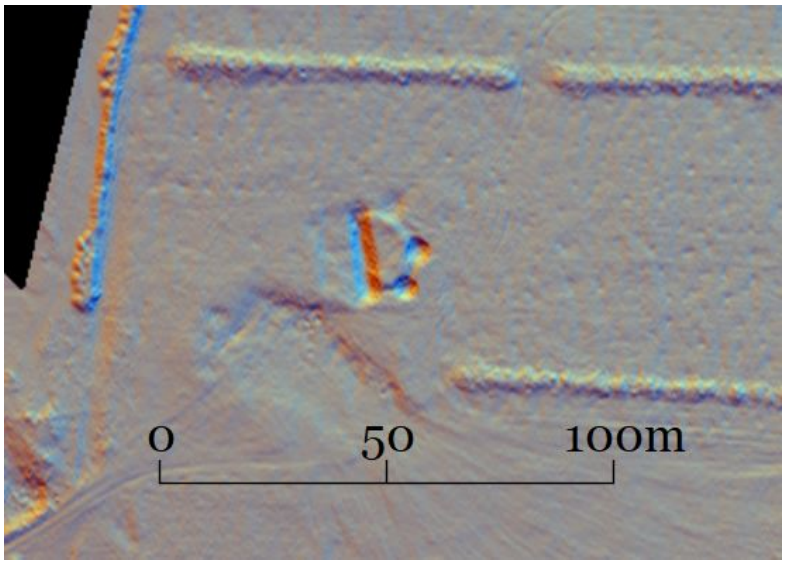

Figure 30 Visualised lidar imagery of a possible Second World War training feature (NHER 63285) located to the west of Cranwich Camp. Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England.

Culford/Wordwell Camp (SHER WRW 032) is situated in the east of Block 3. As at Cranwich Camp, the site was originally used as a 1930s labour camp and was re-purposed during the Second World War. It appears to have been used by the Women's Timber Corp (part of the Women's Land Army), more commonly

known as ‘Lumber Jills’. It was apparently the first national training centre for the Lumber Jills (https://highlodgeheritage.fotf.org.uk/hhhl/human_heritage/high_lodge_ww2_womens_timber_corps_aka_lumberjills.php). On the aerial sources, the camp can be seen to have consisted of a group huts of various sizes, most likely used for accommodation and support structures. A number of earthworks were also recorded to the north of the camp. These consisted most notably of two large square pit features with surrounding banks, two large pits next to a large bank and a large curved bank surrounding a large hut. Finally, an area of probable Second World War extraction was mapped to the north of the earthworks. The specific functions of the earthworks are unknown, but they most likely related to military/land army activity at the camp. The earthworks were very different in form to other Second World War military features mapped by the project. The structures relating to the camp can be seen on the 1940s aerial photographs with most of the huts removed by the 1950s; the site was under arable cultivation by 1960. The majority of the earthworks to the north of the camp had been levelled by the 1950s, but some of the earthworks and the large area of extraction remain visible on the 2015 BNG visualised lidar data.

Figure 31 Culford/Wordwell Camp (SHER WRW 032) in 1945. Photograph RAF/106G/LA/129 FS 2120 14-FEB-1945 Historic England Archive (RAF Photography; detail).

Anti-Landing Obstacles

Probable anti-landing obstacles were mapped in both Block 3 and Block 4. The features were mapped on areas of heathland and open fields, near to areas of Second World War military activity.

A large area of Second World War anti-landing obstacles (SHER ELV 033) was mapped on Larling Heath, in the north-west of Block 3. These features were part of an extensive area of anti-landing obstacles seen extending further west, outside of the project area. The mapped anti-landing obstacles can be seen as earthworks in the 1940s and have subsequently been levelled; some of those to the west still survive as earthworks, for example on Weather Heath, outside of the project area (SHER ERL 083).

*Figure 32 Second World War anti-landing obstacles on Larling Heath. This area has been levelled but the earthworks visible in the field to the west (*centre left*) still survive. Photograph RAF/106G/LA/129 FS 2075 14-FEB-1945 Historic England Archive (RAF Photography; detail).*

Three further possible areas of anti-landing obstacles were mapped within Block 4. NHER 63282 and NHER 63283 were located in the south-west of the block, in the parish of Methwold. They were aligned approximately north-east to south-west and north-west to south-east through the centre of the fields in which they lay. These anti-landing obstacles were possibly associated with Methwold airfield (NHER 4937), which lies beyond the project boundary to the west. The final area of anti-landing obstacles (NHER 63615) was mapped in the centre of Block 4. These were aligned approximately north to south and east to west, with a similar layout to NHER 63283. NHER 63283 and NHER 63615

were seen as cropmarks and soilmarks on the historical aerial photographs, whilst the obstacles mapped as part of NHER 63282 were seen as earthworks which have subsequently been levelled.

Whereas the Block 3 anti-landing obstacles were fairly conventional in appearance, those in Block 4 were more unusual. Rather than a dense grid of substantial ditches, with accompanying spoil heaps, they comprised widely spaced lines made up of mounds and/or elongated pits, arranged perpendicular to each other and crossing in the middle of the field. Similar features were mapped at Weeting-with-Broomhill as part of the Stage 1 project (NHER 62099), although these were thought more likely to be training features than anti-landing obstacles.

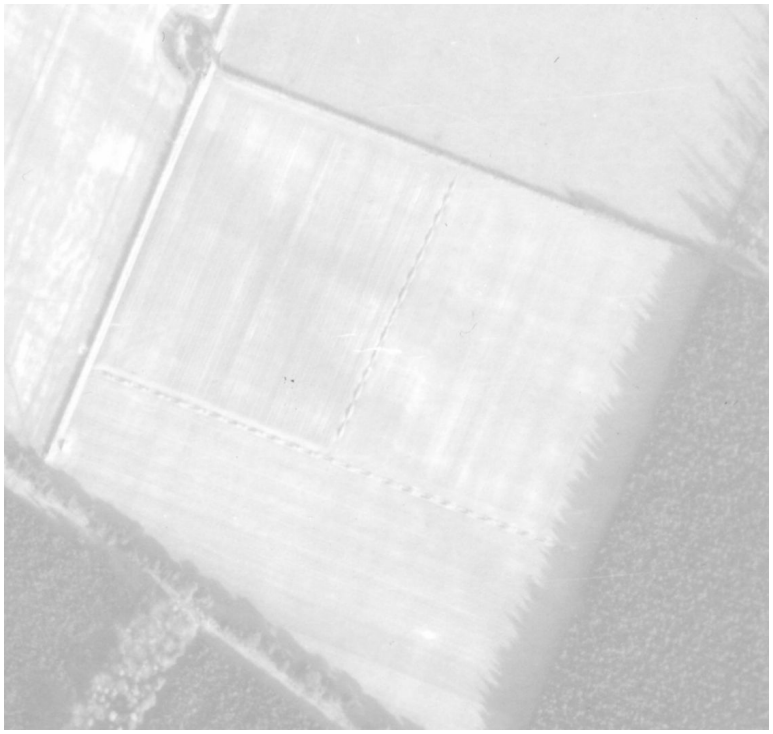

Figure 33 Part of the possible Second World War anti-landing obstacles recorded at Methwold (NHER 63282). Photograph RAF/3G/TUD/UK/59 V 5057 05-FEB-1946 Historic England Archive (RAF Photography; detail).

Defensive Features

Within Block 4, a number of features were mapped which have been interpreted as Second World War defensive emplacements. Three possible spigot mortar emplacements (NHER 62603, 62604 and 62607) were recorded within the parkland surrounding Didlington Hall. All three features are visible as a mound with a hollow in the centre. The majority of these sites have been levelled, with

only one (NHER 62603) still visible on the visualised lidar data from the 2015 BNG survey.

A further possible spigot mortar or gun emplacement (NHER 62610) was mapped to the east of Didlington Park, near an area of huts that probably related to military training (NHER 62614). As with the other spigot mortar emplacements described above, the feature consists of a mound with a depression in the centre. Unlike the other features, however, the mound was surrounded by a section of earthwork bank and a fence. The fence had been removed by the 1950s, but the mound still survived as an earthwork in 2015, when it is visible on the visualised BNG lidar data. Both the surviving sites would benefit from further investigation in the field.

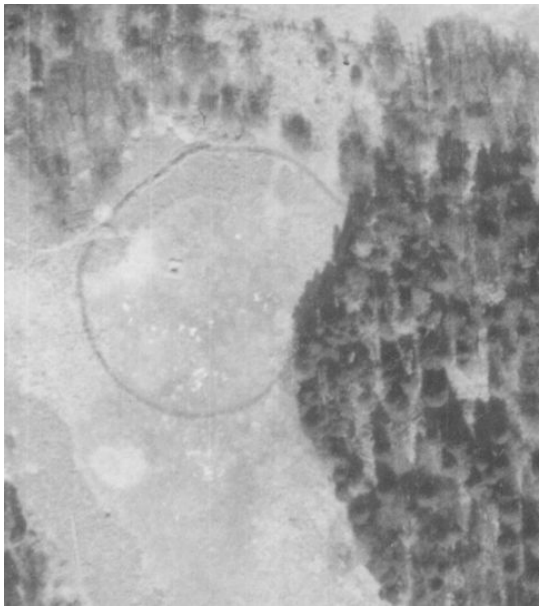

Figure 34 The possible Second World War spigot mortar emplacement (NHER 62610), to the east of Didlington Park. The bank and fence that originally enclosed it can also be seen. Photograph RAF/3G/TUD/UK/101 RV 6097 30-MAR-1946 Historic England Archive (RAF Photography; detail).

Pillboxes

Several pillboxes (SHER LKD 060, LKD 064, FMP 016, FMP 025, FMP 039) were mapped along the River Lark, in the south of Block 3. The majority of the pillboxes had been recorded by previous work (specifically the Defence of Britain project), but the AIM survey recorded one new pillbox from the historical aerial photographs.

The mapped pillboxes vary in type and include a Type 27 (SHER LKD 060), multiple Type 22s, and a Type FW3/28A (SHER FMP 016). A circular hole can

be seen on top of the Type 27 pillbox on the historical aerial photographs. The circular hole may have related to an anti-aircraft gun mount, as suggested by the Defence of Britain survey. The pillboxes were most likely part of the Second World War defensive stop-line that ran along the course of the River Lark. Part of the Eastern Command Line ran through Breckland, along existing lines of defence such as rivers and railway lines (The Breckland Society 2016, 29). Further Second World War features and pillboxes could be seen to the west of Block 3, beyond the limits of the project area.

Further pillboxes were also recorded in Block 4. A roughly square pillbox (NHER 63045) is visible as a structure on 1940s aerial photographs, just to the south of the Second World War military training camp at High Ash (NHER 34704). Its square form suggests that it may have related to a Type 26 pillbox, but it could instead relate to another type, or to a different form of defensive emplacement. The possible Type 26 pillbox is presumed to have been removed between 1975 and 1999, when the area was subject to development.

Again in Block 4, a pillbox (NHER 31605) can be seen between the military training camps at Didlington Hall and High Ash. The structure had been recorded prior to the survey, and was suggested to relate to a Type 22 pillbox with possible 'disruptive lumps' on the roof. The AIM survey has mapped possible defences around the pillbox, consisting of a thin ditch or possibly barbed wire forming an enclosure around the pillbox, with a large amount of possible concrete rubble within the enclosed area. The enclosure had been removed by the 1950s, but the pillbox survives as a structure on recent aerial photographs. It is possible that it was constructed as a defence for the camps.

Cold War

A previously recorded Cold War Royal Observer Corps post at Mundford (NHER 35421) was mapped by the survey. The post is recorded as being opened in 1961 and closing in 1991. It comprised an aircraft observation post and an underground room for measuring fallout in the event of nuclear attack. The post is clearly visible on aerial photographs taken in 1971, on which it can be seen as an earthwork with two areas of possible concrete in close proximity. The post is situated within an area which had previously been occupied by a large number of Second World War huts, part of an extensive military camp and training area (NHER 63082). The earthwork remains of the post can be seen as a mound on visualised EA 1m resolution lidar data.

RESEARCH THEME: MEDIEVAL SETTLEMENT

Medieval settlement has been one of the most dominant themes throughout the Stage 2 mapping, in both Block 3 and Block 4. The areas of medieval settlement recorded by the project are mainly situated within the valleys of the River Lark (Block 3) and the River Wissey (Block 4). This pattern of settlement, with sites concentrated almost exclusively along the river valley bottoms, was also evident during Stage 1 of the project, where most settlement evidence was recorded along the Little Ouse.

As well as being located in the river valleys, the settlement remains are very low lying, often located on the valley floor and immediately adjacent to the river or a tributary. This again follows a pattern seen in the results from the Stage 1 project, and also those from the earlier Norwich-Thetford-A11 NMP Project (Historic England project 5313; Bales *et al* 2011, 48–51). Undoubtedly, this pattern is in part a reflection of differential survival, with earthwork remains relating to medieval settlement surviving in unploughed and unimproved pasture on the valley floor. The density of such sites in the Breckland valleys, however, has not been encountered in other areas mapped by the authors. Nor are there many traces of medieval settlement on the higher ground, despite good earthwork survival on former heaths and warrens, many of which are now occupied by forestry plantations. The clustering of medieval settlement sites along the valley bottoms, therefore, would appear to be a reasonably true reflection of their original distribution.

Another trait of medieval settlement in Breckland, which is very clearly evident in the mapping from both the project reported on here and earlier AIM projects, is the linear arrangement of enclosures and building platforms alongside the flood plain, often backing onto a hollow way or routeway (Cattermole *et al* 2013, 29). This form of settlement is thought to have developed as the population expanded in early medieval times (Cushion and Davison 2003, 107). Often associated with manorial sites, these sites developed at the edges of the flood plain, where both meadow and pasture were available (ibid 1991, 210).

The Norwich-Thetford-A11 NMP Project covered 134sq km (13 per cent) of the Breckland NCA, covering the historic town of Thetford, its environs, and the A11 corridor to its north-east. In the environs of Thetford, it recorded at least nine significant areas of medieval settlement and/or manorial sites, primarily along the valleys of the rivers Thet and Little Ouse (Bales *et al* 2011, 48). Whilst some were extensions of previously recorded earthwork sites, others were newly identified from the historical aerial photographs. The identification of two new areas of earthworks at Brettenham and Rushford significantly altered the known extent of medieval settlement within the study area, and enhanced previously proposed models of development and expansion (*see above*). All the earthwork settlement sites were primarily recorded from aerial photographs taken in the

1940s, although some elements remained extant. At many sites, ground survey might easily have dismissed the features as relating to drainage, as consultation of the later aerial photographs showed that changes in land use and vegetation had obscured the character and archaeological significance of these sites.

Stage 1 of the Breckland project was also notable for its record of medieval settlement, in this case along the Little Ouse. Several large areas of probable settlement were recognised, including some that were entirely new to the HER and some of which were still extant as earthworks. As with sites identified by the Norwich-Thetford-A11 project, it is possible that sites with surviving earthworks, such as that at Barnham (Horlock and Tremlett 2018, 34, fig 12), were previously overlooked as they were believed to relate to drainage.

The following text summarises the main areas of medieval settlement mapped within Block 3 and Block 4. Smaller features, such as isolated medieval to post-medieval boundaries, were recorded by the project but are not included in the discussion below.

Medieval Settlement in the Lark Valley (Block 3)

The River Lark flows broadly east-southeast to west-northwest across the southernmost part of Block 3. There are a number of historic settlements and notable archaeological sites along its course within the block, not least the Anglo-Saxon settlement at West Stow. The section within the project area has been subject to extensive aggregate extraction.

A dense area of medieval settlement remains (LKD 025) was mapped in the south-west of the block, in close proximity to the present village of Lackford. The features probably comprise boundaries, field boundaries, probable house platforms, enclosures, trackways, possible hollow ways and drainage. Two of the possible enclosures can be seen in the south of the site, including a roughly square enclosure and a roughly rectangular enclosure with a raised interior. A probable house platform was mapped in the north-west of the site. Three sections of embanked hollow ways were mapped in the west, south and east of the site. From their alignment, the two sections of hollow way in the south and east of the site were probably once joined, but have been cut by modern houses and gardens. The features can be seen as earthworks on 1940s aerial photographs, but had been levelled by the 1970s. The settlement remains are in close relation to Lackford medieval church (LKD 024) to the east, and an area of possible medieval strip field boundaries to the north-west (LKD 097). A large area of probable medieval to post-medieval boundary banks and ditches (LKD 099) has also been recorded a short distance to the north-east. Medieval finds have been recovered from the area.

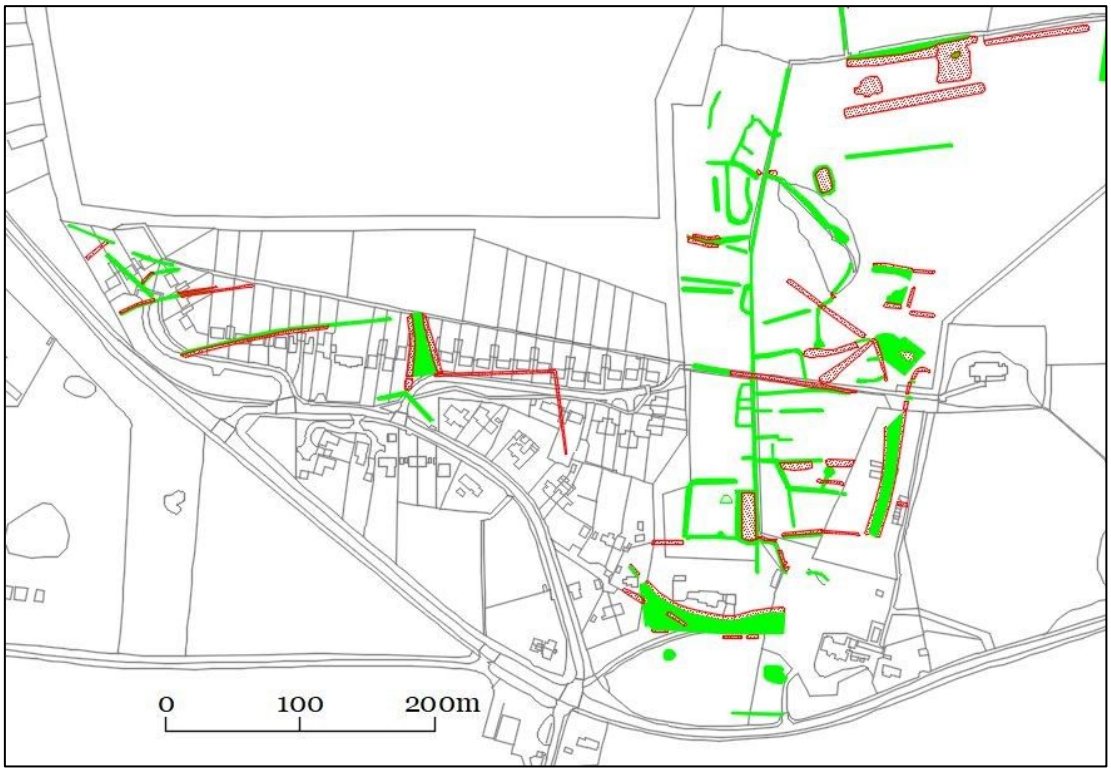

Figure 35 The medieval settlement remains at Lackford (SHER LKD 025); banks, mounds and platforms shown as red; ditches, pits and hollow ways as green. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Approximately 2km to the east of Lackford, a further dense area of medieval settlement remains (FMP 040) was mapped near the modern village of Flempton. The banks and ditches most likely relate to a series of boundaries, field boundaries, possible strip field boundaries, enclosures, possible ponds, trackways and drainage. (It is possible some of the ditch features relate to natural features, and that some of the bank features relate to mounded earth from the clearance of drainage ditches.) A large platform, probably a building platform, within a possible enclosure was mapped towards the northern end of the site, amongst the main concentration of features. A smaller enclosure can be seen in a more isolated position further to the south. This consists of a broad, roughly rectangular exterior ditch with a small internal mound, again possibly relating to a building platform. Further to the enclosures, a large possible causewayed trackway can be seen in the east of the site and three possible strip field boundaries have been recorded in the south of the site. The features can be seen clearly as earthworks on the 1940s aerial photographs, but the majority of the features had been levelled by the 1960s. Some of the ditch features and the large enclosure can be seen well as cropmarks on recent (2015) aerial photographs. Finds of prehistoric to post-medieval date have been recovered from the area, particularly from an area adjacent to the church (SHER FMP 009). These include Saxon, medieval and post-medieval material.

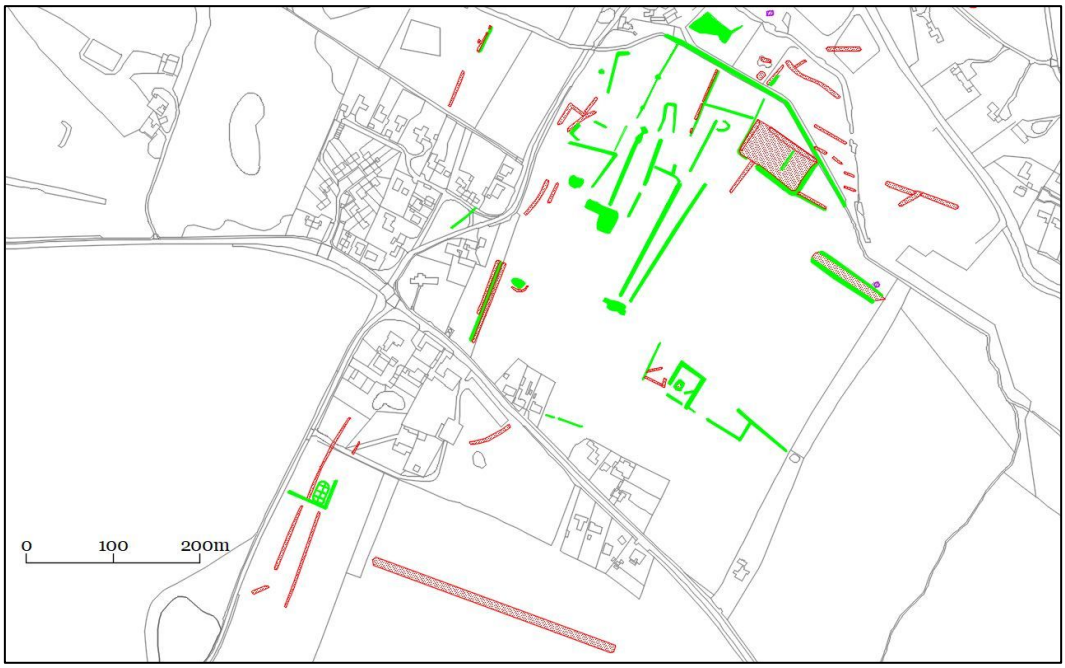

Figure 36 The medieval settlement remains at Flempton (SHER FMP 040); banks, mounds and platforms shown as red; ditches, pits and hollow ways as green. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Figure 37 The main area of earthworks at Flempton when still extant in 1947. Photograph RAF/CPE/UK/1921 RP 3003 16-JAN-1947 Historic England Archive (RAF Photography; detail).

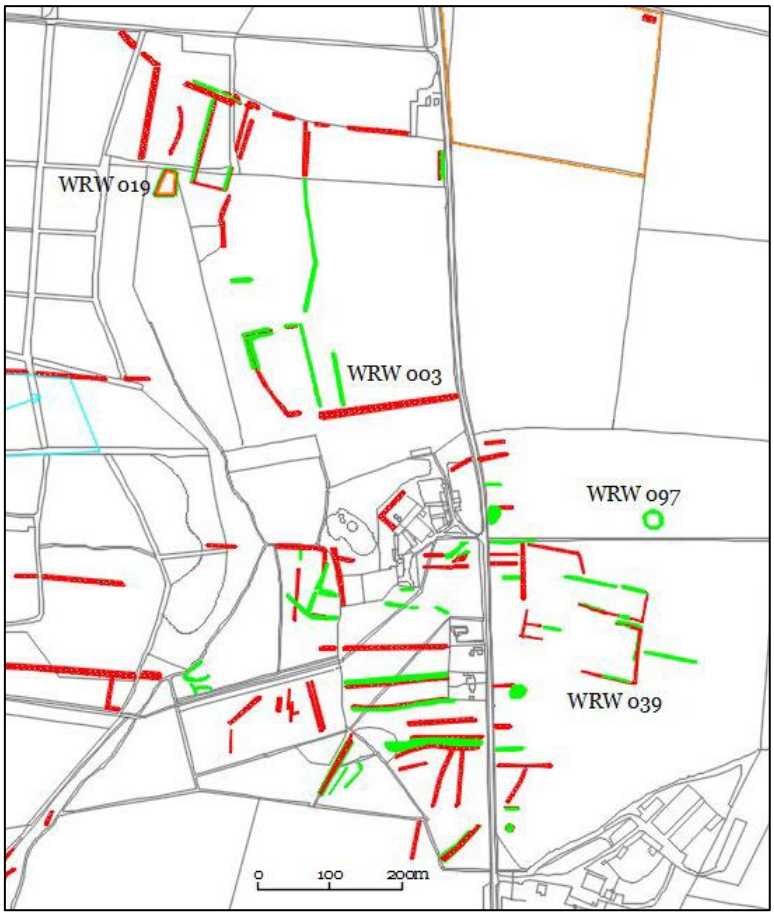

Figure 38 The medieval settlement remains recorded at Wordwell (SHER WRW 003); banks depicted as red, ditches and pits as green, extent and alignment of ridge and furrow in turquoise. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Medieval settlement remains (SHER WRW 003) have been mapped around the modern settlement of Wordwell. The majority of the features most likely relate to medieval field and property boundaries, pits, two possible enclosures, medieval and post-medieval drainage, medieval trackways and embanked trackways. It is possible that some of the banks relate to post-medieval boundaries and trackways seen on the 1st edition 6 inch Ordnance Survey map. It is also possible some of the banks and ditches relate to modern drainage. In the west of the site there is an area of possible low ridges which may have related to ridge and furrow; however, it is possible that they instead relate to geological features or modern tree planting. A possible post-medieval osier bed has been mapped in the north of the site (SHER WRW 019; *see above*). The medieval settlement remains are in close proximity to two possible Roman or medieval enclosures (SHER WRW 039) and a possible Bronze Age ring ditch (SHER WRW 097) to the east. Medieval pottery scatters (SHER WRW 004, WRW 005, WRW 011, WRW 012, WRW 013) have been recovered from the

vicinity, supporting a medieval date for the features. The features can be seen as earthworks in the 1940s, but had mostly been levelled by the 1970s. Some of the banks and ditches remain visible as earthworks on the recent (2015) BNG lidar data.

Some less extensive areas of banks and ditches were also mapped in Block 3 which may have related to medieval settlement. An area of banks and ditches was recorded in close proximity to West Stow Hall (SHER WSW 047), to the north of West Stow village in the south of Block 3. The banks and ditches most likely relate to a series of medieval to post-medieval boundaries, field boundaries, possible garden features, trackways and drainage features, possibly associated with the hall. The majority of the features can be seen as earthworks on the visualised BNG lidar data, and probably still survive.

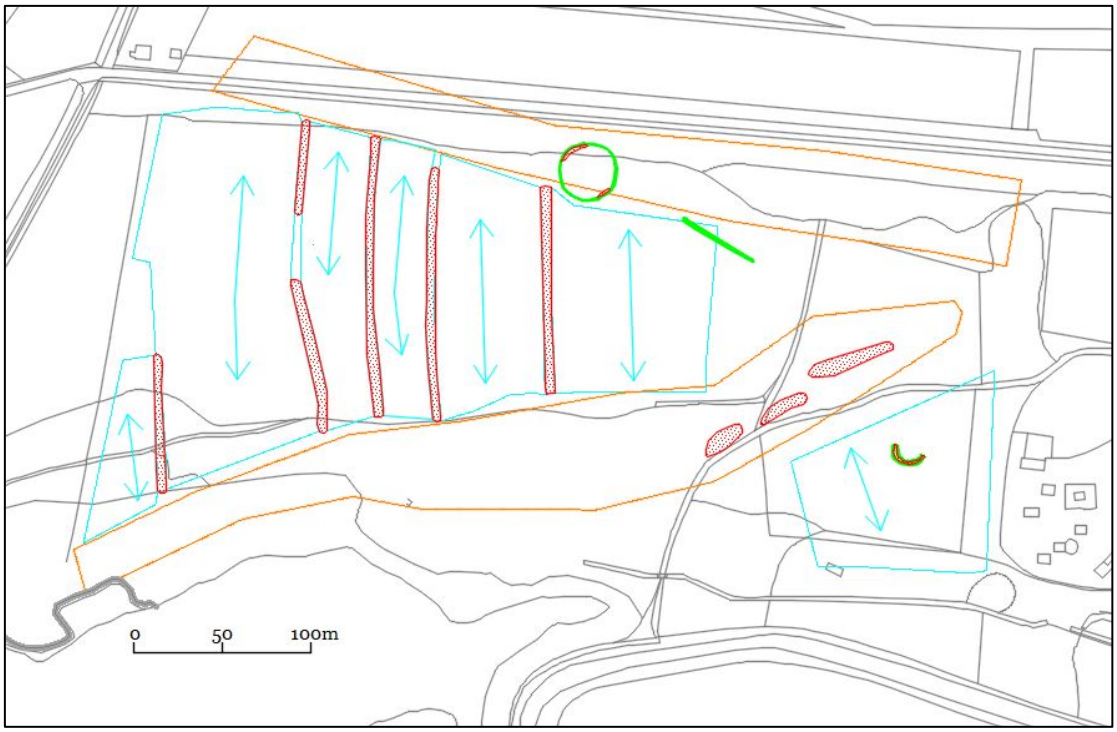

Figure 39 The probable strip fields recorded at West Stow (SHER WSW 207); banks are shown in red, ditches in green, extent and alignment of ridge and furrow in turquoise, extent of braided trackways in orange. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Features of unknown but probably varied date were recorded in the vicinity of West Stow Anglo-Saxon settlement (SHER WSW 207). Some may relate to medieval settlement and agriculture, including an area of probable strip fields mapped in the west of the site. These consist of boundary banks between blocks of ridge and furrow, with a further possible area of low ridge and furrow recorded to the south-east. The probable strip fields and ridge and furrow were

visible as earthworks until the 1970s, when they were presumably levelled. It is also possible that some of the undated banks and ditches mapped in the east of the site may relate to medieval boundaries, but an earlier or later date for these features is also feasible.

Medieval Settlement in the Wissey Valley (Block 4)

The River Wissey flows broadly south-east to north-west across the northern half of Block 4. The landscape is 'emptier' than along the Lark Valley in Block 3, perhaps due to a relative lack of 20th-century development and expansion. The main areas of modern settlement along its length (within the project area) are Mundford and Northwold, with smaller villages at Ickburgh, Cranwich and Didlington. Limited areas have been exploited for aggregate extraction, at Lynford (north of Lynford Hall and north-east of Mundford) and Cranwich (north-west of the medieval settlement remains).

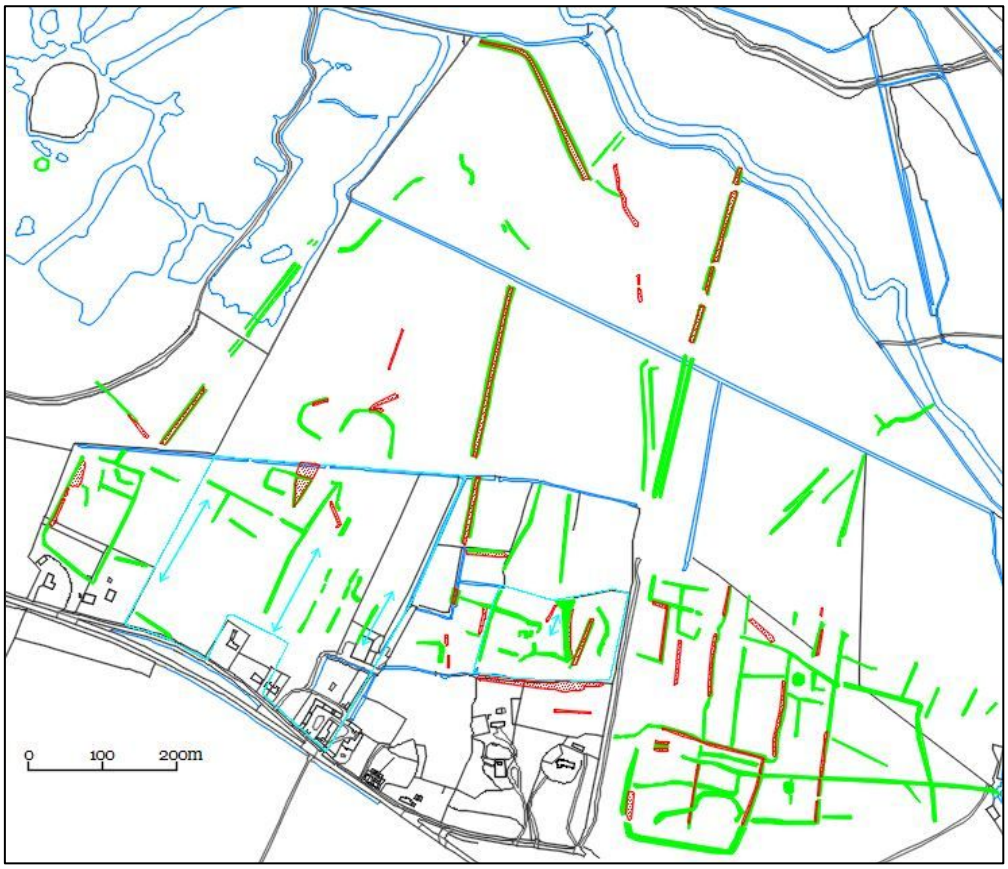

Figure 40 The medieval settlement remains recorded at Cranwich (NHER 63072 and 1039); banks are shown in red, ditches in green, extent and alignment of ridge and furrow in turquoise. The outline of the church can be seen bottom centre of image. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Figure 41 The main area of earthworks relating to Cranwich medieval settlement, as visible in 1946. Photograph RAF/3G/TUD/UK/101 RV 6132 30-MAR-1946 Historic England Archive (RAF Photography; detail).

One of the densest areas of medieval settlement remains recorded in Block 4 is located around the small village of Cranwich (NHER 63072 and 1039). Of the recorded features, the most coherent group lies to the east of the church. It comprises a range of possible property boundaries, enclosures, field boundaries and drainage ditches. There are further enclosures and ditch features to the west and north of the church, along with levelled ridge and furrow and trackways. Across the site, the trackways are predominantly causewayed, consisting of a bank flanked by a ditch on each side. There are two areas of previously recorded trackways (NHER 23839 and 35520) to the north of Cranwich which appear to be contemporary and have been incorporated within the mapping for this site. The medieval settlement remains can be seen as earthworks on 1940s aerial photographs, but most of the site had been levelled by the 1970s. An area of earthworks appears to still survive to the north of the church, and is visible on the visualised EA lidar data. These earthworks may relate to former hollow ways and boundaries, as well as two ditches and a bank forming a roughly oval-shaped feature. As discussed above (in the section on Anglo-Saxon sites), this possible oval shaped feature may relate to an enclosure, with Anglo-Saxon origins, or may be the result of a possible hollow way and boundary ditch in close proximity to each other coincidentally forming a roughly oval shape. The site has been extensively metal-detected, and also field walked (NHER 1039). Large numbers of finds of various dates – including prehistoric, Roman, Anglo-Saxon, medieval and post-medieval – have been recorded across the site (NHER

28315, 25525, 34480, 13696). Given this, it is possible that some features, like the roughly oval shaped ditches, may be Anglo-Saxon or earlier in date. It is also likely that some of the drainage ditches date to the post-medieval period.

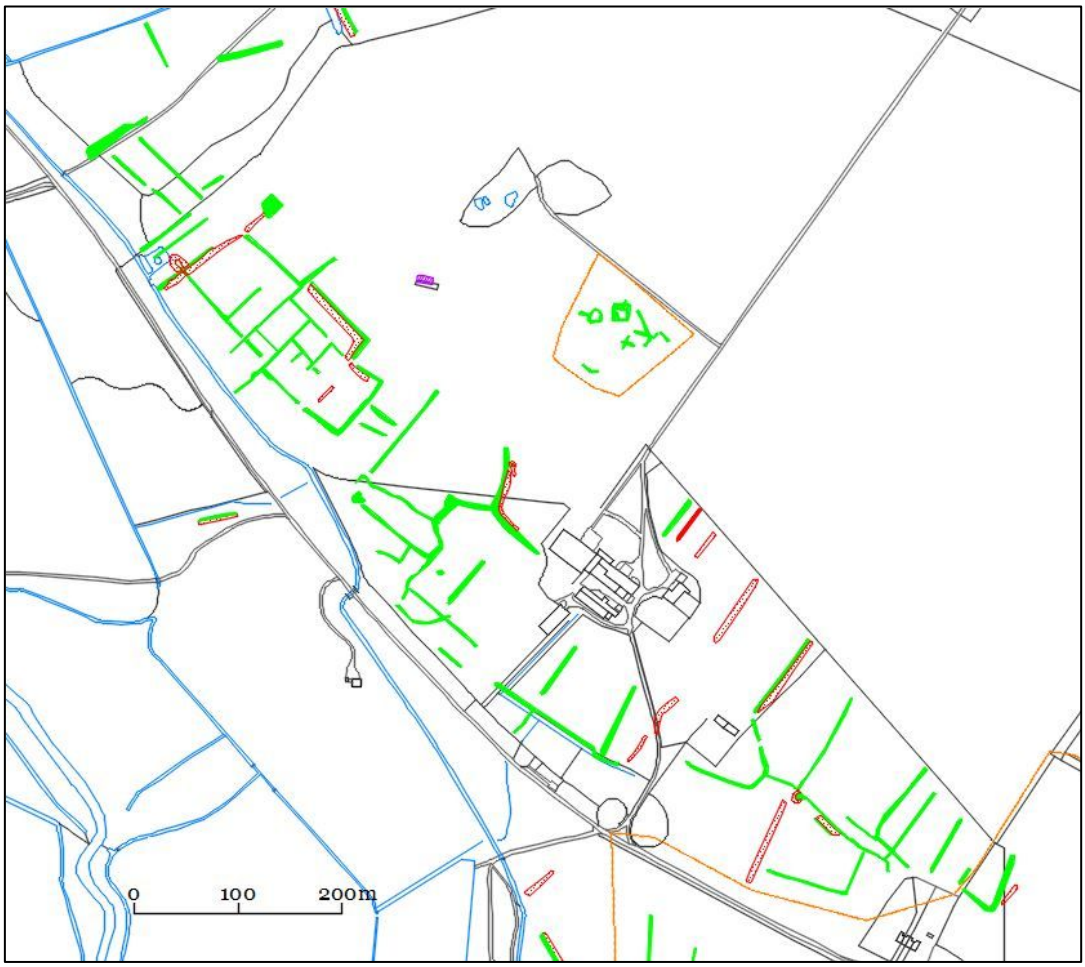

Figure 42 The medieval settlement remains recorded at Colveston (NHER 63236 and 1040); banks are shown in red, ditches in green. The foundations of St Mary's Church are depicted in purple towards the top centre of the image. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

The site of Colveston medieval village is situated approximately 850m to the north-east of Cranwich (NHER 63236 and 1040). Unlike Cranwich, there is no modern settlement at the site. By 1738, only a manor house and an adjoining farmhouse were apparently still standing (NHER 1040). St Mary's Church is recorded as being in ruins by the 17th century; its foundations are still evident as structural remains today, albeit overgrown (NHER 1040). The majority of the mapped features probably relate to land division, field systems, property boundaries, drainage and enclosures. The latter include a large enclosure (located in the west of the site) with two possible entrances. The features were visible as earthworks on the 1940s aerial photographs, but most of the site had

been levelled by the 1970s. Some of the surviving ditches have remained in use as drainage ditches, and are visible on visualised lidar data.

Further, less extensive areas of settlement remains were also recorded in Block 4, situated to the south of Foulden (NHER 62497), to the south of Ickburgh (NHER 63240) and at Mundford (NHER 63329). In these cases, and in the case of the manorial sites at Northwold, for example (*see below*), it needs to be borne in mind that the limited extent of the features visible on the aerial sources reflects the continued existence of a settlement on what would have been the historic core.

At Foulden, the possible settlement remains consist predominantly of ditches, most probably related to medieval boundaries and drainage features (NHER 62497). It is possible that some relate to post-medieval drainage. The features lie in close proximity to two areas of possible ridge and furrow (NHER 62495 and 62496), perhaps supporting their suggested medieval date.

Figure 43 The medieval settlement remains recorded at Ickburgh (NHER 63240); ditches are shown in green. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

To the south of Ickburgh, a series of cropmark ditches were mapped, again probably relating to medieval settlement (NHER 63240). They are visible as cropmarks on historical aerial photographs, and probably represent former boundaries, possible property boundaries, field boundaries and drainage. A large irregular ditch has been mapped in the west of the site, which may relate

to a former watercourse or a post-medieval drain. The features are in close proximity to find spots (NHER 59860), where medieval and post-medieval finds have been recovered.

Possible medieval banks and ditches (NHER 63329) were also mapped in the vicinity of Mundford. They probably relate to property boundaries, boundary banks and ditches, trackways and drainage. Some features may also relate to post-medieval boundaries and drainage mapped on the Tithe Map and historical Ordnance Survey maps. The features can be seen as earthworks on 1940s aerial photographs, with most features having been levelled by the 1970s. Approximately 500m to the north is an area of possible medieval strip fields and ridge and furrow (NHER 63239).

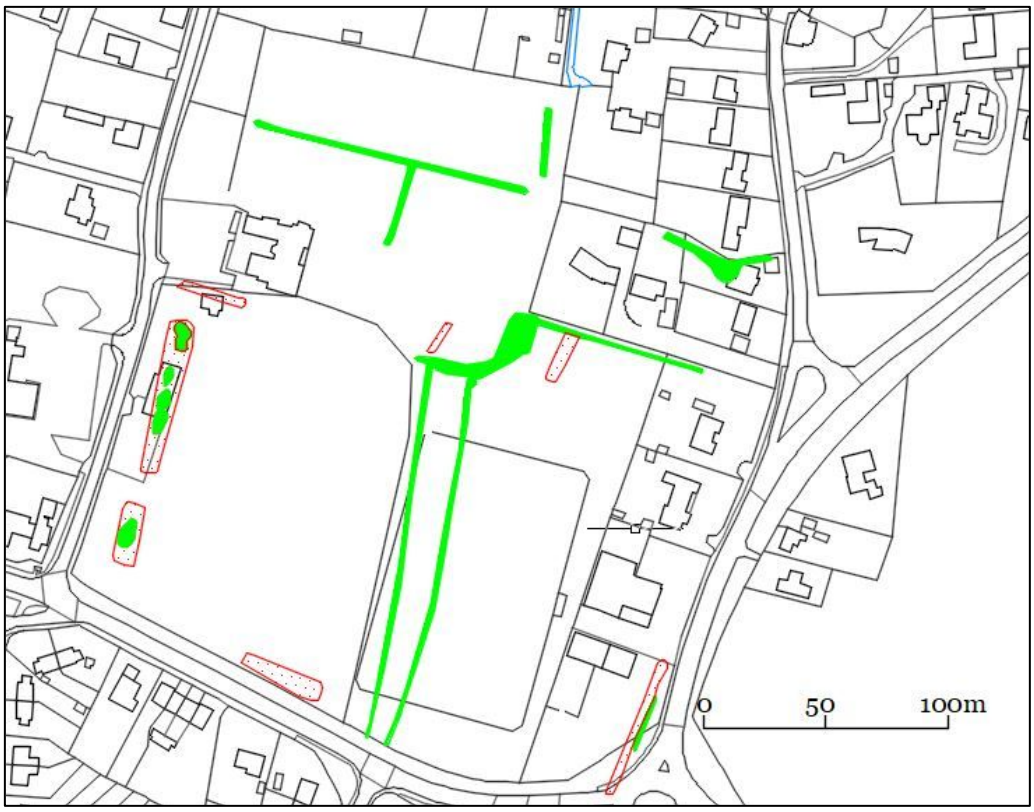

Figure 44 Part of the medieval settlement remains recorded at Mundford (NHER 63329); banks are depicted as red, ditches as green. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

Prior to the AIM survey, medieval settlement remains had also been recorded in the vicinity of both Didlington Hall (NHER 63055 and 11758) and Lynford Hall (NHER 30470 and 5145), primarily from documentary evidence. While the AIM survey recorded features in close proximity to these records, it is not clear whether they relate to the documented medieval settlements, or are instead post-medieval and/or modern features. At Didlington Hall, for example, the

survey recorded a rectilinear arrangement of broad banks and ditches (part of NHER 63055), which could represent former medieval land division and drainage. Equally, they could instead have been associated with post-medieval tree planting in the parkland around Didlington Hall (NHER 40234 and 4821). At Lynford Hall, the earthworks located to the south of the current hall (NHER 30470) may relate to the documented medieval village (NHER 5145), but are perhaps more likely to relate to former garden features, and/or the sites of two earlier halls.

Other Forms of Settlement

In addition to the extensive areas of medieval settlement remains discussed above, a number of possible high status medieval and/or early post-medieval settlement sites were recorded. They include possible manorial sites and moats. Most were located in Block 4.

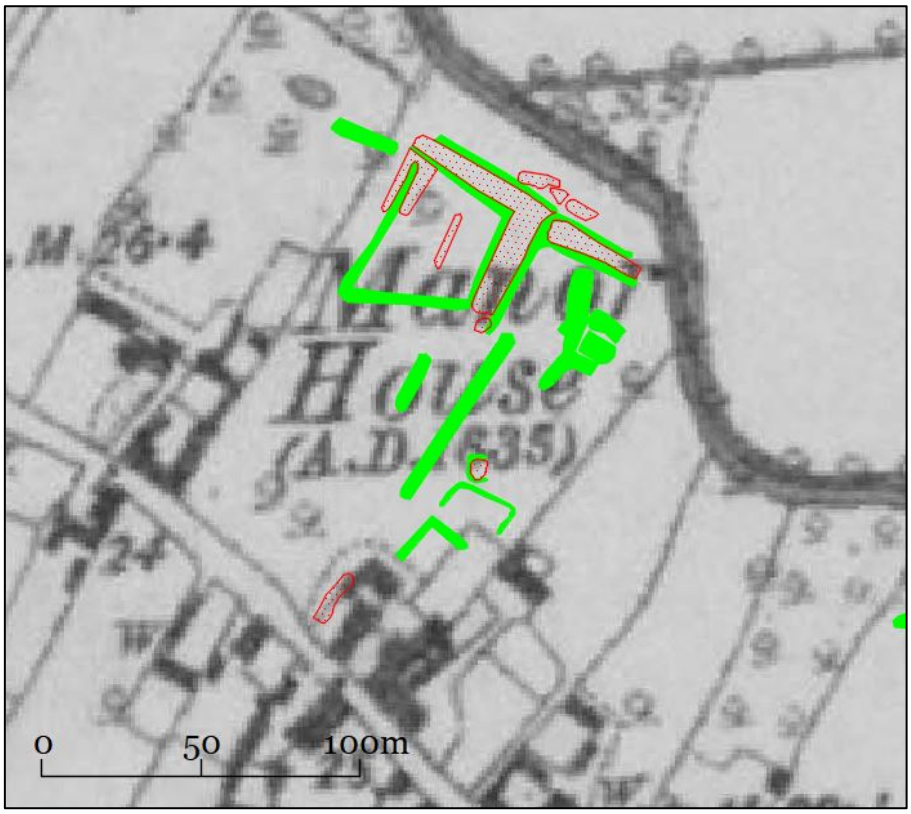

Figure 45 The manorial site in Northwold village (NHER 32253); banks shown in red; ditches, pits and depressions in green. Base map Ordnance Survey 1st edition 6 inch map supplied by NCC.

A possible manorial site in the centre of Northwold had been recorded prior to the survey (NHER 32253). The mapping at the site revealed a complex arrangement of embanked and ditched enclosures, trackways and possible

former structures. The site is marked as 'Manor House (AD 1635)' on the late 19th-century Ordnance Survey 1st edition 6 inch map, and as 'Manor Farm (AD 1635)' on the early 20th-century Ordnance Survey 2nd edition 25 inch map. The earthworks in the south of the site may be associated with former boundaries depicted on the Tithe Map and historical Ordnance Survey maps. The features are visible as earthworks on 1940s aerial photographs, but were presumably levelled when the site was built over.

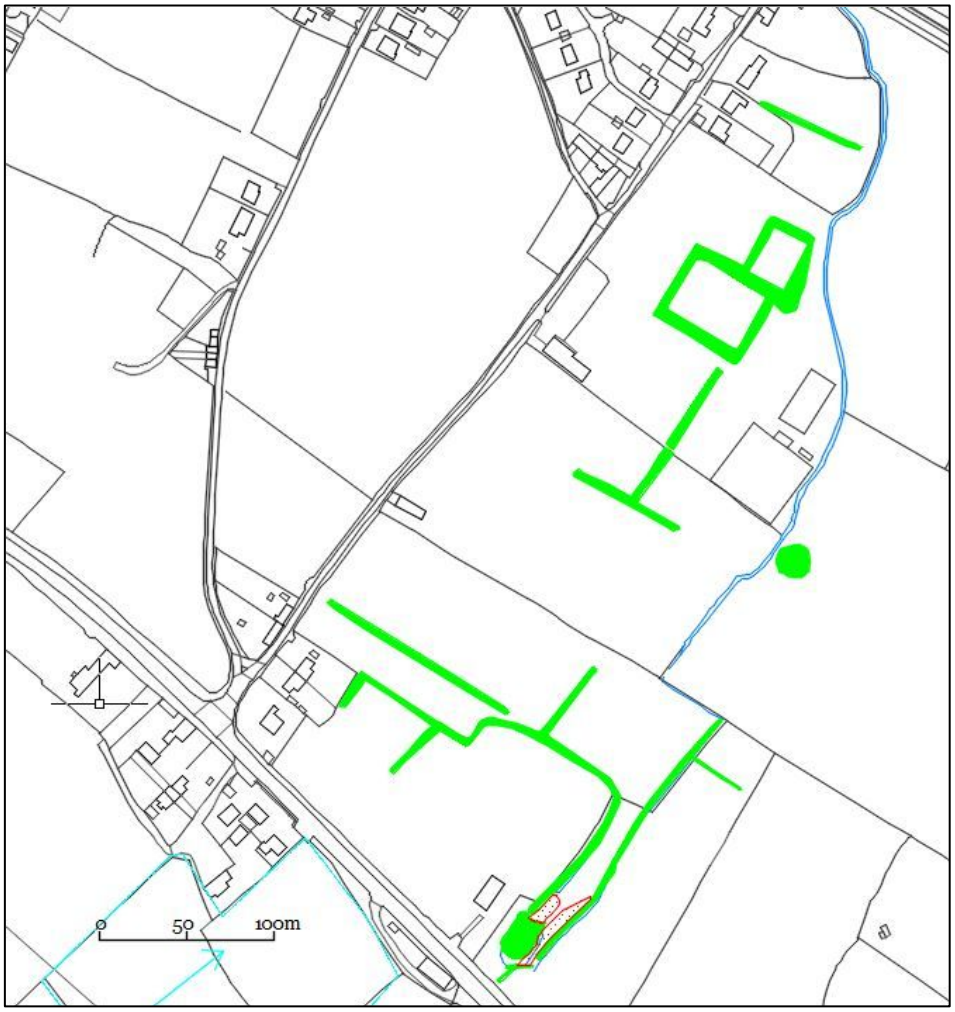

Figure 46 The moated site of 'Hovells Manor' (NHER 4831; top right*) and surrounding features; banks are depicted as red, ditches as green, extent and direction of ridge and furrow in turquoise. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.*

A further possible manorial site (NHER 4831) was recorded approximately 900m to the south-east of the site just described, beyond the eastern end of Northwold village. The site consists of two, conjoined, medieval to post-medieval moats, with further ditches and possible ponds to the south. The features probably relate to a manor recorded as 'Hovells Manor' on historical

Ordnance Survey maps. The site is visible as earthworks on 1940s aerial photographs, but most of the earthworks were levelled in the 1970s.

Again in Block 4, a previously recorded moat was mapped by the survey to the east of Mundford (NHER 31916). The earthwork ditches of the possible moat can be seen on visualised BNG lidar, with the northern ditch possibly re-used as a post-medieval drain recorded on historical maps. Within the moated enclosure a possible internal bank and raised square area are visible; these features were not mapped, as they appear very faintly on the visualised lidar data and it is uncertain whether the features are archaeological or natural in origin. The Tithe Map shows a building within the moat; previous work has identified it was in use as a parsonage at that date (NHER 31916).

In Block 3, the survey mapped part of a possible moat in Culford Park, in the south-east corner of the mapping block (SHER CUL 034). The moat had been recorded previously, as it is depicted on 18th-century estate maps. It has been suggested as possibly being the site of the original Culford Hall, which must pre-date 1591, when building on the present site started. The AIM survey mapped what may be the northern arm of the moat, which is visible as an earthwork on the visualised EA lidar data.

Agricultural Features

The survey recorded multiple features relating to medieval agriculture. Some were recorded as part of the medieval settlement sites, but several more isolated areas of strip fields and ridge and furrow were recorded in the wider landscape. In Block 3, these include an extensive area comprising blocks of ridge and furrow bounded by banks (SHER CUL 079) within Culford Park. While some of the banks may be later features, the site probably represents a fragment of the pre-park landscape. Much of the ridge and furrow remains visible as earthworks on visualised EA lidar data. In Block 4, earthwork and levelled ridge and furrow was mapped to the north and south of Northwold (NHER 62485, 62486 and 63062). At the southern site, the ridge and furrow appears to be overlain by a group of enclosures of probable medieval date (NHER 35568). An extensive, but more dislocated and less coherent area of probable field boundaries and ridge and furrow was also recorded to the north of Mundford (NHER 63329 and 63237).

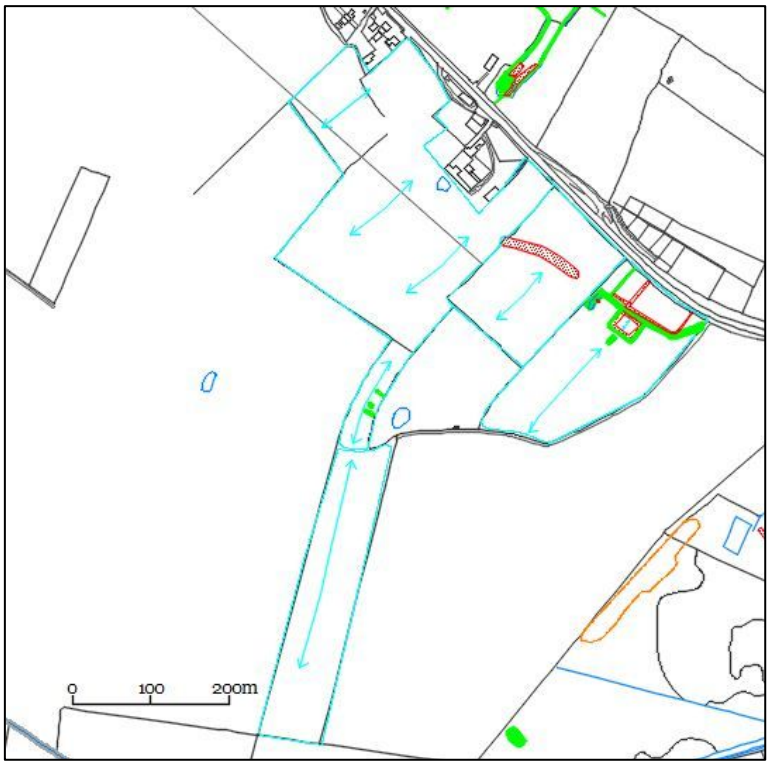

Figure 47 The ridge and furrow and enclosure group recorded to the south of Northwold (NHER 63062 and 35568); banks depicted as red, ditches as green, extent and direction of ridge and furrow in turquoise. Base mapping derived from Ordnance Survey MasterMap © Crown copyright and database rights 2020 Ordnance Survey 100019340.

General Observations

There are a number of similarities between the areas of medieval settlement recorded in Blocks 3 and 4. In terms of survival, the majority of the sites were seen as earthworks on 1940s aerial photographs, but had been levelled by the 1970s, with evidence for surviving earthworks being relatively scarce. This is a fairly common pattern, both within the region and nationally, with post-Second World War agricultural regimes leading to the levelling of a wide variety of earthwork sites. As discussed above, however, Breckland has still been unusual – at least in the experience of the mapping team – for the number and density of medieval settlement sites visible on the aerial sources, whether as earthworks, cropmarks or soilmarks.

A significant proportion of the medieval settlement remains mapped by the project lay close to areas of modern settlement; for example Lackford, Flempton, and Wordwell. As such, much of the evidence recorded by the project is arguably for shrunken or shifted settlement. Even at Cranwich, one of the more extensive sites recorded by the project, the church and a small village still

exist. At a more limited number of sites there was evidence of settlement having been more or less completely abandoned, as with the isolated settlement remains mapped to the south of Foulden (NHER 62497) and at Colveston (NHER 63236), although even at the latter a farm still exists.

In terms of their layout and character, although the settlement sites have common features such as enclosures and possible property boundaries, the alignment and the layout of the sites varies considerably. Some sites, such as Wordwell and Cranwich are spread out, compared with sites such as Lackford which are more compact. This will to some extent reflect the original layout, density and volatility (for example, in terms of property boundaries being re-worked and altered) of a particular settlement, but also what proportion and area of the historic settlement is visible on the aerial sources, compared to those areas that are still occupied by modern settlement or otherwise not visible. It is also notable that relatively few building platforms were identified, with only one or two mapped at Lackford and Flempton.

In terms of their location, it is clear that the majority of sites are very low lying, and in some cases situated in very close proximity to a watercourse, for example at Flempton (FMP 040; Block 3) and Cranwich (NHER 63072; Block 4). This is likely to be a response to the dryness of the Breckland climate, and the need for settlements to be located with optimal access to water. They are also located in relatively close proximity to each other, with sites such as Cranwich and Colveston (NHER 63072 and 63236; Block 4) situated only 700m apart. In Block 3, the villages of West Stow and Flempton, on opposite banks of the River Lark, are only 1km part, while the settlement remains mapped at Lackford (SHER LKD 025) and Flempton (SHER FMP 040) are approximately 2km apart. This density is almost certainly a reflection of the relatively constricted area available for settlement within the river valleys, given the need for access to water. As has been discussed above, this density of sites, and their low-lying position within the river valleys, is a pattern that was evident not only in the Stage 2 mapping, but also that from Stage 1 of the Breckland AIM project, and the earlier NMP project covering the environs of Thetford.

It is not just the wealth of evidence for medieval settlement that is of importance in Breckland. As was clear from Stage 1 of the project, and in particular the earlier NMP project covering Thetford, it is the fact that other elements of the landscape – roads and trackways, isolated heathland enclosures, warren boundaries and enclosures – have also been an important feature of the mapping. This enables a more coherent picture of the medieval landscape to be built up. Further investigation is now required; the need to integrate AIM mapping with other datasets was recognised by the Norwich-Thetford-A11 NMP Project (Cattermole *et al* 2013, 56). The use of documents and maps relating to heathland and former roads and tracks, for example, would allow the medieval (and post-medieval) landscape to be explored more fully, and in finer

detail, thereby maximising the returns from the AIM results. While some individual elements of the landscape may be relatively well understood in isolation, there is still a need to 'articulate' this landscape, to reach a better understanding of how settlement and economy functioned. If the river valleys were relatively densely settled in the medieval period, while much of the uplands were in use as warrens, where did the inhabitants of Breckland grow their crops or graze their livestock? How were rights to different resources managed, and how did this change over time? What physical traces of these processes are still evident in the landscape?

It is hoped that ongoing work by local researchers, such as the Friends of Thetford Forest, will enable the results of the Breckland AIM project to be used to help answer these questions. On the specific questions relating to settlement, Professor Tom Williamson from the University of East Anglia has been successful in securing funding for an AHRC CHASE-funded studentship through the Collaborative Doctoral Award competition (https://www.chase.ac.uk/cda). The PhD project will focus on changing patterns of settlement and land use in the East Anglian Breckland, and the extent these can be associated with climatic change. The use of AIM data will be an essential component of the research, with the successful candidate working closely with the Air Photo Interpretation Team to fully characterise and analyse the data.

RESEARCH THEME: 20TH-CENTURY MILITARY TRAINING

Breckland's 'emptiness' – its large landed estates and vast tracts of what was perceived to be unproductive land, combined with its low population density – made it a favoured location for military training throughout the 20th century. Sites relating to military training were a major feature of the Stage 2 mapping. They are also one where further research, investigation and synthesis with other sources would be of considerable value.

The importance of Breckland for military training has continued into the present day, with STANTA (Stanford Training Area) still in active use. Established during the Second World War, it occupies a substantial area of north-east Breckland, bordering the eastern edge of Block 4. While no features relating to STANTA itself were recorded by Stage 2 of the project, its existence may have affected the location and distribution of other recorded sites, for example the cluster of Second World War camps recorded in Block 4.

A significant issue encountered during both stages of the Breckland AIM survey has been that of very extensive sites. While not confined to military training areas, or 20th-century military sites in general, they are certainly a category of site where it is a particular problem. Such sites tend to be not only very extensive, but also poorly defined. It is often difficult, using the aerial sources, to be certain where a training area (or area of military activity) starts or finishes, given that such sites are often represented by an irregular patchwork of vehicle tracks, groups of pits, and clusters of huts or installations, spread unevenly across the landscape, with no defining feature to unite or enclose them. Often the mapping defines such sites on the basis of a relative presence or absence of visible features, rather than a clear boundary.

For the project, the extensive nature of such sites meant that they could not always be mapped in their entirety. While it is usual to map the whole of sites that fall partially outside the project area, some of the military sites encountered by the project were so extensive that it was simply not feasible to do this. It would have meant mapping areas significantly beyond the limits of the project area, without the benefit of all the sources. This issue could perhaps be avoided by taking the existence of such sites into account at the project development stage, and selecting a project area that did not cut across large sites. However, this can only be done on the basis of what is already recorded, and the experience in Breckland has been that the full extent of such sites is rarely recorded by HERs prior to an AIM survey (or equivalent work) taking place.

Lynford/Mundford, Norfolk

A series of unusual trenches, presumed to relate to 20th-century military activity, were mapped in Block 4. They lie to the west of Lynford village, along the Lynford/Mundford parish boundary, but also in more isolated locations in Mundford parish. There is a further example in Weeting-with-Broomhill, and another possible example in Methwold. The trenches are all principally visible as surviving earthworks on the 2015 BNG lidar. A number of those on the Lynford/Mundford parish boundary had been identified by an earlier field survey, and interpreted as probable Second World War slit trenches (NHER 57837). They comprise narrow, seemingly steep-sided trenches, each arranged in an irregular curvilinear circuit. Their interiors, which in the smallest example measures only 6m across, and in the largest measures 56m across, show no evidence of internal features, although poorly defined banks – presumably produced by the up-cast spoil from the trench – are sometimes visible.

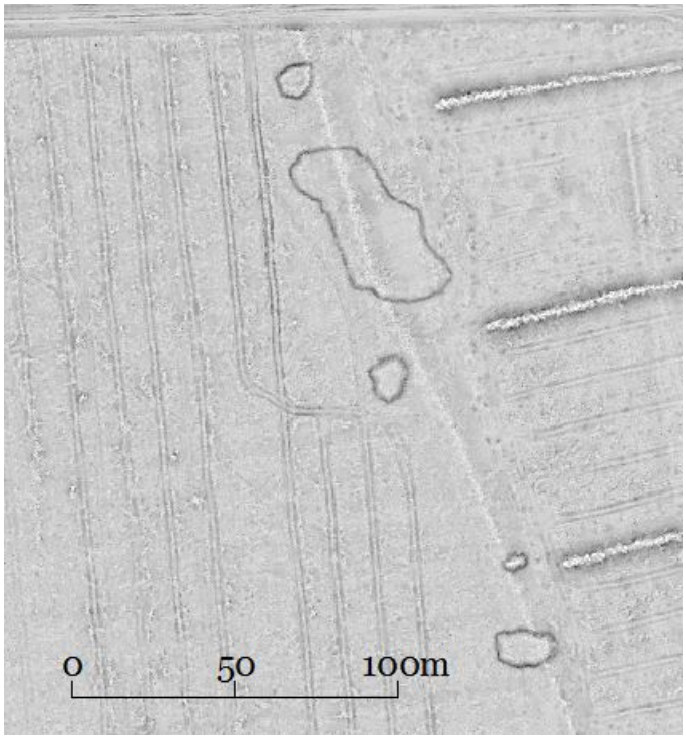

Figure 48 'Positive openness' lidar imagery of irregular curvilinear trench circuits of probable 20th-century military origin west of Lynford village (NHER 57837). Several of the trenches cut into a post-medieval boundary bank that follows the line of the parish boundary. Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England

The purpose and date of the trenches is not known. They do not conform to the usual crenelated or zig-zag pattern typical of First and Second World War

trenches. Nor is there any evidence that they formed part of a comprehensive system of front line, support and communication trenches, as seen at other sites in Breckland and elsewhere (Brown 2017; Horlock and Tremlett 2018, 53, fig 24). They are almost entirely under forest cover on the 1940s aerial photographs, and assuming they were not excavated amongst established trees, a date substantially earlier than the mid-1940s seems most plausible. Part of one trench circuit (NHER 63337), at what is now Grimes Graves Cottage, is visible free of tree cover on the 1940s aerial photographs, but it does not look like a particularly fresh earthwork.

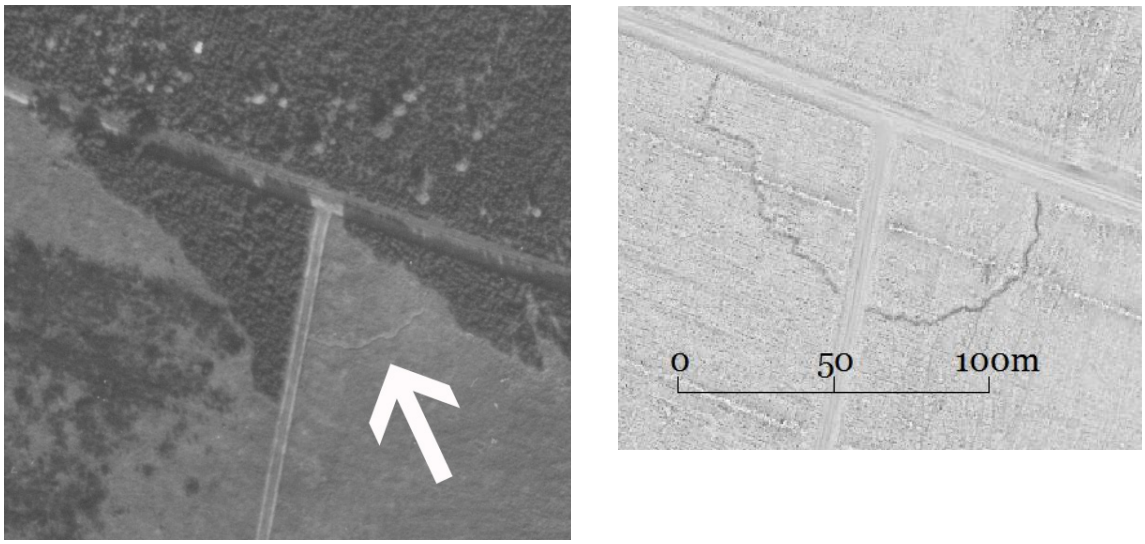

Figure 49 An open curvilinear trench of probable 20th-century military origin (NHER 63258) at Weeting-with-Broomhill, visible on a 1946 aerial photograph and 'positive openness' lidar imagery. It is clear that it continued into the woodland present in 1946, suggesting that it is of pre-Second World War date. Photograph RAF/CPE/UK/1801 RS 4118 25-OCT-1946 Historic England Archive (RAF Photography; detail). Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England.

Additional fragmentary circuits are visible 620m to the west (NHER 63338), within what is probably a post-medieval enclosure (NHER 61508). Two open curvilinear circuits, which are otherwise very similar in character, are visible even further (1.6km) to the west (NHER 62024 and 63258). These are also partially visible on 1940s aerial photographs but do not look as though they had been freshly dug. To their north, visible only on the lidar, is a more extensive irregular linear trench (NHER 63339). This looks closer in appearance to a First or Second World War trench, but still appears rather irregular and unsystematic.

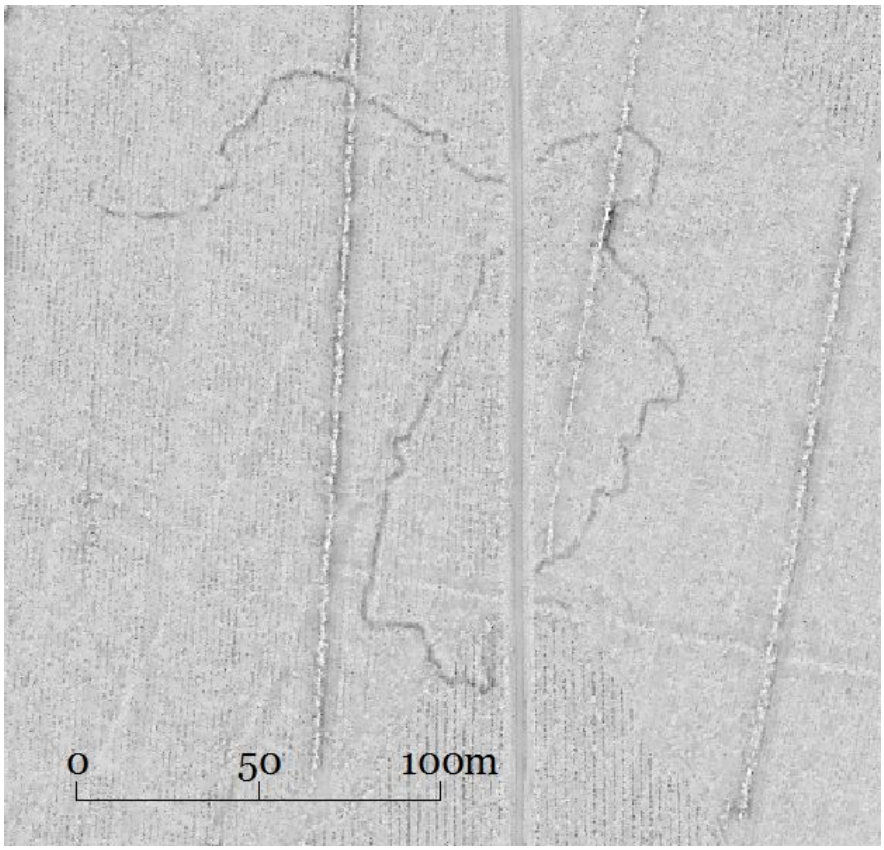

Figure 50 'Positive openness' lidar imagery of an irregular linear trench of probable 20th-century military origin in Mundford (NHER 63339). It cuts across a number of post-medieval boundary banks. Lidar © Crown Copyright. Forest Research. Based upon BNG LPS Project, FC England and Fugro Geospatial Data. Supported by the Heritage Lottery Fund. Visualisation created by Historic England.

It is possible that some or all of these trenches were excavated within an open or forested environment during (or between) the First and/or Second World Wars. Had they been excavated amongst trees, this might to some extent explain their irregular pattern. However, another possibility is that they relate to military training that took place prior to the First World War. Their unconventional plan-form could indicate that they pre-date the 1908 *Manual of Field Fortifications*, or at least its widespread implementation (*see* Brown 2017). Their construction might have formed part of the territorial manoeuvres that took place in Breckland in 1906, 1911 and 1912, the latter on an extremely large scale (Breckland Society 2016, 9–12). Further documentary research might reveal useful information about these sites, while site visits would be beneficial to better assess their condition and character, particularly for those sites that were not previously recorded.

Berner's Heath, Suffolk

One of the densest areas of military training in Block 3 was on Berner's Heath in the north-west of the block. The heath was used for extensive First World War tank training (SHER IKL 352 and WSW 101) as part of the 'Elveden Explosives Area', where some of the first tanks were deployed for training and testing. The tank training area was created with realistic trench layouts similar to German defences. Trenches were designed to include a network of forward trenches, machine gun posts, zig-zag communication trenches, weapons pits and dug outs (The Breckland Society 2016, 20). Elements of the practice trenches can be seen clearly on the historical aerial photographs, with three main clusters of trenches visible in the centre of the heath, and a further cluster along the northern edge. Additional, less well-preserved trenches can be seen as vegetation marks to the east of the three main clusters. Some of the possible communication trenches can also be seen as earthworks on the visualised lidar data in the centre of the heath as well as further to the east (SHER WSW 150).

Figure 51 Berner's Heath bombing range, visible on a 1950s aerial photograph. The remains of probable First World War practice trenches associated with tank training at 'Elveden Explosives Area' can be seen crossing the area from top right to centre. Photograph RAF/58/2688 F22 0054 25-JAN-1959 Historic England Archive (RAF Photography; detail).

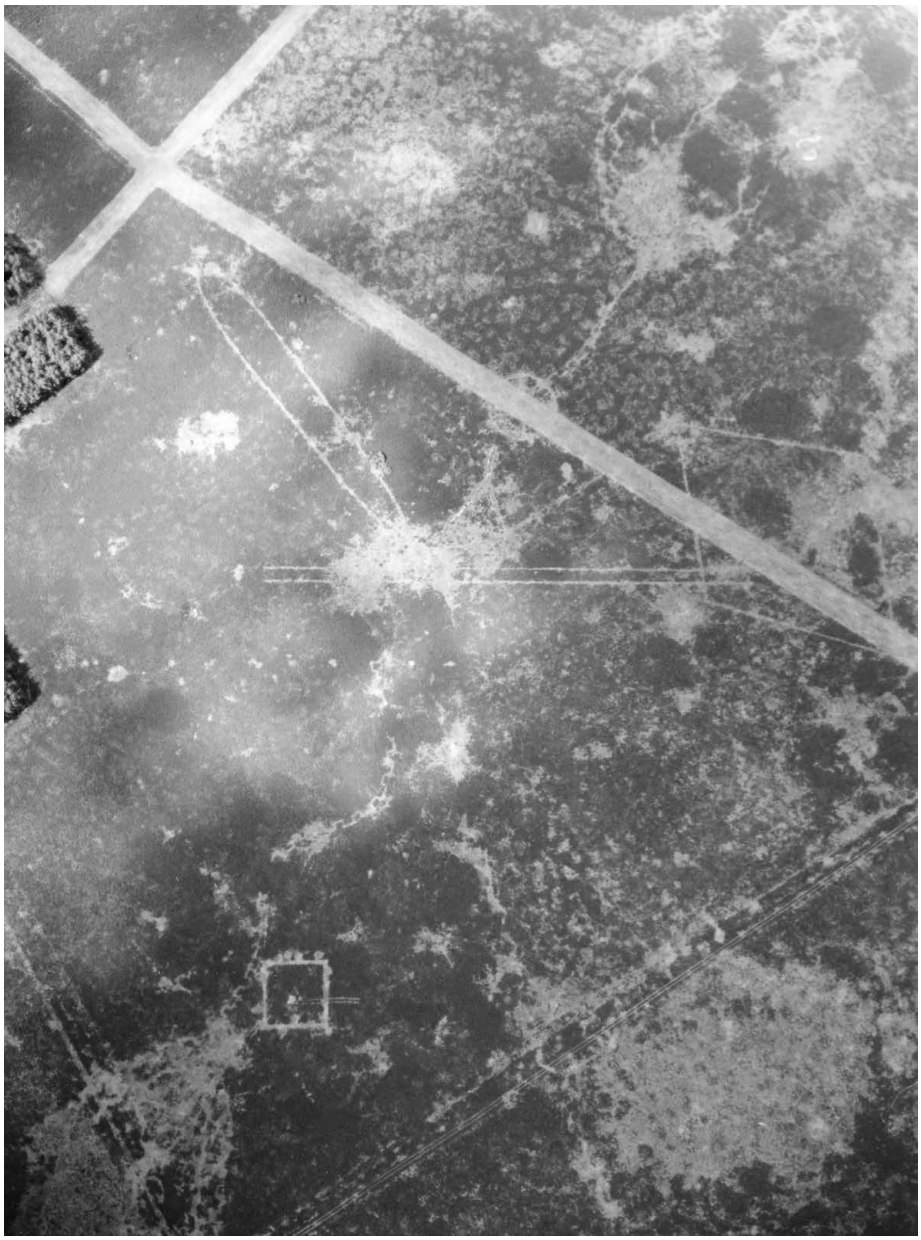

Figure 52 The bombing range targets on Berner's Heath. The possible ship target can be seen above and left of centre; the diamond, square, circle and linear target are also clearly visible. Some of the probable First World War practice trenches can also be seen. Photograph NLA 13351/8 25-JUL-1991 (S-B8) © Norfolk County Council (detail).

Berner's Heath was later used as a Second World War to Cold War bombing range (SHER IKL 107 and IKL 353). Across the heath, a large number of explosive craters can be seen on the 1940s and 1950s aerial photographs. Some form dense clusters, most likely from practice bombing runs. A number of practice targets can be seen in the 1940s, including a possible ship target, a large diamond-shaped target, a smaller square target with a triangle in the centre, a very narrow linear target and a circular target. During the 1950s a

triangular arrow target was added. The targets are clustered together, and overlay some of the First World War practice trenches, which can be seen clearly alongside the targets. To the east of the targets, a directional arrow and possible buildings can be seen on the 1940s aerial photographs. In the 1950s, further buildings, a new directional arrow, a possible tower and a large set of 'BH' letters (most likely standing for Berner's Heath) were added. A tower can be seen in the north of the site which may have been an observation tower. Other features relating to the bombing range included ditch features in close proximity to the control buildings, a large embanked triangular pit, a possible small rifle range or more likely a blast wall/shield, a large number of vehicle tracks across the area, trackways and a brick wall used for target practice (SHER IKL 123). The site was no longer in use by the late 1950s, but some of the targets and a large number of the explosive craters can be seen on recent aerial photographs and the BNG lidar data.

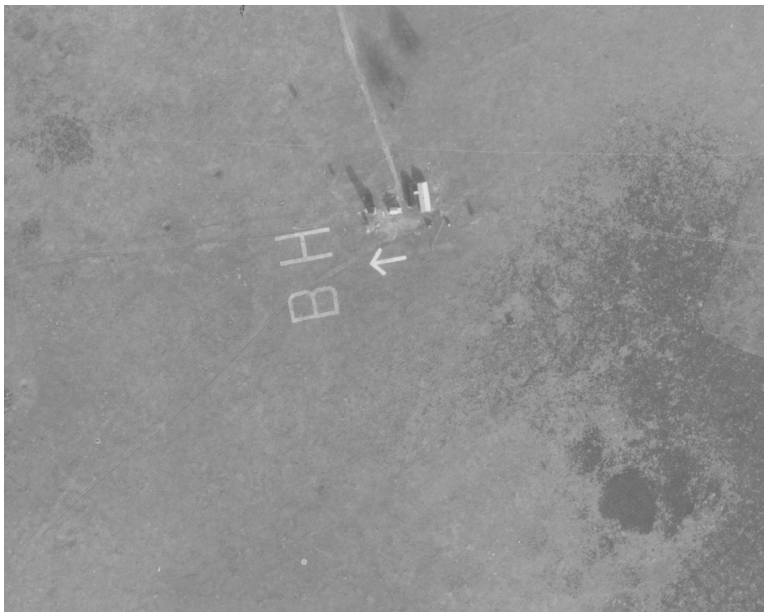

Figure 53 The possible control tower, directional arrow and 'BH' letters visible at Berner's Heath on 1950s aerial photographs. Photograph RAF/82/1079 F21 0027 08-FEB-1955 Historic England Archive (RAF Photography; detail).

To the south of the bombing range (SHER IKL 353) in the west of Block 3, further explosive craters (SHER IKL 365) have been mapped. It is possible that these were craters from bombs dropped outside of the bombing range.

Area South of Elveden, Suffolk

Across the north-east portion of Block 3, a range of features were visible that are presumed to be Second World War military training features. They were not necessarily related to each other – they may have been constructed and used by

different groups and at different times – but they are grouped together here due to their general proximity, location and character. Further historic research would be beneficial to establish the purpose of many of the features, and who created them.

In the north-east of Block 3, a range of probably Second World War military training features (SHER ELV 196) can be seen to the south of Elveden Hall. These consist of multiple areas of pits and banks which may have related to former weapons pits, trackways used for vehicle training, vehicle tracks, practice trenches and explosive craters. Circular features are also visible that possibly relate to former emplacements, for example for searchlights. Multiple banks and a large mound with a ditch (SHER ELV 185) have also been recorded in this area. These too may be Second World War military training features, including a possible rifle butt. However, it is also possible that these features, including the suggested rifle butt, may be post-medieval or modern park or garden features associated with Elveden Hall (SHER ELV 009) to the north.

Areas of probable Second World War practice trenches have also been recorded in the north-east of Block 3 (SHER BNH 128, BNH 132 and BNH 172). The features consist of a range of different types of trenches, which vary in length, width and alignment. Some of the trenches have related banks which may have been a defensive feature, or simply spoil from their construction. Some of the trenches are in close proximity to a number of small possible weapons pits. The areas of practice trenches are in close proximity to each other, with two areas (SHER BNH 128 and BNH 172) approximately 400m from each other, and both approximately 750m south of SHER BNH 132.

Four large depressions surrounded by roughly V-shaped banks and a further smaller embanked depression (SHER WSW 146) are also recorded in the north-east of Block 3. The pits again are most likely to be Second World War military training features; they are visible on the 2015 BNG visualised lidar data, and probably still survive as earthworks. The four embanked depressions are similar in form to other embanked pits mapped as part of SHER BNH 353 approximately 1.5km to the west, SHER BNH 127 approximately 1.2km to the north-east and as part of NHER 63082 in the centre of Block 4. Further banks, embanked pits and ditches (SHER BNH 127 and BNH 130) are also evident in the north-east of the block in close proximity to the practice trenches (SHER BNH 128) and cluster of embanked pits (SHER WSW 146).

Pit Features

Groups of pits and circular embanked pits (SHER CUL 080, CUL 083, IKL 366, WSW 203, WRW 092, WSW 209 and WSW 217) can be seen across Block 3. The majority of the embanked pits most likely relate to Second World War

military training, including weapons pits, possible explosive craters and possible extraction pits (for sandbags or construction material, for example). The pits and embanked pits are broadly similar in form but vary in density and size.

In the west of Block 3, five pits with surrounding banks are visible as earthworks on historical aerial photographs and visualised lidar data. Four of the features consist of an elongated pit surrounded by a large bank, with the fifth feature consisting of two roughly circular pits surrounded by a bank. This group of embanked pits is in close proximity to further embanked pits to the east (SHER WRW 093) and south-west (SHER WRW 074). The function of the pits is unknown, and they are much larger than the pits discussed above. They appear, however, to have been recently in use on the 1940s aerial photographs, and it is likely that they too are Second World War military training features. It is also possible that the embanked pits may relate to the Second World War activity at Culford Camp, approximately 1.5km to the south (SHER WRW 032). The camp was occupied by the Women's Land Army, and housed members of the Women's Timber Corps, known as 'Lumber Jills' (https://www.bbc.co.uk/history/ww2peopleswar/stories/32/a6664232.shtml). The majority of the embanked pits (aside from SHER WRW 093 and one of the pits recorded as part of SHER WRW 074) can be seen as earthworks on the 2015 visualised lidar data.

Further elongated pits (SHER WRW 094 and CUL 074) possibly relating to military training have also been recorded in the west of Block 3, along with a possible Second World War hut (WRW 095).

In the south-east of Block 3, a series of possible explosive craters, practice trenches, pits, possible extraction and trackways have been recorded (SHER IKL 372). The Second World War training features are situated within a large pit, originally the product of post-medieval extraction and recorded as 'Town Pit' on the 1st edition 6 inch Ordnance Survey map. The post-medieval pit remains visible on the visualised lidar data whilst the majority of the possible Second World War features appear to have been levelled or removed.

High Ash, Norfolk

High Ash Camp (NHER 34074) was one of the largest military training camps recorded in Block 4. The camp was most likely constructed between 1940 and 1942 and was used by several army divisions, most notably the Seventh Armoured Division (the 'Desert Rats'; The Breckland Society 2016, 35). The Seventh Armoured division used High Ash as their only training site in Britain whilst training for the D-Day landings (ibid 35; Grover and Grover 2017, 10). It has been suggested that up to 14,000 troops would have been stationed at the site during the lifetime of the camp (Grover and Grover 2017, 10). The site

presently has a Second World War 'Cromwell' tank on a plinth near the road as a war memorial.

*Figure 54 High Ash Camp in 1946; huts are visible lining the roads, but also amongst the trees. The detailed image (*right*) shows the wedge-shaped ramp. Photograph RAF/3G/TUD/UK/101 RV 6061 30-MAR-1946 Historic England Archive (RAF Photography; detail).*

The site contained a large number of huts, most of which are visible as structures in the 1940s before being removed by the 1950s. A large proportion of the huts can be seen situated between areas of woodland on the 1940s aerial photographs. They would probably have been used for a variety of purposes such as accommodation and support structures (for examples cookhouses; Clarke 2017, 46). The huts were probably situated in the woodland to remain hidden from aerial reconnaissance (ibid 46). Some of the earthwork banks surrounding the huts in the north and south of the site can be seen clearly on the 2015 BNG visualised lidar data, underneath the woodland canopy. On the 1940s aerial photographs, larger huts can be seen in the centre of the site and along the western perimeter road. The larger huts may have been for storage or for vehicles and maintenance. Other structures are visible, such as a possible pillbox to the south (NHER 63045), fenced features which may have related to storage or defences around former emplacements to the south-west (NHER 63043 and 63044), and a tented structure next to the huts situated on the western perimeter track in 1946. A large wedge-shaped earthwork ramp has been recorded in the centre of the area, behind one of the large huts. This feature is unusual and, as yet, no comparable features have been identified. It is therefore difficult to interpret the function of this earthwork other than relating to the military camp. Finally, sections of the Second World War hardstandings and roads still survive and can be seen on recent aerial photographs.

Further smaller areas of probable accommodation huts and vehicle tracks (NHER 62618) were visible to the west of High Ash Camp, between High Ash and Didlington Hall and Park.

Didlington Hall and Park, Norfolk

Further areas of military training can be seen between High Ash Camp and Didlington Hall to the west. Didlington Hall has been suggested to have been occupied by the Seventh Armoured division during the Second World War, as well as being used as headquarters by the British Second Army and for officer accommodation (The Breckland Society 2016, 28, 35). It has been suggested that the military occupation left the hall in disrepair, which contributed to its demolition in the 1950s (ibid 2016, 28). As at High Ash, a number of areas of huts can be seen in between the areas of woodland on the historical aerial photographs to the east (NHER 62498) and north (NHER 62499) of the hall. The huts again would have most likely been used for accommodation and support structures for the troops stationed there. The huts can be seen as structures in the 1940s, but by the 1950s they had been dismantled leaving only the hut platforms visible. The majority of the platforms were removed by the 1970s, with a few remaining as earthworks visible on the BNG visualised lidar data.

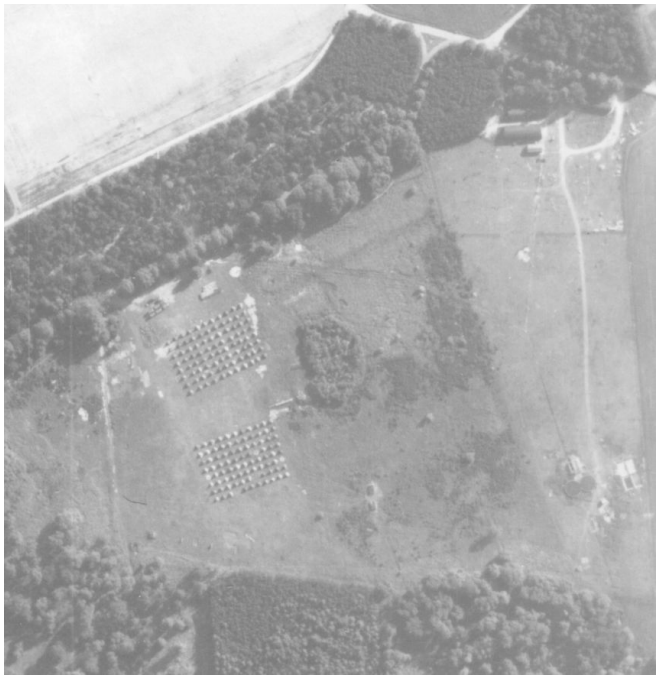

*Figure 55 The tented camp at Didlington; various support buildings and a sewage works are visible (*right*). Photograph RAF/106G/UK/369 RS 4068 08-JUN-1945 Historic England Archive (RAF Photography; detail).*

Further Second World War military activity was evident within and close to the boundary of Didlington Hall and Park to the east. This included further areas of possible accommodation huts and their platforms (NHER 62614), possible support structures for the huts including a sewage works (NHER 62613), two groups of Second World War tents arranged in rectangular formations (seen in 1945 and removed by 1946) and finally two mounds and a trench possibly relating to a rifle range for military training (NHER 62614). Second World War emplacements which most likely relate to defence rather than training are also visible within the grounds of Didlington Park; these are discussed above ('Twentieth-Century Military Sites').

Area South of High Ash, Norfolk

The training area to the south of High Ash Camp (NHER 63082) was again most likely used during the Second World War by the Seventh Armoured division, and also associated units (The Breckland Society 2016, 36; Grover and Grover 2017, 10). As with the other Block 4 areas, there were a large number of huts associated with the site. The huts would have served various functions including for accommodation, support structures and maintenance workshops (Grover and Grover 2017, 10). A sewage works was also mapped, which most likely serviced the huts to the north and is similar to a further sewage works mapped to the east of Didlington Park. A variety of earthworks were recorded from the historical aerial photographs and BNG visualised lidar data, on the heathland between the areas of huts and woodland. These included two lines of very small, roughly rectangular, staggered pits aligned approximately north–south, a cluster of triangular pits with surrounding mounds (similar to the examples discussed above in Block 3, SHER WSW 146), a second cluster of small pits with a possible practice trench, further embanked pits, possible explosive craters and vehicle tracks. These features were most likely the products of military training exercises undertaken by those stationed at the camp. It is, however, difficult to interpret the specific function of these features from the aerial photographs and lidar evidence alone. There is a number of other earthworks within the area that relate to post-medieval extraction pits (one of which may have still been active during the Second World War) and post-medieval boundary banks. The majority of the features had been levelled by the 1950s, but some of the hut platforms and embanked pits remain visible on the 2015 BNG lidar imagery.

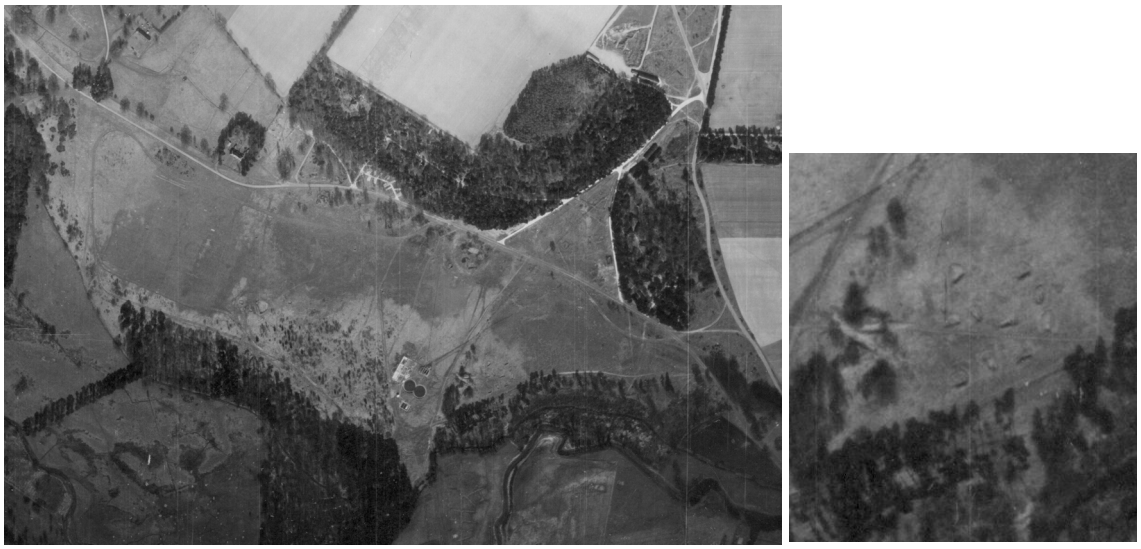

*Figure 56 The training camp south of High Ash in 1946. The detail (*right*) shows the triangular pits. Photograph RAF/3G/TUD/UK/101 RV 6131 30-MAR-1946 Historic England Archive (RAF Photography; detail).*

General Observations

There are a number of differences between the military training sites in Block 3 and those in Block 4. One of the main differences is the density of the huts evident on the aerial sources. Block 4 has a large density of huts relating to accommodation and support structures within the three main military training camps. In comparison Block 3 has very few Second World War structures, and of the structures that have been mapped, most probably relate to the bombing range rather than accommodation. The density of military training features also differs between the two blocks. In Block 4, most were mapped in and around the three main camps in the centre of the block. Although Block 3 does have a concentration of training features to the south of Elveden Hall, and across the bombing range at Berner's Heath, large numbers of pits, embanked pits (possibly relating to explosive craters and weapons pits) and practice tranches can be seen across much of the block. These variations are probably a reflection of the differing topography and land cover across the two blocks. In the 1940s, Block 3 was much more open, with larger areas of heath and a lower population destiny than Block 4. Indeed, a significant portion of Block 3 had already been used for extensive military exercises during the First World War, when it formed part of the 'Elveden Explosives Area'. In contrast, by the 1940s, Block 4 was densely forested across its southern half, while its northern half supported villages and arable fields along the Wissey Valley, providing less room for large-scale military training. The military training area of STANTA also lies immediately to the east of Block 4 – in fact the north-east corner of the block lies within its bounds. It is likely that its proximity both led to the stationing of troops in this area, and provided an area for extensive training that does not

appear to have been available within Block 4 itself. Indeed, it may have negated the need for additional extensive training areas in this part of Breckland.

CONCLUSIONS

Stage 2 of the Breckland AIM survey has added 327 new records to the Norfolk and Suffolk HERs – over 95 per cent of which relate to new discoveries – and amended a further 206 existing HER records. In addition it created an archaeological map covering 94sq km. These results represent a very significant contribution to our knowledge and understanding of the historic environment of Breckland. The increase – of 44 per cent – to the number of known sites within the project area represents a significant advance in our understanding of the archaeological landscape of northern and southern Breckland. In terms of the NRHE, the contribution has been even greater, with the results representing a massive 303 per cent increase to the record as it stood at the start of the project.

These results have made a significant contribution (41 per cent in terms of records) to the results from the project overall. The latter has resulted in a 51 per cent increase to the number of sites recorded across the area, with an average density of 6.9 sites recorded across the 190sq km covered by both stages of the project. Crucially, these sites – whether new discoveries or not – are now accurately mapped, allowing them to be better understood and better managed. This contributes directly to Historic England's strategic objective to protect historic places and keep them alive for current and future generations (*Corporate Plan 2019–22*).

Improved heritage protection, through the provision of better and more accessible information, is one of the principal outcomes of any AIM project. The incorporation of the project's results into the Norfolk and Suffolk HERs, and their availability via Heritage Gateway and (in the future) the online map being developed by Historic England's Digital Access to AI&M Data project will ensure – albeit indirectly – better heritage protection across the project area. Those charged with the management and guardianship of the historic environment, for whom HER data is a central resource, 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 sources, stored at several different locations, but readily accessible in a standardised and comprehensible format, namely HER records and maps (also accessible online via each HER's 'Heritage Explorer' website). The mapping created by the project is being provided directly to Forestry England, who own and/or manage approximately 50 per cent of the Stage 2 area, and 55 per cent of the project area overall. The fact that such a large proportion of the archaeological features recorded by the project still survive as earthworks, in particular within the forestry plantations managed by Forestry England, means that the provision of accurate mapping to land managers – and those providing them with heritage advice – is of especially vital importance.

Recommendations for Heritage Protection and Further Work

As agreed in the Updated Project Design (Tremlett 2017), a list of heritage protection recommendations – including sites for potential designation – is included as Appendix 3. This list is not exhaustive, nor is it intended to be proscriptive, but rather it includes the sites that appeared to the air photo interpreters to be the most significant, best preserved or with the greatest potential to benefit from additional work or heritage protection measures.

A list of suggested updates to the NHLE has also been compiled, and is included as Appendix 4. This lists all 10 Scheduled Monuments within the Stage 2 area, plus an additional site which falls just outside but was included in the survey. It also includes the two Registered Parks and Gardens within the Stage 2 area: Culford Park and Lynford Hall and Park. For most sites where an update is recommended, this relates to correcting the locational information for the site to correlate with the mapping resulting from the project. For most NHLE sites, the provision of updated and more accurate information regarding location and extent has been the project's most obvious contribution. However, by providing enhanced contextual information, by mapping, interpreting and recording other sites in the vicinity, the project has also improved our understanding of many of the NHLE sites in the project area.

In addition, for Stage 1, the project team compiled a list of more broad-based suggestions for future work in the area. These are focussed more on future investigation and research, rather than heritage protection, and mainly deal with themes and landscapes, rather than specific sites. The list has been circulated to relevant stakeholders (such as Anne Mason, local researcher and Chair of Friends of Thetford Forest). As many of the suggestions from Stage 1 of the project remain current, they are included again here, updated where relevant.

Suggestions for Future Work

Aerial Photograph and Lidar Assessment and Mapping

Even after the completion of Stage 2 of the Breckland AIM Project, there are still areas of the BNG lidar survey that have not been assessed. The survey comprises data for 198.25sq km, spread across several irregular and disconnected blocks. The Breckland AIM project has analysed 127sq km (64 per cent) of this data, comprising much of the larger more coherent blocks covering Thetford Forest and King's Forest. The identification of unknown, mis-located and/or partially recorded sites within the remaining 71.25sq km (36 per cent) should be seen as a priority. This includes the 18sq km covered by an earlier AIM survey (covering

Thetford and the A11 Corridor), for which no lidar was available at the time of the survey.

It would be useful to assess the aerial photographic material held by USAF Lakenheath; for example, the record for a field system recorded prior to the AIM survey (SHER BRD 039) refers to a 1970s USAF aerial photograph. An attendee at a 'Brecks from Above' talk mentioned the existence of a large collection of photographic material at Lakenheath.

Neolithic Flint Mines

Stage 1 and Stage 2 of the project both tentatively identified and/or enhanced the record for a number of sites possibly related to Neolithic flint mining. An investigation of these sites on the ground, perhaps including field walking or, where viable, geophysics, might help to throw light on the nature of the sites; they could instead be natural depressions or vegetations marks, or relate to 19th or 20th-century quarrying, or to modern vegetation management.

Bronze Age Round Barrows

The project recorded large numbers of earthwork mounds and possible round barrows, particularly in the Stage 1 area. Many had been recorded previously, but many others were new discoveries. The majority of the sites would benefit from a visit to better establish their character and record their condition. Many were recorded solely from lidar imagery, and some might be the product of the laser re-bounding from dense vegetation, rather than the presence of an earthwork. Even those sites recorded prior to the survey would benefit from further investigation, as many have not been visited for many years (or, at least, have not had a visit that has been recorded in the HERs).

More broadly, the Breckland barrows would benefit from a more holistic assessment, as a regional group. Their density, layout and variety of form has parallels with funerary landscapes recorded elsewhere, such as Salthouse Heath in north Norfolk (Albone *et al* 2007, 53-5).

Unfortunately, few, if any, of the known or possible barrows have been excavated (at least under modern conditions) and therefore establishing even relative chronologies within the group is extremely difficult. However, it would be beneficial to at least review the dating evidence – and that for contemporary activity in Breckland – to establish a baseline. It might also be possible to identify those candidates where re-use or construction in the Roman or Anglo-Saxon period is likely, or those that may have functioned as pillow mounds in Breckland's warrens.

Iron Age/Romano-British/Anglo-Saxon

Where are the sites for these periods? Stage 1 of the project identified that there is plentiful evidence from outside the forested areas (Hockwold, Brandon, Two Mile Bottom, Thetford, A11 Improvements), but relatively little from within the plantations. This trend was also seen in the Stage 2 results. Where activity is known (High Lodge, Lynford), the evidence is principally in the form of finds, any remains having presumably been levelled, or confused with evidence for later activity.

It is highly likely that Iron Age, Romano-British and Saxon populations were using the areas now under forest cover – and in particular the Little Ouse Valley – as intensively as the areas outside the forestry plantations. The fact that this is not apparent from the air photo and lidar mapping, however, means that land managers need to be aware of the potential to damage 'missing' or hidden sites, and future research needs to target this gap in knowledge.

As for other themes and periods, assessments which draw together all existing information would be beneficial in establishing baselines for specific topics. These can then be used as the springboard for future work. For example, a review of Anglo-Saxon material from the area might help identify the site of potential burials within contemporary or pre-existing round barrows.

Medieval to Post-Medieval Sites

St Helen's Church, Santon

The site was mapped as part of Stage 1 of the project (Horlock and Tremlett 2018, 39–40). It would be useful for the air photo and lidar evidence – and the mapping produced by the project – to be more closely correlated with the excavated evidence and with the 1:2,500 survey which Historic England records as being carried out in the 1970s, but which was not located by the AIM survey. Geophysical survey might help establish the location of buried masonry or other features.

Rabbit Warrens

The Stage 1 report includes a summary of the results for each rabbit warren covered in that stage; this comprised Broomhill/Weeting, Downham High, Elveden, Santon, Santon Downham and Thetford with complete or near-complete coverage, and Brandon, Eriswell, Lakenheath, Methwold and Wangford with partial coverage (Horlock and Tremlett 2018, 60–81). Stage 2 covered parts of the warrens at Methwold, Ickburgh/Langford, Culford and Eriswell (only marginally), and effectively covered Wordwell Warren in its

entirety. It added relatively little information, however, for the areas of warren it covered, partly because it covered a smaller area of warren, and because those it did cover are less well documented, and/or are not represented by distinctive earthwork boundaries, for example. Further work to link the mapping for the warrens from both stages of the project with documentary research and fieldwork would be really helpful, as this level of detailed research and data integration has been beyond the scope of the survey. Introducing some chronological depth to the boundaries and enclosures defining and within the warrens would be particularly useful; for example, identifying the various phases of activity in Downham High Warren, and interpreting when different boundaries and enclosures were in use, and what they were used for. High Lodge, which has already been the subject of a considerable amount of research and fieldwork, might be a good starting point.

The project's results, together with work by local researchers, is feeding into work looking into designating some of Breckland's warrens (Caroline Skinner, HE, pers comm). Any further information required to enhance HE's records and support the case for designation can be provided by the project team or the relevant HER.

There are warren-type enclosures outside of the 'known' warrens. Are they related to warrening or to something else?

Ridges

What is the date and origin of the blocks of ridges (reminiscent of ridge and furrow) visible on the lidar, mainly within forestry plantations? Some may be modern and related to forestry, but most of those mapped appear earlier, and have relationships with former boundaries.

Water Meadows

Possible water meadows have been identified all along the Little Ouse – not just by the survey reported on here, but also by Professor Tom Williamson (UEA). Are these all really water meadows or are some of them osier beds? Could they relate to something else instead? Documentary and cartographic research may be helpful.

Flint Mining

There are at least two distinct types of feature visible on the aerial sources at the post-medieval flint mining sites: circular pits, usually surrounded by a crescent-shaped spoil heap, and chains of pits which join up to make gullies. A possible third type – shallow, closely spaced pits – was identified by the field survey at Ling Heath (Pearson 1996), and is also visible (but not particularly distinctive)

on the aerial sources. Only the first type is fully described in the literature. Are the conjoined pits/gullies earlier features? Or do they represent a different type of mining, or a different stage in the mining process? Similarly, are the shallow pits also related to flint mining at a different time and/or using a different method of extraction, or were they created by a different process, such as the extraction of sand or gravel?

20th-Century Activity

There is lots of information relating to 20th-century activity which is visible on the photographs (and to a lesser extent the lidar), but has not been mapped or interpreted in detail, as such work falls outside the scope of the project. Others with a specialist interest in this period would be in a better position to further investigate and interpret these sites, in terms of knowledge and time/resources. The project's records define the sites (or, at least, those within scope) by extent, and give a brief summary of what is visible, and also signpost the relevant sources (usually photographs held by the Historic England Archive in Swindon). These records can be used as the starting point for a more detailed study of specific sites.

Future work could include not only military sites but other features relating to notable developments in the area – the establishment of Thetford Forest, the labour camps, the establishment (and removal) of industrial sites, and so on.

Structures visible within the forest on 1940s aerial photographs – such as huts lining forest rides – could relate to military activity or to forestry, but it is not clear which. High Lodge Labour Camp was used to house a number of organisations during and after the Second World War – boys from HM Training Ship 'Cornwall', boys from St Gilbert's Approved School, Polish forestry workers (Anne Mason, Friends of Thetford Forest, pers comm; https://highlodgeheritage.fotf.org.uk/hhhl/human_heritage/high_lodge_during_world_war_2.php) – but it has been difficult to identify features or structures relating to this on the aerial photographs. However, a researcher (or researchers) with more detailed knowledge of the documentary and oral history research, would be in a better position to address these questions.

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APPENDIX 1. METHODOLOGY

The methodology employed by the project for the most part conformed to that detailed in the Project Design (Tremlett 2016, 12-16, 45-59) and the Updated Project Design (Tremlett 2017, 13-14, 24-5). It was based on 'Standards for National Mapping Programme projects' (Winton 2015), but drew upon the prior experience of the Air Photo Interpretation Team of undertaking NMP/AIM projects in Norfolk and Suffolk.

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 usually ignored. However, where they formed part of a larger record, for example a warren boundary, or where they had been recorded by previous surveys but existing locational information was inaccurate, they were depicted in the mapping.

AIM projects are intended to provide only assessment-level data, at a nominal scale of 1:2,500. Any detail not clearly visible and comprehensible at a 1:2,500 output scale was usually omitted, eg internal features within buildings.

Plough-Levelled Features

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

Earthworks

All earthwork sites visible on the aerial photographs and/or lidar 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/lidar source. The accompanying HER database records specify which elements of earthwork groups are surviving or plough-levelled, and monument types were indexed with the evidence visible on the latest available photographs (usually the BNG lidar or Google Earth). Significant archaeological features depicted on Ordnance Survey maps, such as moats, were usually included in the mapping.

Buildings and Structures

For the most part, the mapping does not include buildings other than where these are recorded as earthworks, masonry foundations or as cropmarks or soilmarks. Standing buildings that have been destroyed were recorded where there was no other adequate record, although it is probable that a map record existed in most cases; where this was not the case, 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 baseline 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. Areas of former extraction were only mapped where they were judged to be of archaeological significance or had a bearing on surrounding sites; where such features had been recorded by previous surveys, an updated outline was recorded where required and when time allowed. Urban industrial areas were excluded from the recording, unless archaeologically significant or if they contained evidence for the provision of air raid shelters for workers, for example.

Twentieth-Century Military Archaeology

All former military sites and installations, up to and including the Cold War, which were visible on the aerial photographs and lidar 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 mapped and recorded, again to an appropriate level of detail. Small domestic air raid shelters, which are not readily visible at 1:2,500 scale, were only mapped if time allowed or their location was of particular significance.

Sites relating to post-Second World War military activity were only mapped if they related to significant activities and were characteristic of the Cold War era and strategies, ie not merely relating to general military training activities. At sites where multiple phases of 20th-century military activity were evident, a single phase was usually mapped; the air photo interpreter used their judgement as to which was the most significant and most in need of a record by

transcription. Other phases were described briefly in the descriptive record. Where Cold War features overlay a First or Second World War site, preference was usually given to the earlier site, unless the Cold War features were particularly significant and otherwise unmapped.

Coastal and Inter-Tidal Archaeology

The project area did not include any coastal or inter-tidal areas.

Post-Medieval Field Boundaries

Where post-medieval field boundaries were visible as cropmarks, earthworks or still extant on aerial photographs or lidar they were not usually plotted or recorded, in particular if they could be seen on the available Ordnance Survey mapping. If they were extensive or archaeologically significant, and/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.

Post-medieval plantation boundaries depicted on readily accessible historical maps were treated in a similar manner. However, where they formed part of a larger site (such as a warren boundary, subdivision or enclosure, for example), or where they had been recorded by previous surveys but the existing locational information was inaccurate, they were usually mapped, or included in a new or updated Monument Polygon.

Ridge and Furrow and Water Meadows

All remains of ridge and furrow were 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 was made in the HER database record.

For Stage 2, temporary mapping layers were used to indicate whether ridge and furrow sites survived as earthworks (on the latest available source) or were levelled. These will be supplied to Simon Crutchley (Historic England) for the purposes of maintaining national AIM datasets. A single layer combining both datasets will be supplied to the HERs.

Areas of water meadows were mapped to a basic level of detail, usually by extent rather than in detail.

Drainage Features

It is not within the usual scope of the AIM 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 the Historic Parks and Gardens Register maintained by Historic England, Suffolk County Council's Survey of Historic Parks and Gardens in Suffolk, and Norfolk County Council's Inventory of Parks and Gardens of Special Historic Interest. Where appropriate other parkland features, such as tree avenues, may have been mapped or, more often, a note made in the record; this was done on a site-by-site basis and decisions were inevitably influenced 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 may have been recorded where information on the aerial photographs added significant new information to the record. This was judged on a case-by-case basis, but might include evidence for public parks being used for allotments during the Second World War, or a record of a park or garden which had since been entirely redeveloped.

Transport

Major transport features, such as disused canals or main railways, were not mapped unless the evidence visible on the aerial photographs or lidar was considered to be of particular archaeological significance; in general, it is probable that such features were already adequately recorded by other sources such as historical maps. Smaller features, such as tramways or industrial railways, were recorded where they are 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.

The geology of Breckland is of considerable interest; it is particularly noteworthy for the many traces of the last glaciation still evident in its landscape. A variety of environmental factors, including geology, were taken into consideration in the analysis and interpretation undertaken by the project (summarised in this report). The constraints of the survey, however, meant that this was by necessity a relatively broad-brush approach; a more detailed analysis would almost certainly yield further insights.

Sources

Aerial Sources

The principal aerial photographic and lidar sources that were consulted by the project are summarised below.

Table 2 Principal sources consulted by the project

Collection	*Type*	*Media*
Historic England Archive (HEA)	Vertical, oblique, military oblique	Prints and digital
APGB data	colour verticals, infra-red, contour data	Digital
Norfolk County Council	Vertical, oblique	Prints
Suffolk County Council	SCCAS: oblique and vertical Suffolk Record Office: vertical	Prints and digital
Forestry England	BNG lidar, vertical photographs (only when locational information available)	Digital (lidar), prints (photographs)
Online sources	Google Earth: vertical photographs Bing Maps: vertical photographs Environment Agency: lidar	Digital

It was not possible to consult vertical and oblique prints held by Cambridge University Collection of Aerial Photography (CUCAP) as the library is currently closed. Copies of CUCAP photographs held by other collections were consulted when available.

Only a proportion of the aerial photographs held by Forestry England were supplied with any locational information. Only those prints whose location was known were consulted. For the most part, these consisted of copies of CUCAP vertical prints, the location of which could be worked out by consulting the CUCAP online catalogue.

Background Sources

The primary archival sources for the project were HER digital maps and records. HER secondary files and paper records, including grey literature reports, were not consulted as a matter of course, due to time constraints and limited accessibility (the team working remotely from the Suffolk HER, for example). Where such material was judged to be fundamental to the interpretation and recording of a site, it was consulted on a site-by-site basis. NRHE archaeological records, geology and soils maps, maps and notes from previous NMP/AIM surveys, and digitised historical Ordnance Survey maps (dating from the 1880s onwards) were consulted throughout. For Norfolk, digitised Tithe and Enclosure maps were consulted where available.

A selection of bibliographic sources were used where relevant and where time allowed. However, due to the limited resources available, such additional research took place for only a limited number of sites.

Digital Transcription

Transcription was undertaken in AutoCAD, at a nominal scale of 1:2,500. Separate drawings were created for each OS 1:10,000 quarter sheet, or equivalent mapping area. As each mapping block was completed, these were combined into a master CAD drawing, from which MapInfo exports were made.

Wherever possible, archaeological features were mapped from georectified sources, such as the BNG lidar, or from scanned images rectified in AERIAL, with control information derived from OS MasterMap (usually scale 1:1,250). Where adequate control existed, the digital terrain model function in AERIAL was used to compensate for distortion due to slope and terrain. A level of accuracy of +/- 2m should have been achieved at this scale of mapping. However, across the project area, there were frequent issues with inadequate or inaccurate control points, and at several sites a lower level of accuracy in the mapping should be anticipated. Where the mapping was affected by such problems, a note was made in the relevant HER record(s).

Rectified images were imported into AutoCAD. Archaeological features were transcribed using a project specific set of AutoCAD layers (*see* Appendix 2).

These were based upon and formatted in line with national AIM standards (Winton 2015; H Winton, Historic England, pers comm) and the output of other NMP/AIM projects in Norfolk and Suffolk. Additional layers (eg DITCH_DOUGHNUT and DITCH_FILL) were used for ease of mapping, to streamline the export process to MapInfo and to create 'filled' polygons where appropriate. Any deviations from the national AIM layer conventions were changed back to the required format in readiness for submission to the NRHE, and for submission to the HERs. The original photographic scans and rectified images will be discarded following the publication of this report.

The project used several georeferenced digital photo layers, including those held by NCC, those supplied by Suffolk County Council, APGB imagery, and online via Google Earth and Bing Maps. It also used lidar data supplied by BNG/Forestry England, or, where this was absent, EA lidar data downloadable online. (For some limited areas, no lidar data from either source was available.) 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. Lidar data was visualised using Relief Visualization Toolbox (Zakšek *et al* 2011; Kokalj and Somrak 2019), and the resulting images inserted into AutoCAD. In some instances, where the image file format did not support insertion into AutoCAD, mapping may have been undertaken in MapInfo. Given the limited time available to complete the mapping, rectifications were kept to a minimum, particularly where good vertical coverage (or other sources) showed the main components of sites. Where necessary, small amounts of additional detail were added directly to the plot by eye.

Once the mapping was complete, checks were undertaken before the 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. At the end of each mapping block, and once all database records had been added, Monument Polygons defining the extent of each site were copied to the Mon layer of the relevant HER and linked to the related database record.

Database Records

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 Monument UID, derived from the HBSMR databases, and HER Parish Code (in Suffolk) or Pref Ref (in Norfolk), derived from blocks of codes/numbers requested from the relevant HER. This data has been exported to MapInfo along with the mapping as attached Attribute Data.

Additional fields, for example 'period', 'evidence', or 'monument type', can be exported from the HER and added to the mapping as and when required. This ensured that time spent attaching Object Data to the mapping was minimised, and that any Object/Attribute data should remain up to date.

Norfolk and Suffolk HERs (ExeGesIS HBSMR)

HER Parish Codes/Pref Refs were allocated in liaison with the HER officers for each county. A record of each number used was maintained, continuing the method used for Stage 1 and for previous NMP/AIM projects in both Norfolk and Suffolk.

Records were inputted directly into the database, although individuals may have used a temporary Word document for greater ease of editing, etc, before copying and pasting text into the database. Each record includes a short written description and summary, an index of monument types and dates, evidence type, locational data, and links to sources, events and other monument records, as necessary. Once the mapping was complete and imported into the HERs, each record was linked to a Monument Polygon defining the extent of the site on the HER Mon layer. Any sensitive sites have been flagged up by the Air Photo Interpretation Team and noted in the report. Once integrated into the HERs, the data will feed directly into uploads to the Heritage Gateway, and the Norfolk and Suffolk Heritage Explorer websites, with sensitive sites handled in the same way as for the core HER data.

Upon request, and once a suitable transfer mechanism is in place, copies of the mapping and records will be exported to the NRHE.

Event Records

A parent Event Record for the whole project has been created in each HER. Event Records for each mapping block were also created, and sometimes for subdivisions of the block into mapping areas, within a linked hierarchy. These 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. Event Records at the lowest level of the hierarchy are linked to all associated monument records.

Progress Sheets

Formal progress sheets for each quarter sheet/mapping area were not kept, but team members were able to use a checklist of sources to ensure that all had been referred to. Registers of Parish Codes/Pref Refs for new and amended sites were

maintained for each county, 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 timesheet. Information on areas completed, time taken and numbers of new and amended records was included in quarterly progress reports to HE. Information required for the archive has been or will be transferred to the relevant Event record, and/or included in the Archaeological Report or Closure Report, or will form part of the Project Management file.

Reports and Publications

Archaeological Report

This is the last of three reports written to quantify and assess the results of the project. The first, funded by the Heritage Lottery Fund, summarised the results for the 'Brecks from Above' project, covering Mapping Block 1 and 54 per cent of Block 2. The second, funded by Historic England, updated the 'Brecks from Above' report with the results from the remainder of Block 2, and amended it to conform with AIM Standards. It was also formatted for publication as part of the Historic England Research Report Series. This final report covers the results from Mapping Blocks 3 and 4, as well as providing an overview and assessment of the results from the project area as a whole. The reports are intended to summarise the main chronological trends and the character of the archaeological sites and landscapes recorded; to highlight any significant and/or sensitive sites and provide a synthesis of the results of the mapping and interpretation, assessing its significance in the context of both the county and the region; and to make recommendations for future work, including further aerial reconnaissance, ground truthing and ground survey, and publication.

A list of sites which might benefit from further heritage protection measures, including potential candidates for designation, is included as Appendix 3. A list of potential updates to the NHLE is also included, as Appendix 4. These will both be submitted to Historic England, Suffolk County Council and Norfolk County Council.

Data Access and Copyright

This report is copyright Historic England. All AIM transcriptions and associated records are copyright Norfolk County Council. A perpetual non-exclusive royalty-free licence to use and/or sub-licence the project archive and all other project materials for any purpose is granted to Historic England. A licence is granted to Suffolk County Council to use, reproduce and distribute maps and records for the Suffolk portion of the project area. The provision of the mapping

and records to other users by Norfolk County Council and Suffolk County Council will be subject to a series of existing data agreements for using HER data. Within the Brecks from Above area, Norfolk County Council grants BNG and the HLF permission to freely use samples and images of project outputs (ie maps and records) in their own publicity and interpretation.

Storage, Data Exchange and Archiving

All photographic material on loan from the HEA, Suffolk County Council and Forestry England was stored in a locked fire-proof cupboard within the Norfolk Air Photo Library, which is itself locked and alarmed. HEA photographs were loaned on a rolling programme, and held according to their terms and conditions.

Provisionally, all digital mapping and recording data was stored on the Norfolk County Council Environment Team shared drive for the duration of the project. The exported data is stored within the Norfolk and Suffolk HERs, as part of their ExeGesIS HBSMR databases and GIS data. Responsibility for storage and access lies with the HERs; the Air Photo Interpretation Team has retained copies of the data for reference purposes. Copies of the mapping and database records will be provided to the NRHE upon request and once a suitable transfer mechanism is in place.

A copy of the finalised report will be supplied to Historic England, to be made available as part of their Research Report Series.

All other project data (report files, management and administration documents, etc) have been (or will be) rationalised before archiving on the Norfolk County Council network (where appropriate, copies will be provided to Suffolk County Council and Historic England on request).

APPENDIX 2. MAPPING LAYERS AND OBJECT/ATTRIBUTE DATA

Continuing the methodology used for Stage 1 of the Breckland AIM, and previous projects in Suffolk, object/attribute data was confined to the Mon UID and Parish Code/Pref Ref. If required, additional fields can be added as an update from the HERs, thus minimising the time spent on this task during mapping and ensuring that any attached data is up to date.

Table 3 Mapping layers used by the project

Layer name	*AutoCAD object type*	*AutoCAD colour*	*AutoCAD linetype*	*Description*	*Permanent/ temporary?*	*MapInfo layer name*	*MapInfo object type and style*
BANK	Closed polyline (wide or area feature) or open polyline (narrow feature <2m wide)	Red (1)	Continuous	Used to outline positive features (banks, platforms, mounds, etc), drawing a polygon to define wide or area features, but using a single line for narrow features <2m wide. NB. Historic England guidance required enclosures defined by a narrow (<2m wide) bank to be mapped as a narrow 'doughnut'. These were mapped on the BANK_DOUGHNUT layer.	Permanent	AIM_BANK	Region fill: pattern E2 (dots), foreground E1 (Red), no background Region border: style B1 (continuous line), colour E1 (red), width pixels = 1 Polyline: as for region border

Layer name	*AutoCAD object type*	*AutoCAD colour*	*AutoCAD linetype*	*Description*	*Permanent/ temporary?*	*MapInfo layer name*	*MapInfo object type and style*
BANK_ DOUGHNUT	Closed polyline	Red (1)	Continuous	As for BANK but used to outline positive features (banks, platforms, mounds, etc) which form a 'doughnut' shape when mapped. Variations in software and export processes cause these to be filled in different ways in GIS, so objects were exported separately to GIS for editing.	Merged with BANK in MapInfo	AIM_BANK	N/A (added to AIM_BANK layer)
BANK_FILL	Hatch	Red (1)	Dots (scale 2.25, angle 53 degrees)	Used to fill BANK and BANK_DOUGHNUT objects in AutoCAD, if required (eg for printing).	Temporary as not required in MapInfo where outline layers can be filled automatically.	N/A	N/A
DITCH	Closed polyline (wide or area feature) or open polyline (narrow feature <2m wide)	Green (3)	Continuous	Used to outline negative/cut features: ditches, ponds, pits, hollow ways, etc, drawing a polygon to define wide or area features, but using a single line for narrow features <2m wide. NB. Historic England guidance required enclosures defined by a narrow (<2m wide) ditch (eg narrow ring ditches) to be mapped as a narrow 'doughnut'. These were mapped on the DITCH_DOUGHNUT layer.	Permanent	AIM_DITCH	Region fill: pattern B1 (solid), foreground G1 (green), no background Region border: style B1 (continuous line), colour G1 (green), width pixels = 1 Polyline: as for region border

Layer name	*AutoCAD object type*	*AutoCAD colour*	*AutoCAD linetype*	*Description*	*Permanent/ temporary?*	*MapInfo layer name*	*MapInfo object type and style*
DITCH_ DOUGHNUT	Closed polyline	Green (3)	Continuous	As for DITCH but used to outline negative/cut features (ditches, ponds, pits, hollow ways, etc) which form a 'doughnut' shape when mapped. Variations in software and export processes cause these to be filled in different ways in GIS, so objects were exported separately to GIS for editing.	Merged with DITCH in MapInfo	AIM_DITCH	N/A (added to AIM_DITCH layer)
DITCH_ FILL	Hatch	Green (3)	Solid	Used to fill DITCH and DITCH_DOUGHNUT objects in AutoCAD, if required (eg for printing).	Temporary as not required in MapInfo where outline layers can be filled automatically	N/A	N/A
EXTENT_ OF_ FEATURE	Closed polyline	Orange (30)	Dashed x 2	Used to depict the extent of large area features such as airfields, military camps, or major extraction.	Permanent	AIM_ EXTENT_ OF_ FEATURE	Region fill: none Region border: style A3 (dashed line), colour D9 (orange), width pixels = 1
GRID	Line	White	Continuous	Used to draw grid at 1km intervals across map sheet.	Temporary (no longer required by HE)	N/A (not exported)	N/A

Layer name	*AutoCAD object type*	*AutoCAD colour*	*AutoCAD linetype*	*Description*	*Permanent/ temporary?*	*MapInfo layer name*	*MapInfo object type and style*
HER_ MONUMENT _UID	Text	Yellow (2)	Arial at height 20	Used to annotate mapping with HER Mon UID number, eg MSF27212.	Temporary, used only if required for mapping, illustrations, etc.	N/A (not exported)	N/A
HER_PARISH _CODE [Suffolk], HER_PREF _REF [Norfolk]	Text	Yellow (2)	Arial at height 20	Used to annotate mapping with HER reference number: in Suffolk, HER parish code, eg SOL 030; in Norfolk, HER Pref Ref, eg 26437.	Temporary, used only if required for mapping, illustrations, etc.	N/A (not exported)	N/A
MAP	Image	White	N/A	Used for OS 1:10,000 base maps.	Temporary	N/A (not exported)	N/A
MONUMENT _POLYGON	Closed polyline	White	Continuous	Used to indicate the extent of the monument record as defined in the Monument database. NB. Two temporary layers - MONUMENT_POLYGON_ NEW and MONUMENT_ POLYGON_AMENDED used for initial mapping, to aid transfer of data to HERs. However, all data moved onto this layer for final exports and archive.	Permanent	AIM_ MONUMENT _POLYGON	Region fill: none Region border: style B1 (continuous line), colour D1 (black), width pixels = 1 Does not need to be displayed with AIM mapping, as should be replicated by/subsumed within HER Mon layer

Layer name	*AutoCAD object type*	*AutoCAD colour*	*AutoCAD linetype*	*Description*	*Permanent/ temporary?*	*MapInfo layer name*	*MapInfo object type and style*
MONUMENT_POLYGON_AMENDED	Closed polyline	White	Continuous	Temporary layer used to indicate the extent of the monument record for Amended Records as defined in the Monument database. Required to facilitate transfer of Monument Polygons to HERs. NB. All data to transferred to MONUMENT_POLYGON layer for final exports and archive.	Temporary	N/A (temporary export)	Region fill: none Region border: style B1 (continuous line), colour D1 (black), width pixels = 1
MONUMENT_POLYGON_NEW	Closed polyline	White	Continuous	Temporary layer used to indicate the extent of the monument record for New Records as defined in the Monument database. Required to facilitate transfer of Monument Polygons to HERs. NB. All data transferred to MONUMENT_POLYGON layer for final exports and archive.	Temporary	N/A (temporary export)	Region fill: none Region border: style B1 (continuous line), colour D1 (black), width pixels = 1
NOTES	Various	Magenta (6)	Continuous	Used for mapping notes to archive in working drawing.	Permanent in working drawing but retained in 'clean' AutoCAD drawing and not exported. In Suffolk, some annotations may be suitable for transfer to POSSIBLES	N/A (not exported)	N/A

Layer name	*AutoCAD object type*	*AutoCAD colour*	*AutoCAD linetype*	*Description*	*Permanent/ temporary?*	*MapInfo layer name*	*MapInfo object type and style*
PITS_ QUARRIES	Closed polyline	Blue (5)	Continuous	Used for areas of former extraction. NB. Such areas usually fell outside the scope of this NMP/AIM project.	Permanent (requested by Suffolk County Council and used by previous NMP/AIM projects in Suffolk)	AIM_PITS_ QUARRIES	Region fill: none Region border: style B1 (continuous line), colour I1 (blue), width pixels = 1
POSSIBLES	Various	Various	Various	Used by previous NMP/AIM projects in Suffolk for notes and sketches of features of uncertain archaeological significance.	Permanent. Requested by Suffolk County Council and used by previous NMP/AIM projects in Suffolk; can be used for information usually left on NOTES layer	AIM_ POSSIBLES	Non-standard layer with no defined style, objects remain as exported from AutoCAD
RIDGE_AND _FURROW_ ALIGNMENT	Open polyline	Cyan (4)	Continuous	Line or arrow(s) (hand drawn not a symbol) depicting the direction of the rigs in a block of ridge and furrow.	Permanent	AIM_RIDGE_ AND_ FURROW_ ALIGNMENT	Polyline: style B1 (continuous line), colour H1 (cyan), width pixels = 1

Layer name	*AutoCAD object type*	*AutoCAD colour*	*AutoCAD linetype*	*Description*	*Permanent/ temporary?*	*MapInfo layer name*	*MapInfo object type and style*
RIDGE_AND_FURROW_ALIGNMENT_EW	Open polyline	Cyan (4)	Continuous	Temporary layer used to indicate alignment of ridge and furrow surviving as earthworks. Required by HE to maintain national datasets. NB. All data transferred to RIDGE_AND_FURROW_ALIGNMENT for final exports and archive.	Temporary	N/A (temporary export)	Polyline: style B1 (continuous line), colour H1 (cyan), width pixels = 1
RIDGE_AND_FURROW_ALIGNMENT_LEW	Open polyline	Cyan (4)	Continuous	Temporary layer used to indicate alignment of ridge and furrow that has been levelled. Required by HE to maintain national datasets. NB. All data transferred to RIDGE_AND_FURROW_ALIGNMENT for final exports and archive.	Temporary	N/A (temporary export)	Polyline: style B1 (continuous line), colour H1 (cyan), width pixels = 1
RIDGE_AND_FURROW_AREA	Closed polyline	Cyan (4)	Dot x 2	Used to outline a block of ridge and furrow.	Permanent	AIM_RIDGE_AND_FURROW_AREA	Region fill: none Region border: style D1 (dotted line), colour H1 (cyan), width pixels = 1
RIDGE_AND_FURROW_AREA_EW	Closed polyline	Cyan (4)	Dot x 2	Temporary layer used to indicate outline of ridge and furrow surviving as earthworks. Required by HE to maintain national datasets. NB. All data transferred to RIDGE_AND_FURROW_AREA for final exports and archive.	Temporary	N/A (temporary export)	Region fill: none Region border: style D1 (dotted line), colour H1 (cyan), width pixels = 1

Layer name	*AutoCAD object type*	*AutoCAD colour*	*AutoCAD linetype*	*Description*	*Permanent/ temporary?*	*MapInfo layer name*	*MapInfo object type and style*
RIDGE_AND_FURROW_AREA_LEW	Closed polyline	Cyan (4)	Dot x 2	Temporary layer used to indicate outline of ridge and furrow that has been levelled. Required by HE to maintain national datasets. NB. All data transferred to RIDGE_AND_FURROW_AREA for final exports and archive.	Temporary	N/A (temporary export)	Region fill: none Region border: style D1 (dotted line), colour H1 (cyan), width pixels = 1
STRUCTURE	Closed polyline (wide or area feature) or open polyline (narrow feature <2m wide)	Purple (200)	Continuous	Used to outline structures including stone, concrete, metal and timber constructions eg buildings, Nissen huts, tents, radio masts, camouflaged airfields, wrecks, fish traps, etc. NB. Historic England guidance required enclosures defined by narrow (<2m wide) structures (eg an unbroken blast wall) to be mapped as a narrow 'doughnut'. These were mapped on the STRUCTURE_DOUGHNUT layer.	Permanent	AIM_STRUCTURE	Region fill: pattern B1 (solid), foreground P1 (purple), no background Region border: style B1 (continuous line), colour P1 (purple), width pixels = 1 Polyline: as for region border

Layer name	*AutoCAD object type*	*AutoCAD colour*	*AutoCAD linetype*	*Description*	*Permanent/ temporary?*	*MapInfo layer name*	*MapInfo object type and style*
STRUCTURE_ DOUGHNUT	Closed polyline	Purple (200)	Continuous	As for STRUCTURE but used to outline structures (stone, concrete, metal and timber constructions, etc) which form a 'doughnut' shape when mapped, eg a continuous blast wall. Variations in software and export processes cause these to be filled in different ways in GIS, so objects were exported separately to GIS for editing.	Merged with STRUCTURE in MapInfo	AIM_ STRUCTURE	N/A (added to AIM_ STRUCTURE layer)
STRUCTURE _FILL	Hatch	Purple (200)	Line (scale 0.75, angle 60 degrees)	Used to fill STRUCTURE and STRUCTURE_ DOUGHNUT objects in AutoCAD, if required (eg for printing).	Temporary as not required in MapInfo where outline layers can be filled automatically.	N/A	N/A

APPENDIX 3. RECOMMENDATIONS FOR HERITAGE PROTECTION AND FURTHER WORK (STAGE 2)

Potential candidates for designation assessment are listed in bold type. Detailed information – accurate mapping of form and extent, written interpretation and indexing, references for aerial photographs and other sources, information on survival, and so on – is recorded for each site in the HER database for the relevant county. The database records include a link to existing designation records where applicable.

Much of the heathland and forestry plantations covered by the project contain surviving earthworks of various kinds, in particular boundary banks, trackways, enclosures and mounds. While individually, many of these sites are of relatively low archaeological importance, they have considerable group value as a record of the changing use of the Brecks over time. Further survey and investigation, to ensure the continued survival of the earthworks that have historically been protected by the plantations or heathland, to better record and understand them, and to locate any as yet undetected remains, would clearly be of benefit. Similarly, in the more open landscape of the Wissey, Little Ouse and Lark valleys, the project has recorded large areas of medieval settlement. Although now largely (but not wholly) levelled, these sites again have significant group value, in particular given the scarcity of such extensive medieval settlement remains in the region.

At the same time, the potential for buried, pre-medieval archaeological sites to exist undetected within the same heathland and forestry areas must also be kept in mind. Even those levelled or buried sites that have been recorded are usually poorly understood and their extent unknown. While the earthworks surviving on the Brecks are clearly of considerable significance in the local and regional context, the necessity of protecting and investigating the still 'hidden' pre-medieval archaeology of Breckland's plantations and heaths should not be forgotten.

The table below lists recommendations for sites recorded during Stage 2 of the project; *see* Horlock and Tremlett (2018, appendix 3) for recommendations relating to Stage 1 sites.

Table 4 Recommendations for heritage protection and further work

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*Parish*	*Description*	*Condition / Evidence*	*Comments / Recommendations*
MNF68065	NHER 61154	Cranwich	Possible Neolithic flint mine.	Muted earthworks of pits, which could be Neolithic but could equally relate to more recent extraction of sand, gravel or marl. Numerous Neolithic worked flints have been recovered from the vicinity (NHER 11233 & 11232, for example).	In addition to recorded earthworks and finds, sub-circular vegetation marks are visible on recent colour aerial photographs (Google Earth, APGB). Further investigation of the area, for example using geophysics, might help identify any additional features of potential Neolithic date.

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*Parish*	*Description*	*Condition / Evidence*	*Comments / Recommendations*
MNF71146	**NHER 63072**	**Cranwich**	**Earthworks and cropmarks relating to Cranwich medieval settlement.**	**The majority of the earthworks were levelled by the 1970s, however earthworks still survive in good condition to the north of the church (centred at TL 7822 9513), visible on the EA (2017) 2m lidar data.**	**Ground survey of surviving earthworks and synthesis with AIM mapping, finds records and documentary evidence required to gain a better understanding of the site. Use of higher resolution lidar data or drone survey as well as a field visit and earthwork survey to accurately record the surviving earthworks to the north of the church (centred at TL 7822 9513). Geophysical survey could be undertaken to try to locate any building remains and possibly extend the site further than the AIM mapping. Systematic fieldwalking and targeted excavation might be beneficial, undertaken with the aim of trying to phase and date the elements of the medieval settlement. The site is an excellent example of medieval to post-medieval settlement in the Wissey Valley, and further work would not only enhance knowledge of the site but would provide important contextual information for medieval settlement in the wider area. Pending further investigation of any surviving earthworks, designation might be a consideration.**

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*Parish*	*Description*	*Condition / Evidence*	*Comments / Recommendations*
MSF28538	**SHER CUL 052**	**Culford**	**A large undated oval enclosure, possibly of prehistoric or post-medieval date. If the latter, it could be associated with military activity.**	**A large undated oval enclosure can be seen as an earthwork on aerial photographs and visualised EA lidar data.**	**Further investigation such as field visits and geophysics would possibly help to understand the date and function of the enclosure further. Pending further research into the date and function of the site, the site might be considered for potential designation, given the excellent condition of the earthworks.**
MNF71080	NHER 62603	Didlington	Possible Second World War spigot mortar emplacement	Mound with central depression visible as an earthwork on visualised lidar data from 2015 BNG survey.	Further investigation in the field has the potential to reveal structural elements relating to the emplacement, such as the remains of a pedestal. This could confirm (or not) the interpretation of this feature, as well as being a significant element of the site, worthy of preservation/recording in its own right.
MNF71088	NHER 62610	Didlington	Possible Second World War spigot mortar emplacement, within embanked/fenced enclosure	Mound with central depression visible as an earthwork on visualised lidar data from 2015 BNG survey. The enclosure appears to have been removed/levelled.	Further investigation in the field has the potential to reveal structural elements relating to the emplacement, such as the remains of a pedestal. This could confirm (or not) the interpretation of this feature, as well as being a significant element of the site, worthy of preservation/recording in its own right.

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*Parish*	*Description*	*Condition / Evidence*	*Comments / Recommendations*
MSF38655	**SHER IKL 352**	**Icklingham**	**Multiple areas of probable First World War training trenches.**	**The trenches can be seen as cropmarks and low earthworks on aerial photographs and visualised lidar data.**	**There is presently (January 2020) limited lidar data available covering Berner's Heath and the First World War training trenches. The 2015 BNG lidar, which does cover some of the eastern trenches, has revealed that some features survive as low earthworks. Lidar data which covers the entire site should be analysed when available to better record the preservation of the trenches. Given the significance of the Elveden training area for the development of the tank, and the apparent survival of earthworks, this site is potentially a candidate for designation.**
MSF38671	SHER IKL 368	Icklingham	A group of small undated mounds.	A group of small undated mounds can be seen as earthworks on aerial photographs and visualised BNG lidar data.	Further investigation, such as a field visit, would help to understand the date and function of these features better. The principal question to answer is whether the mounds could be small Bronze Age barrows or modern features.

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*Parish*	*Description*	*Condition / Evidence*	*Comments / Recommendations*
MNF30470	NHER 30470	Lynford	Earthworks within Lynford Hall park.	The earthworks under woodland (centred at TL 8183 9359) are in better condition than the earthworks in the lawn area (centred at TL 8192 9362) which survive as low earthworks. The majority of the features show well on the 2015 BNG lidar, some were the subject of field visits in 2014.	Although a large number of earthworks have been mapped and recorded from field visits and the AIM survey, there is little synthesis of these results. The earthwork remains, documentary evidence and records need to be analysed together, to help try to understand the relationship between the earthworks and the old hall, current hall and the possible deserted medieval settlement remains. Further analysis of the BNG lidar data should also be undertaken for the areas of the park that fall outside of the Breckland AIM project area.
MNF71440	NHER 63330	Lynford	Possible Bronze Age round barrow cemetery	Possible Bronze Age round barrow cemetery, comprising up to five possible mounds (NHER 63331-63335). Earthworks on 2015 BNG lidar.	Site visit to better establish existence, archaeological significance and condition of earthworks.

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*Parish*	*Description*	*Condition / Evidence*	*Comments / Recommendations*
MNF63613, MNF71408, MNF71474, MNF71849, MNF71848, MNF71850	NHER 57837, 63337, 63338, 62024, 63258, 63339	Lynford, Mundford, Weeting-with-Broomhill	Probable 20th-century military practice trenches. Unusual plan form, and mainly under woodland cover by mid-1940s, they appear to be pre-Second World War, and could feasibly date from the territorial manoeuvres held in Breckland in 1906, 1911 and 1912.	All survive at least partially as earthworks, visible on 2015 BNG lidar.	Further documentary research might reveal useful information about these sites, while site visit would be beneficial to better assess their condition and character.
MNF24628	NHER 24628	Methwold	Probable Bronze Age round barrow.	Visible as earthwork on imagery from BNG lidar survey flown in 2015. North-east side truncated by forest ride.	Take action to prevent further damage to mound by use of ride. NB. The location of this site has been corrected as a result of the AIM mapping.

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*Parish*	*Description*	*Condition / Evidence*	*Comments / Recommendations*
MSF38413	SHER WSW 157	West Stow	A possible enclosure consisting of a bank with a possible exterior ditch. It is undated but may be a post-medieval plantation enclosure.	The possible enclosure is roughly D-shaped, with two possible sections of an exterior ditch on its northern side. The enclosure is visible as an earthwork on visualised BNG lidar data.	Further investigation of the enclosure, such as a field visit, would possibly help to understand the date and function of the enclosure further.

APPENDIX 4. POTENTIAL UPDATES TO THE NATIONAL HERITAGE LIST FOR ENGLAND (STAGE 2)

The table below covers only those sites within the Stage 2 project area. *See* the Stage 1 report (Horlock and Tremlett 2018, appendix 4) for designated sites within the Stage 1 project area.

Table 5 Potential updates to the NHLE

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*NHLE No. (source: NHLE dataset)*	*Legacy UID. (source: NHLE dataset)*	*Current NGR (source: NHLE dataset)*	*Description (source: NHLE dataset)*	*Scheduled Area on NHLE Accurate?*	*Condition*	*Comments / Recommendations*
MSF11047	SHER CUL 022	1001363	3173	TL 82838 70738	CULFORD PARK	Yes	N/A	No specific recommendations.
MNF30470	NHER 30470	1000224	1132	TL 81931 93542	LYNFORD HALL	Yes	N/A	No specific recommendations.

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*NHLE No. (source: NHLE dataset)*	*Legacy UID. (source: NHLE dataset)*	*Current NGR (source: NHLE dataset)*	*Description (source: NHLE dataset)*	*Scheduled Area on NHLE Accurate?*	*Condition*	*Comments / Recommendations*
MNF1089	NHER 1089	1004040	NF 51	TL 75845 89709	Devil's Dyke (Fossdyke or Fendyke)	No. As stated for Stage 1, the extent of the NHLE mapping, although mostly accurate, does not fully reflect the extent of the site as mapped by the project.	Within the Stage 1 area the feature is principally visible as an earthwork on the 2015 BNG lidar. This includes earthwork elements that are not included in the NHLE Scheduled Area. The bank is relatively complete throughout TL79 NE and TL79 SE with some of the bank presumably levelled and fragmented around TL 7679 9427. There are also some small areas where the bank has been levelled for forestry access.	The Scheduled Area could be revised to better reflect the AIM mapping, in particular to include those sections visible as earthworks on the 2015 lidar data. *See also* Stage 1 updates (Horlock and Tremlett, 127).
MNF4992	NHER 4992	1015254	21422	TL 75899 91073	Bowl barrow in Lynnroad Covert, 870m south-east of Heath Farm	No (*see* Stage 1 updates, Horlock and Tremlett 2018, 128).	Earthwork on 2015 BNG lidar survey (*see* Stage 1 updates).	Scheduled Area needs to be amended to correlate with AIM mapping (*see* Stage 1 updates).

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*NHLE No. (source: NHLE dataset)*	*Legacy UID. (source: NHLE dataset)*	*Current NGR (source: NHLE dataset)*	*Description (source: NHLE dataset)*	*Scheduled Area on NHLE Accurate?*	*Condition*	*Comments / Recommendations*
MNF56930	NHER 51529	1015259	21429	TL 76980 91049	Bowl barrow on Bunker's Hill, 650m west of Pilgrims' Walk	Uncertain, *see* Stage 1 updates, Horlock and Tremlett 2018, 130).	Not identified on the aerial sources; *see also* Stage 1 updates.	*See* Stage 1 updates.
MNF71932	NHER 63630	1015260	21430	TL 77623 91520	Bowl barrow in Mount Ephraim Plantation, 770m north-west of Field Barn	Yes	Earthwork clearly visible on visualised data from 2015 BNG lidar survey.	None.
MNF11522 (pond barrow), MNF71915 (bowl barrow)	NHER 11522 (pond barrow), 63631 (bowl barrow)	1015261	21431	TL 77516 91453	Bowl barrow and pond barrow in Mount Ephraim Plantation, 810m north-west of Field Barn	No. Minor discrepancies between Scheduled Area and features as mapped by AIM survey.	Earthwork clearly visible on visualised data from 2015 BNG lidar survey.	Amend Scheduled Area to better correlate with AIM mapping.

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*NHLE No. (source: NHLE dataset)*	*Legacy UID. (source: NHLE dataset)*	*Current NGR (source: NHLE dataset)*	*Description (source: NHLE dataset)*	*Scheduled Area on NHLE Accurate?*	*Condition*	*Comments / Recommendations*
MNF4996	NHER 4996	1015262	21432	TL 77356 91366	Wayside cross known as Stump Cross in Mount Ephraim Plantation	Not known as not readily identifiable on consulted sources and not mapped by survey.	Not known.	None.
MSF10054, MSF10055	SHER IKL 004, IKL 005	1016808	31118	TL 79089 75391	Five bowl barrows 590m north-east of Bernersfield Farm	Yes, but only two easternmost barrows recorded by the survey (others lay too far outside project area).	Only two easternmost barrows recorded by survey. IKL 004 is situated within an area of woodland. The barrow can be seen in between the trees on the August 2007 Google Earth layer but it is difficult to tell the condition of the barrow in any detail due to the forestry canopy. IKL 005 can be seen on the APGB aerial photographs as a low earthwork surrounded by a possible fence or strip of land within an arable field.	Presently (July 2019) there is no lidar coverage for the site; however, the National Lidar Programme dataset from the EA should provide coverage for this area in the future. This data should be analysed to provide further information on the preservation of the barrows.

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*NHLE No. (source: NHLE dataset)*	*Legacy UID. (source: NHLE dataset)*	*Current NGR (source: NHLE dataset)*	*Description (source: NHLE dataset)*	*Scheduled Area on NHLE Accurate?*	*Condition*	*Comments / Recommendations*
MSF7013	SHER ELV 002	1018044	31101	TL 82108 77268	Bowl barrow known as John Mann's Clump	No.	The barrow is in good condition and can be seen as an earthwork on recent (2016) aerial photographs.	Scheduled Area needs to be extended to the north to fit with the position of the feature as recorded from the aerial photographs.
MSF6963	SHER WSW 013	1018101	31117	TL 80611 72923	Bowl barrow in the King's Forest, 1.3km north-east of Wideham Barn	Yes.	The barrow seems to be in good condition on the recent (July 2018) Google Earth images. A small amount of vegetation can be seen over the site on the July 2018 Google Earth image and a possible trackway can be seen cutting the feature on the 2015 BNG visualised lidar data.	The barrow can be seen well as an earthwork on the sources consulted as part of this project. The earthwork mound and ditch are seen best on the BNG 2015 visualised lidar data.

HER Mon UID	*HER Pref Ref (Norfolk) or Parish Code (Suffolk)*	*NHLE No. (source: NHLE dataset)*	*Legacy UID. (source: NHLE dataset)*	*Current NGR (source: NHLE dataset)*	*Description (source: NHLE dataset)*	*Scheduled Area on NHLE Accurate?*	*Condition*	*Comments / Recommendations*
MSF10090	SHER IKL 028	1018102	31119	TL 78978 74627	Bowl barrow 510m south-east of Bernersfield Farm	Yes	The barrow seems to be in good conditions on the recent 2018 Google Earth imagery.	Presently (August 2019) there is no lidar coverage for the site; however, the National Lidar Programme dataset from the EA should provide coverage for this area in the future. This data should be analysed to provide further information on the preservation of the barrow.
MSF7091	SHER CUL 003	1020717	31087	TL 83650 71317	Bowl barrow known as Hill of Health, Brockley Corner	Yes.	The barrow can be seen clearly as an earthwork on the 2m visualised EA lidar and is presumed to be in good condition. The feature is obscured by trees on the recent aerial photographs, making it difficult to assess the condition accurately.	The barrow can be seen clearly on the 2m EA visualised lidar data and is obscured by tree cover on the aerial photographs consulted as part of this project.

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